## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>SCHEDULE AT A GLANCE</td>
</tr>
<tr>
<td>07</td>
<td>REASONS TO ATTEND</td>
</tr>
<tr>
<td>08</td>
<td>CONFERENCE OVERVIEW</td>
</tr>
<tr>
<td>12</td>
<td>APPY HOUR</td>
</tr>
<tr>
<td>14</td>
<td>ART GALLERY</td>
</tr>
<tr>
<td>16</td>
<td>ART PAPERS</td>
</tr>
<tr>
<td>19</td>
<td>BUSINESS SYMPOSIUM</td>
</tr>
<tr>
<td>21</td>
<td>COMPUTER ANIMATION FESTIVAL ELECTRONIC THEATER</td>
</tr>
<tr>
<td>23</td>
<td>COURSES</td>
</tr>
<tr>
<td>28</td>
<td>EDUCATOR’S FORUM</td>
</tr>
<tr>
<td>30</td>
<td>EMERGING TECHNOLOGIES</td>
</tr>
<tr>
<td>34</td>
<td>PANELS</td>
</tr>
<tr>
<td>37</td>
<td>PRODUCTION SESSIONS</td>
</tr>
<tr>
<td>39</td>
<td>REAL-TIME LIVE!</td>
</tr>
<tr>
<td>41</td>
<td>STUDIO</td>
</tr>
<tr>
<td>44</td>
<td>TALKS</td>
</tr>
<tr>
<td>50</td>
<td>TECHNICAL PAPERS</td>
</tr>
<tr>
<td>69</td>
<td>VIRTUAL, AUGMENTED AND MIXED REALITY</td>
</tr>
<tr>
<td>72</td>
<td>VR THEATER</td>
</tr>
<tr>
<td>73</td>
<td>ACM SIGGRAPH ORGANIZATION EVENTS</td>
</tr>
<tr>
<td>75</td>
<td>ACM SIGGRAPH THEATER EVENTS</td>
</tr>
<tr>
<td>77</td>
<td>EXHIBITION</td>
</tr>
<tr>
<td>78</td>
<td>EXHIBITOR MEETING ROOMS AND SESSIONS</td>
</tr>
<tr>
<td>80</td>
<td>JOB FAIR</td>
</tr>
<tr>
<td>81</td>
<td>GENERAL INFORMATION</td>
</tr>
<tr>
<td>83</td>
<td>CONFERENCE COMMITTEE</td>
</tr>
</tbody>
</table>

### CURATED CONTENT

SIGGRAPH 2019 offers several events and sessions that are individually chosen by program chairs to address specific topics in computer graphics and interactive techniques.

Curated content is not selected through the regular submissions process or comprehensive jury, however it is reviewed by subject matter experts.

### ADAPTABLE TECHNOLOGY

Accessibility is an integral part of SIGGRAPH. Every day, virtual, augmented, and mixed reality, as well as other new applications, inform the field with new possibilities that transform and enhance lives. Look for this graphic throughout the Advance Program for content on Adaptive Technology.

### INTEREST AREAS

SIGGRAPH brings together a wide variety of professionals who approach computer graphics and interactive techniques from different perspectives.

Our programs and events align with five broad interest areas (listed below). Use these interest areas to help guide you through the content at SIGGRAPH 2019.
Full Conference One Day registration is available. Includes admission to conference programs and events for the day purchased and the Exhibition (Tuesday-Thursday). It does NOT include Computer Animation Festival - Electronic Theater or Reception.

<table>
<thead>
<tr>
<th>Event</th>
<th>Saturday 27 July</th>
<th>Sunday 28 July</th>
<th>Monday 29 July</th>
<th>Tuesday 30 July</th>
<th>Wednesday 31 July</th>
<th>Thursday 1 August</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGISTRATION</td>
<td>5:00 PM–7:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–5:35 PM</td>
</tr>
<tr>
<td>GEEK BAR</td>
<td>8:30 AM–8:00 PM</td>
<td>8:30 AM–5:35 PM</td>
<td>8:30 AM–7:45 PM</td>
<td>8:30 AM–8:00 PM</td>
<td>8:30 AM–5:35 PM</td>
<td>8:30 AM–5:35 PM</td>
</tr>
<tr>
<td>ATTENDEE LOUNGE</td>
<td>8:30 AM–8:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–7:45 PM</td>
<td>8:30 AM–8:00 PM</td>
<td>8:30 AM–5:35 PM</td>
<td>8:30 AM–5:35 PM</td>
</tr>
<tr>
<td>MERCHANDISE PICKUP CENTER/ SIGGRAPH STORE</td>
<td>5:00 PM–7:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–6:00 PM</td>
<td>8:30 AM–3:30 PM</td>
<td>8:30 AM–3:30 PM</td>
</tr>
<tr>
<td>OPENING CEREMONY AND AWARDS PRESENTATIONS</td>
<td></td>
<td></td>
<td></td>
<td>9:00 AM–10:30 AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACM SIGGRAPH AWARD TALKS</td>
<td></td>
<td></td>
<td></td>
<td>3:45 PM–5:15 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACM SIGGRAPH DIVERSITY AND INCLUSION SUMMIT</td>
<td></td>
<td></td>
<td></td>
<td>8:40 AM–5:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACM SIGGRAPH FRONTIERS TALKS</td>
<td></td>
<td></td>
<td></td>
<td>8:00 AM–8:45 AM</td>
<td>8:00 AM–8:45 AM</td>
<td>8:00 AM–8:45 AM</td>
</tr>
<tr>
<td>ACM SIGGRAPH FRONTIERS WORKSHOPS</td>
<td></td>
<td></td>
<td></td>
<td>9:00 AM–5:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACM STUDENT RESEARCH COMPETITION</td>
<td></td>
<td></td>
<td></td>
<td>3:45 PM–5:15 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPY HOUR</td>
<td></td>
<td></td>
<td></td>
<td>5:00 PM–7:00 PM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**KEY**

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)
<table>
<thead>
<tr>
<th>Event</th>
<th>Saturday 27 July</th>
<th>Sunday 28 July</th>
<th>Monday 29 July</th>
<th>Tuesday 30 July</th>
<th>Wednesday 31 July</th>
<th>Thursday 1 August</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART GALLERY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ART PAPERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIRDS OF A FEATHER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ALL WEEK</td>
</tr>
<tr>
<td>BUSINESS SYMPOSIUM</td>
<td>2:30 PM–7:00 PM</td>
<td>9:30 AM–2:30 PM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMPUTER ANIMATION FESTIVAL – ELECTRONIC THEATER</td>
<td>1:30 PM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td></td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–3:30 PM</td>
<td></td>
</tr>
<tr>
<td>COMPUTER ANIMATION FESTIVAL – VR THEATER KIOSKS</td>
<td>1:30 PM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td></td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–3:30 PM</td>
<td></td>
</tr>
<tr>
<td>COURSES</td>
<td>9:00 AM–5:15 PM</td>
<td>9:00 AM–5:15 PM</td>
<td>9:00 AM–5:15 PM</td>
<td>9:00 AM–5:15 PM</td>
<td>9:00 AM–5:15 PM</td>
<td></td>
</tr>
<tr>
<td>EDUCATORS FORUM</td>
<td>3:30 PM–5:00 PM</td>
<td>8:30 AM–5:15 PM</td>
<td>8:30 AM–5:15 PM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMERGING TECHNOLOGIES</td>
<td>1:30 PM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–3:30 PM</td>
<td></td>
</tr>
<tr>
<td>EXHIBITION SHOW FLOOR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXHIBITOR SESSIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPERIENCE PRESENTATIONS</td>
<td>2:00 PM–5:15 PM</td>
<td>10:45 AM–12:15 PM AND 3:45 PM–5:15 PM</td>
<td>9:00 AM–5:15 PM</td>
<td>9:00 AM–12:15 PM</td>
<td>9:00 AM–12:15 PM</td>
<td></td>
</tr>
<tr>
<td>INTERNATIONAL CENTER</td>
<td>9:00 AM–6:00 PM</td>
<td>9:00 AM–6:00 PM</td>
<td>9:00 AM–6:00 PM</td>
<td>9:00 AM–6:00 PM</td>
<td>9:00 AM–3:30 PM</td>
<td></td>
</tr>
</tbody>
</table>

**KEY**

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Business Symposium (B)
- Exhibits (E)
- Exhibitors (EX)
- Experiences (XP)
<table>
<thead>
<tr>
<th>Event</th>
<th>Saturday 27 July</th>
<th>Sunday 28 July</th>
<th>Monday 29 July</th>
<th>Tuesday 30 July</th>
<th>Wednesday 31 July</th>
<th>Thursday 1 August</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOB FAIR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEYNOTE SESSION</td>
<td></td>
<td></td>
<td>2:00 PM–3:15 PM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANELS</td>
<td>3:45 PM–5:15 PM</td>
<td>10:45 AM–12:15 PM AND 3:45 PM–5:15 PM</td>
<td>9:00 AM–12:15 PM</td>
<td>9:00 AM–12:15 PM</td>
<td>2:00 PM–3:30 PM</td>
<td></td>
</tr>
<tr>
<td>PATHFINDERS</td>
<td>4:30 PM–7:00 PM</td>
<td>8:00 AM–3:00 PM</td>
<td>8:00 AM–3:00 PM</td>
<td>8:00 AM–12:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POSTERS</td>
<td>1:30 PM–5:30 PM</td>
<td>9:30 AM–6:00 PM</td>
<td>9:30 AM–6:00 PM</td>
<td>9:30 AM–6:00 PM</td>
<td>9:30 AM–3:30 PM</td>
<td></td>
</tr>
<tr>
<td>POSTER SESSIONS</td>
<td>12:15 PM–1:15 PM</td>
<td>12:15 PM–1:15 PM</td>
<td>12:15 PM–1:15 PM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRODUCTION GALLERY</td>
<td>11:30 AM–5:30 PM</td>
<td>9:00 AM–5:30 PM</td>
<td>9:00 AM–5:30 PM</td>
<td>9:00 AM–2:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRODUCTION SESSIONS</td>
<td>3:45 PM–5:15 PM</td>
<td>10:45 AM–12:15 PM AND 2:00 PM–5:15 PM</td>
<td>10:45 AM–12:15 PM AND 2:00 PM–8:00 PM</td>
<td>10:45 AM–12:15 PM AND 2:00 PM–5:15 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REAL-TIME LIVE!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6:00 PM–7:45 PM</td>
</tr>
<tr>
<td>RECEPTION</td>
<td>8:00 PM–10:00 PM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUDIO</td>
<td>1:30 PM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–3:30 PM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**KEY**

**REGISTRATION LEVELS**
- ● Full Conference Platinum (FP)
- ★ Full Conference One-Day (FOD)
- ○ Full Conference (F)
- ◊ Select Conference (S)
- ▲ Experiences (XP)
- ◆ Exhibits (E)
- ◊ Exhibitors (EX)
- ● Business Symposium (B)
<table>
<thead>
<tr>
<th>Event</th>
<th>Saturday 27 July</th>
<th>Sunday 28 July</th>
<th>Monday 29 July</th>
<th>Tuesday 30 July</th>
<th>Wednesday 31 July</th>
<th>Thursday 1 August</th>
</tr>
</thead>
<tbody>
<tr>
<td>TALKS</td>
<td>9:00 AM–5:15 PM</td>
<td>3:45 PM–5:15 PM</td>
<td>9:00 AM–5:15 PM</td>
<td>9:00 AM–10:30 AM AND 2:00 PM–3:30 PM</td>
<td>9:00 AM–5:15 PM</td>
<td></td>
</tr>
<tr>
<td>TECHNICAL PAPERS</td>
<td>10:45 AM–12:15 PM</td>
<td>9:00 AM–5:35 PM</td>
<td>9:00 AM–5:35 PM</td>
<td>9:00 AM–5:35 PM</td>
<td>9:00 AM–5:35 PM</td>
<td></td>
</tr>
<tr>
<td>TECHNICAL PAPERS FAST FORWARD</td>
<td>6:00 PM–8:00 PM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIRTUAL, AUGMENTED AND MIXED REALITY</td>
<td>1:30 PM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–5:30 PM</td>
<td>10:00 AM–3:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VR THEATER SCREENINGS*</td>
<td>1:15 PM** 2:15 PM** 3:15 PM** 4:15 PM**</td>
<td>8:45 AM 9:45 AM 10:45 AM 11:45 AM 1:45 PM 2:45 PM 3:45 PM</td>
<td>8:45 AM 9:45 AM 10:45 AM 11:45 AM 1:45 PM 2:45 PM 3:45 PM</td>
<td>8:45 AM 9:45 AM 10:45 AM 11:45 AM 1:45 PM 2:45 PM 3:45 PM</td>
<td>8:45 AM 9:45 AM 10:45 AM 12:45 PM 1:45 PM</td>
<td></td>
</tr>
</tbody>
</table>

*Computer Animation Festival - VR Theater Ticketing

VR Theater Screenings are available to Full Conference Platinum and Full Conference attendees only. Tickets will be distributed at the VR Theater Ticket desk in Registration one day before each showing (i.e., Monday tickets are available on Sunday, Tuesday tickets on Monday, etc.).

** On Sunday, 28 July, the VR Theater is for Full Conference Platinum Registrants only.

Note: For all other attendee levels, kiosks will be set up for individual viewings of select VR Theater content throughout the Experience Hall. (Stay tuned for updates on this offering.)
Reasons to Attend

WHY ATTEND?

For over 40 years, SIGGRAPH has been the place to gather knowledge and spark collaboration between diverse disciplines—because our vast, robust industry becomes stronger and healthier when leaders converge.

Learn

From visual effects and animation technology to VR and game design, SIGGRAPH 2019 offers courses, talks, and panels that make for a crash course in the latest research and techniques.

Create

Fuel your creativity with cutting-edge tools when you demo the latest in mixed reality or new technologies in the Experience Hall, and then create works of art, whether functional or novel, in the Studio.

Discover

At the exhibition, explore the latest technology that’s changing the workplace for CG and VFX professionals, and throughout the conference see how visionaries are pushing positive change with presentations of adaptive technologies.

Connect

Join artists, researchers, students, and pioneers who come from all over the world to forge bonds between ideas—and each other. SIGGRAPH provides many fun networking opportunities that foster creative relationships between passionate people.
CONFERENCE OVERVIEW

SIGGRAPH 2019 is a five-day immersion into the latest innovations in computer graphics, animation, VR and AR, games, digital art, emerging technologies, and more. Experience research, hands-on demos, and inspiring acts of collaboration alongside fellow creatives, intellects and innovators.

One-Day Registration

Full Conference One-Day registration is available. It includes one-day admission to conference programs, events, and experiences as well as the exhibition (Tuesday-Thursday). It does not include access to the Business Symposium, Electronic Theater or a Reception ticket. For more information, visit www.siggraph.org/about/awards

OPENING CEREMONY AND AWARDS PRESENTATIONS

Monday, 29 July, 9 AM-10:30 AM

ACM SIGGRAPH 2019 Award Recipients

The Steven Anson Coons Award for Outstanding Creative Contributions to Computer Graphics
Michael F. Cohen
Facebook

The Computer Graphics Achievement Award
Denis Zorin
Courant Institute of Mathematical Sciences, New York University

ACM SIGGRAPH Outstanding Service Award
Jackie White

The Significant New Researcher Award
Wenzel Jakob
École Polytechnique Fédérale de Lausanne (EPFL)

The Distinguished Artist Award for Lifetime Achievement in Digital Art
Donna Cox
University of Illinois

The Outstanding Doctoral Dissertation Award
Lingqi Yan
University of California, Berkeley

Honorable Mentions
Angela Dai
Stanford University
Hao Su
Stanford University
Adriana Schulz
MIT

ACM SIGGRAPH Practitioner Award
Stephen Hill
Lucasfilm

The Distinguished Educator Award
Andries (Andy) van Dam
Brown University

ACM SIGGRAPH Academy Inductees
Fred Brooks
Marie-Paule Cani
Markus Gross
Dinesh Manocha
Ravi Ramamoorthi
Hanen Samet

ACM SIGGRAPH AWARD TALKS

Monday, 29 July, 3:45 PM-5:15 PM

The Awards Talks give award recipients the opportunity to share their research and backgrounds.

ACM SIGGRAPH FRONTIERS

The ACM SIGGRAPH Frontiers program showcases perspectives on emerging and adjacent areas of interest to the SIGGRAPH community.
ACM STUDENT RESEARCH COMPETITION 
FINAL PRESENTATION

Student posters are selected for judging at SIGGRAPH 2019. A panel of distinguished judges views the SRC posters during the poster sessions and selects 6-8 of the semi-finalists – one group of undergraduate submissions, and one group of graduate submissions – who present their work to SIGGRAPH 2019 attendees. The competition is sponsored by Microsoft.

APPY HOUR

Test drive the latest mobile app creations and share feedback with the independent developers who created them. Got mobile app creations of your own? Don't leave them at home.

ART GALLERY

The SIGGRAPH Art Gallery offers a space for creative contemplation. In light of shifting ecological, political, social, and global-relations climates, artists examine the present and consider the question, “What can we do?”

ART PAPERS

The SIGGRAPH Art Papers program brings together communities of researchers and practitioners working at the intersections of art, design, humanities, science, and technology.

BIRDS OF A FEATHER (BOF)

Shared interests bring SIGGRAPH attendees together for graphics-related, attendee-organized, informational Birds of a Feather sessions. For an updated list of the Birds of a Feather sessions visit: https://s2019.siggraph.org/conference/programs-events/birds-of-a-feather/

BUSINESS SYMPOSIUM

Join fellow industry professionals and production leaders for networking and exploration of trending and future technologies that will change the way we do business. The Business Symposium will take place at the L.A. Grand Hotel Downtown on Saturday, 27 July and Sunday, 28 July.

COMPUTER ANIMATION FESTIVAL 
ELECTRONIC THEATER

(MONDAY, 29 JULY ONLY)

The Computer Animation Festival celebrates computer graphics as a medium for storytelling in animation, visual effects, games, and more. Thanks to advances in CG technology, the ways in which we can tell our stories keep expanding, and those stories resonate in ever more impactful ways.

COURSES

Broaden your understanding of foundational and cutting-edge techniques in SIGGRAPH Courses. Beginners and experts alike explore the breadth of computer graphics and interactive techniques.

EDUCATOR'S FORUM

Those who do, teach. SIGGRAPH 2019’s Educator’s Forum aims to inspire those who teach, from K-12 through undergraduate and graduate programs, with ideas from industry, research, and academia.

EMERGING TECHNOLOGIES

Always first in line? In Emerging Technologies, catch the very latest game-changing tech designed to help us thrive.

EXHIBITION

At the SIGGRAPH Exhibition, you’re invited to check out the newest hardware systems, software tools, and creative services from hundreds of companies. Slip on dazzling VR/AR/MR goggles, get your hands on the stylus of the latest animation tool, and much more.

KEY

REGISTRATION LEVELS

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)
EXHIBITOR SESSIONS
- SIGGRAPH 2019 exhibitors demonstrate their software, hardware, and systems, and answer questions about how their applications improve professional and technical performance.

EXPERIENCE PRESENTATIONS
- Informal presentations on new ideas that are applicable to techniques, concepts, and strategies related to the Experience Hall (Art Gallery, Emerging Technologies, Studio and Immersive Pavilion) programs.

For a complete list, visit [https://s2019.siggraph.org/conference/programs-events/experience-presentations/](https://s2019.siggraph.org/conference/programs-events/experience-presentations/)

INTERNATIONAL RESOURCE CENTER
- The SIGGRAPH International Center exists for our international visitors, offering a place for attendees to meet, collaborate, and learn from one another.

JOB FAIR
- The SIGGRAPH 2019 Job Fair is the best place to forge relationships with recruiters from the industry's top companies. Join us 30-31 July 2019.

KEYNOTE SESSION
Monday, 29 July, 2-3:15 PM

Victoria Alonso
Executive Vice President of Production, Marvel Studios

A bold, creative leader, Alonso has the experience to speak to the evolution of the industry on a variety of levels. In a fireside chat, Alonso will explore what successful storytelling in the digital age looks like, speak to the challenges and importance of encouraging diversity, give advice for successful leadership, and share her insights on the future of interactive technology.

PANELS
- Lively discussion amongst leading experts in computer graphics and interactive techniques serves up diverse perspectives for consideration and inspiration.

POSTERS
- Posters is an ideal venue for new researchers to share their theories and innovations with peers and collaborators. Fascinating new content generates discussion, feedback, and inspiration.

POSTER PRESENTATIONS
- An opportunity for Poster contributors to discuss their work with attendees.

PRODUCTION GALLERY
- This one-of-a-kind exhibit recognizes the art, processes, and physical materials involved in the creation of major studio projects — not just the final piece on screen. The gallery features artwork, props, costumes, and more from recent film, VR, or game productions.

PRODUCTION SESSIONS
- Industry leaders demonstrate breakthroughs in visual effects, animation, VR/AR/MR, games, themed entertainment, architecture, scientific visualization, and platforms we haven’t yet dreamed of.

REAL-TIME LIVE!
- Real-Time Live! celebrates the top jury-reviewed interactive novelties of the year. Enjoy the excitement of a live event treating you to a sampling of what's new in real-time.

RECEPTION
Monday, 29 July, 8-10 PM @ L.A. Live
- The SIGGRAPH 2019 reception will take place at L.A. Live, just a short walk from the Los Angeles Convention Center. Connect with fellow researchers, scientists, artists, and entrepreneurs for an evening of celebration and networking.
**STUDIO**

The Studio is a place to come and try out all the amazing technology and experiment with the ideas that surround us at SIGGRAPH. Sit down and create something, learn something, and collaborate. Let’s play!

**VIRTUAL, AUGMENTED AND MIXED REALITY**

Immersive technologies are changing the ways we create, play, learn, communicate, and interact. Experience first-hand the latest and greatest advances in VR, AR, and MR at SIGGRAPH.

**TALKS**

Thought leaders gather at the SIGGRAPH Talks to share ideas and advances on key topics in computer graphics and interactive techniques.

**VR THEATER**

The VR Theater showcases the best of the best in virtual reality short-form narratives to highlight and celebrate the evolution of a new medium.

**TECHNICAL PAPERS**

Hear from a wide range of scientists and researchers who drive the industry, inspire new work, and ignite memorable discussions. This is the kind of content you’ll reflect on, and refer to, all year.

**TECHNICAL PAPERS FAST FORWARD**

The world’s leading experts in computer graphics and interactive techniques preview the Technical Papers in provocative, sometimes hilarious summaries of the field’s evolution.
Discover anything and everything a mobile device can do at Appy Hour. Whether it’s augmented reality, high-end mobile gaming, computational photography, image manipulation, location-based gaming, content creation, you’ll likely find it here. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/appy-hour/

APPPY HOUR

Discover anything and everything a mobile device can do at Appy Hour. Whether it’s augmented reality, high-end mobile gaming, computational photography, image manipulation, location-based gaming, content creation, you’ll likely find it here. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/appy-hour/

HOURS

Wednesday, 31 July, 5 PM-7 PM

AIRE - VISUALIZE AIR QUALITY
Research & Education
Natalia Garcia Torres
Paulina Escalante Campbell
Quimera Verde

ARCALVR: AUGMENTED REALITY PLAYGROUND ON MOBILE DEVICES
Research & Education
Menghe Zhang
Weichen Liu
Karen Lucknalalai
Kamran Alipour
Jurgen Schulze
University of California, San Diego

NIRA - VIEW, REVIEW, AND PRESENT GBYTES SIZED ASSETS ON ANY DEVICE WITH INTERACTIVE RENDERING ON ANY DEVICE
Research & Education
Arash Keissami
dRaster, Inc.; Nira.app

PLAYGAMI: AUGMENTED REALITY ORIGAMI CREATIVITY PLATFORM
Gaming & Interactive
Yosun Chang
AReality3D; Permute.xyz

REALITY: AVATAR BROADCAST YOUR VIRTUAL BEING FROM EVERYWHERE
New Technologies
Akihiko SHIRAI
GREE, Inc.; GREE VR Studio Lab

SUR.FACED.IO
Gaming & Interactive
Yosun Chang
AReality3D; Permute.xyz

UBEBOB - VOICE-DRIVEN, PERSONALIZED, AVATAR-BASED COMMUNICATIVE VIDEO CONTENT IN A/R
New Technologies
Ari Shapiro
Anton Leuski
Embody Digital

VIVID: DEPICTING DYNAMICS IN STYLIZED LIVE PHOTOS
Gaming & Interactive
Amir Semmo
Hasso Plattner Institute for Digital Engineering gGmbH

REALITY: AVATAR BROADCAST YOUR VIRTUAL BEING FROM EVERYWHERE
New Technologies
Akihiko SHIRAI
GREE, Inc.; GREE VR Studio Lab

SUR.FACED.IO
Gaming & Interactive
Yosun Chang
AReality3D; Permute.xyz

TSUNAMI!
Gaming & Interactive
Derek Jacoby
Yvonne Coady
Eric Dahl
Andy Wynden
Matt Richardson
University of Victoria

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
- P&A Production & Animation
- R&E Research & Education
- A&D Arts & Design
- G&I Gaming & Interactive
- NT New Technologies

RETURN TO TABLE OF CONTENTS

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
XPLORO

G&A  NT

Chris Ebeling
Matt Estela
Daniel Flood
Benjamin Skinner
Andrew Bluff

UTS Animal Logic Academy


MONDAY NIGHT @ LIVE

Monday, 29 July

Electronic Theater: 6:30 PM-8:35 PM @ Microsoft Theater
Reception: 8 PM-10 PM @ Xbox Plaza at L.A. Live

The Computer Animation Festival Electronic Theater is one night only and one unforgettable experience. Join us at Microsoft Theater as we celebrate computer graphics as a medium for storytelling in animation, visual effects, games, and more. Take a picture with Pixel, enjoy captivating creations, and head over to the Reception afterwards to continue the fun.
The SIGGRAPH 2019 Art Gallery is pleased to announce the return to a juried exhibition, with this year’s theme being, “Proliferating Possibilities: Speculative Futures in Art and Design.” What solutions might we need to thrive in a future full of promise and unknowns? For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/art-gallery/

### RECEPTION: LEONARDO, ART PAPERS, AND ART GALLERY
Tuesday, 30 July, 2 PM-3:30 PM

Mix and mingle with artists, researchers, and authors whose works were selected for SIGGRAPH 2019. Meet the Leonardo team and members of the SIGGRAPH 2019 committee. Sponsored by Leonardo/ISAST and The MIT Press. MIT Press.

### EYES

| A&D | Yoon Chung Han  
San Jose State University |
|-----|----------------|
|     | Praful Surve  
California State University, Fullerton |

### FIBER OPTIC OCEAN

| A&D | Ozge Samanci  
Northwestern University |
|-----|----------------|
|     | Adam Snyder  
Electronic Arts |
|     | Gabriel Caniglia  
Northwestern University |

### LEONARDO

A special issue of Leonardo, The Journal of the International Society of the Arts, Sciences and Technology includes visual documentation of the works exhibited in the Art Gallery. Publication of this special issue coincides with SIGGRAPH 2019.

### ART GALLERY HOURS

- Sunday, 28 July, 1:30 PM-5:30 PM
- Monday, 29 July, 10 AM-5:30 PM
- Tuesday, 30 July, 10 AM-5:30 PM
- Wednesday, 31 July, 10 AM-5:30 PM
- Thursday, 1 August, 10 AM-3:30 PM

### EYES

<table>
<thead>
<tr>
<th>A&amp;D</th>
</tr>
</thead>
</table>
| Yoon Chung Han  
San Jose State University |
| Praful Surve  
California State University, Fullerton |

<table>
<thead>
<tr>
<th>FIBER OPTIC OCEAN</th>
</tr>
</thead>
</table>
| Ozge Samanci  
Northwestern University |
| Adam Snyder  
Electronic Arts |
| Gabriel Caniglia  
Northwestern University |

### KEYS

<table>
<thead>
<tr>
<th>Full Conference Platinum (FP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Conference One-Day (FOD)</td>
</tr>
<tr>
<td>Full Conference (F)</td>
</tr>
<tr>
<td>Select Conference (S)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTEREST AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&amp;A Production &amp; Animation</td>
</tr>
<tr>
<td>R&amp;E Research &amp; Education</td>
</tr>
<tr>
<td>A&amp;D Arts &amp; Design</td>
</tr>
<tr>
<td>G&amp;I Gaming &amp; Interactive</td>
</tr>
<tr>
<td>NT New Technologies</td>
</tr>
</tbody>
</table>

### RETURN TO TABLE OF CONTENTS

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
KNOWING TOGETHER
A&D
Rosalie Yu
Columbia University; The Brown Institute for Media Innovation, Columbia Graduate School of Journalism

Charles Berret
University of British Columbia, School of Journalism

LAVIN
A&D
Jieliang Luo
Media Arts & Technology, University of California, Santa Barbara; Autodesk Research

Weidi Zhang
University of California, Santa Barbara

NOISE AQUARIUM
A&D
Victoria Vesna
University of California, Los Angeles

Martina R. Fröschl
University of Applied Arts Vienna

Glenn Bristol
United Motion Labs

Alfred Vendli
University of Applied Arts Vienna

PACHINKO MACHINE
A&D
Brigitta Zics
UCL Knowledge Lab

ROBOTIC VOICE ACTIVATED WORD KICKING MACHINE
A&D
Neil Mendoza
Neil Mendoza Studio

RUSHI
A&D
John Wong
John Wong Art

TENTACLE FLORA
A&D
Akira Nakayasu
Kobe Design University

TRANSVISION: EXPLORING THE STATES OF THE VISUAL FIELD IN THE AGE OF EXTREME AUGMENTATION
A&D
Jiabao Li
Honghao Deng
Panagiotis Michalatos
Harvard University

WATERTIGHT
A&D
Ziv Schneider
Raycaster, NYU ITP

Caitlin Robinson
Electric South

THE YAWN CHORUS
A&D
Alex Rothera
Humane Engineering, Google

Christopher G. Thompson
Independent

Christopher Baker
School of the Art Institute of Chicago

Shek Po Kwan
Independent

INTEREST AREAS
P&A Production & Animation
R&E Research & Education
A&D Arts & Design
G&I Gaming & Interactive
NT New Technologies
The SIGGRAPH Art Papers program explores innovative and provocative projects in a self-reflective manner: multiple views or entry points, multicultural translation, and multigenerational communication. For content descriptions, visit [https://s2019.siggraph.org/conference/programs-events/art-papers/](https://s2019.siggraph.org/conference/programs-events/art-papers/)

**Best Art Paper Award**

The Best Art Paper Award recognizes excellence in contributions to the literature on digital arts, computer graphics, and/or interactive techniques. The winner will be announced during the Spaces, Territories, Perception session, Tuesday, 30 July, 10:45 AM-12:15 PM.

**RECEPTION: LEONARDO, ART PAPERS, AND ART GALLERY**

Tuesday, 30 July, 2 PM-3:30 PM

Mix and mingle with artists, researchers, and authors whose works were selected for SIGGRAPH 2019. Meet the Leonardo team and members of the SIGGRAPH 2019 committee. Sponsored by Leonardo/ISAST and The MIT Press.

**LEONARDO**

In collaboration with Leonardo/ISAST, the Long Art Papers are published in a special issue of *Leonardo, The Journal of the International Society of the Arts, Sciences and Technology*.

The issue also includes visual documentation of the works exhibited in the Art Gallery. Publication of this special issue coincides with SIGGRAPH 2019.
**TUESDAY, 30 JULY**

**SPACES, TERRITORIES, PERCEPTION**

10:45 AM-12:15 PM

**A&D NT**

**CAVE: Making Collective Virtual Narrative**

Kris Layng  
Ken Perlin  
*New York University / Courant, Parallux*

Corrine Brenner  
*New York University*

Sebastian Herscher  
*New York University / Courant, Parallux*

Thomas Meduri  
*New York University / Courant, VRNOVO*

---

**Terra Mars: When Earth Shines on Mars Through AI’s Imagination**

Weili Shi  
*Bluecadet, LLC*

---

**Learning to See. You Are What You See.**

Memo Akten  
Rebecca Fiebrink  
*Goldsmiths, University of London*

Mick Grierson  
*University of the Arts, London*

---

**DIGITAL TOOLS, ARCHIVES, MEMORIES**

3:45 PM-5:15 PM

**A&D**

**Secrets of Balanced Composition as Seen Through a Painter’s Window: Visual Analyses of Paintings Based on Subset Barycenter Patterns**

Jin Wan Park  
*Chung-Ang University*

---

**Off-Lining to Tape Is Not Archiving: Why We Need Real Archiving to Support Media Archaeology and Ensure Our Visual Effects Legacy Thrives**

Evanthia Samaras  
Andrew Johnston  
*University of Technology Sydney*

---

**WEDNESDAY, 31 JULY**

**3D PRINT, DESIGN, INSTALLATIONS**

10:45 AM-12:15 PM

**A&D**

**Weaving Objects: Spatial Design and Functionality of 3D Woven Textiles**

Claire Harvey  
Emily Holtzman  
*Rhode Island School of Design, TEAM Inc.*

Joy Ko  
*Brooks Hagan  
Rhode Island School of Design*

Rundong Wu  
Steve Marschner  
*Cornell University*
WEDNESDAY, 31 JULY

The Trained Particles Circus: Dealing With Attractors, Automatons, Ghosts, and Their Shadows
Patxi Araujo
University of Basque Country

Knowing Together
Rosalie Yu
Columbia University; The Brown Institute for Media Innovation, Columbia Graduate School of Journalism
Charles Berret
University of British Columbia, School of Journalism

Air Hugs: A Large-Scale Interactive Installation
Rachel Dickey
University of North Carolina Charlotte

No in Disguise: Algorithmically Targeted Conversations About Sexual Consent in a Multimedia Art Installation
Simon Boas
University of California, Santa Cruz

DOWNLOAD THE MOBILE APP
Available via 📱 Apple App Store 📱 Google Play

Connect with attendees and contributors, plan your week and navigate the conference — all in one place! Download the official SIGGRAPH 2019 mobile app today to get started.
A valid confirmation ID is required to access login-only features. These include: syncing favorites across devices, in-app networking game, submitting session feedback, and posting to the Activity Feed. All other features are available without a login.
The Business Symposium is designed to provide opportunities for interaction and networking, and covers topics of importance to senior managers who want to know how emerging technologies shape and affect business. The symposium will feature keynote speakers and panels on Entertainment Production and Delivery, Cybersecurity, Healthcare Innovation and Diversity and Equity. For session descriptions, visit https://s2019.siggraph.org/conference/programs-events/business-symposium/

Session Topics *(Schedule subject to change)*

**SUNDAY, 27 JULY**

**REMARKS AND WELCOME**

2:30 PM

**OPENING KEYNOTE: THINK LIKE A (F)UTURIST**

2:45 PM-3:30 PM

Philip Lelyvedt  
USC Entertainment Technology Center, School of Cinematic Arts Entertainment Technology Research

**PANEL: DIGITAL TECHNOLOGIES AND THEIR APPLICATION TO ENTERTAINMENT PRODUCTION AND DELIVERY**

3:35 PM-4:40 PM

**FIRESIDE CHAT: DIVERSITY AND EQUITY AS BUSINESS IMPERATIVES**

4:45 PM-5:30 PM

Lauren McCallum  
Mill Film

Sarah Juma  
Innovate Inclusion

Natalie Rountree  
SIGGRAPH 2019 Adaptive Technology Co-chair

**RECEPTION**

5:30 PM-7 PM

**SUNDAY, 28 JULY**

**WELCOME AND SUMMARY OF DAY 1**

10:00 AM

**PANEL: VIRTUAL MEDICINE: INTERACTIVE TECHNOLOGY AND HEALTHCARE DELIVERY**

10:15 AM-11 AM

Frances A. Aryalasomayajula  
Global Healthcare Solutions, HP

Diane Gromala  
Pain Studies Lab, Simon Fraser University

Dirk Reiners  
University of Arkansas at Little Rock

Howard Rose  
Firsthand Technology

**PANEL: CYBERSECURITY – THREATS TO BUSINESS FROM EMERGING TECHNOLOGIES**

11:05 AM-11:50 AM

Vlad Gheorghiu  
softwareQ Inc.

Veronica (Vern) Wendt  
National Defense University

Brian Romansky  
Owl Cyber Defense

**KEYS**

<table>
<thead>
<tr>
<th>REGISTRATION LEVELS</th>
<th>Full Conference Platinum (FP)</th>
<th>Full Conference One-Day (FOD)</th>
<th>Full Conference (F)</th>
<th>Select Conference (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experiences (XP)</td>
<td>Exhibits (E)</td>
<td>Exhibitors (EX)</td>
<td>Business Symposium (B)</td>
</tr>
</tbody>
</table>

**INTEREST AREAS**

- **P&A** Production & Animation
- **R&E** Research & Education
- **A&D** Arts & Design
- **G&I** Gaming & Interactive
- **NT** New Technologies

#SIGGRAPH2019  |  S2019.SIGGRAPH.ORG
SUNDAY, 28 JULY

LUNCH
12 PM-1 PM

CLOSING KEYNOTE: CLASH!
HOW TO MAKE DIVERSITY
YOUR SUPERPOWER
1:15 PM-2 PM

Alana Conner
Instagram
High-tech projection of the finest achievements in animated feature and short films, games, advertising, visual effects, real-time effects, real-time graphics, scientific illustration, and scientific visualization. Lineup is subject to change. For content descriptions and an updated list, visit https://s2019.siggraph.org/conference/programs-events/computer-animation-festival/electronic-theater/

Full Conference Platinum and Full Conference registration levels include an Electronic Theater ticket. All other levels may add a ticket for an additional fee during the registration process.

**ALITA: BATTLE ANGEL**
Eric Saindon
Weta Digital (New Zealand)

**BEST FRIEND**
Nicholas Olivieri
GOBELINS, l’école de l’image (France)

**“BIRTH OF PLANET EARTH” FULLDOME EXCERPT: PHOTOSYNTHESIS IN A CHROMATOPHORE**
Donna Cox
Advanced Visualization Lab, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign (United States)

**THE BOLT CONNECTION**
Nicolas Lebas
Supinfocom Rubika (France)

**EXpedition Reef for Educators**
Ryan Wyatt
California Academy of Sciences (United States)

**GAME CHANGER**
Aviv Mano
Ringling College of Art and Design (United States)

**HEDGEGOOG**
Vaibhav Keswani
GOBELINS, l’école de l’image (France)

**ILM 2019 – BEHIND THE MAGIC**
Brent Segura-Bowers
Industrial Light & Magic (Canada, Singapore, United States, United Kingdom)

**KINKY KITCHEN**
Bea Hoeller
Filmakademie Baden-Württemberg GmbH, Animationsinstitut (Germany)

**THE MAKING OF “HOW TO TRAIN YOUR DRAGON: THE HIDDEN WORLD”**
Dave Walvoord
DreamWorks Animation (United States)

**MAROONED**
Andrew Erekson
DreamWorks Animation (United States)

**MAYDAY – FINAL CHAPTER**
Muh Chen
Grass Jelly Studio (Taiwan)

**NASA SURVEYS HURRICANE DAMAGE TO PUERTO RICO’S FORESTS**
Alex Kekesi
GST, Inc. - NASA/Goddard Space Flight Center (United States)

**OLD SOLDIER**
Marc Messenger
Blizzard Entertainment (United States)

**THE OSTRICH POLITIC**
Mohammad Houhou
GOBELINS, l’école de l’image (France)
PASSAGE
Igor Coric
Artrake (Serbia)

PURL
Kristen Lester
Pixar Animation Studios (United States)

SHARE YOUR GIFTS
Buck
Buck & TBWA\Media Arts Lab (United States)

SPIDER-MAN: INTO THE SPIDER-VERSE
Danny Dimian
Sony Pictures Imageworks (United States)

THE HERETIC (PART 1)
Veselin Efremov
Unity Technologies (Denmark)

THE STAINED CLUB
Mélanie Lopez
Supinfocom Rubika (France)

STUFFED
Elise Simoulin
Supinfocom Rubika (France)

THE TREE
Basil Malek-Abudamdan
GOBELINS, l’ecole de l’image (France)

WILD LOVE
Maryka Laudet
MegaComputeur, Ecole des Nouvelles Images (France)

LET’S CELEBRATE: RECEPTION
Monday, 29 July, 8-10 pm @ Xbox Plaza at L.A. Live

The SIGGRAPH 2019 reception will take place at L.A. Live, just a short walk from the Los Angeles Convention Center. Connect with fellow researchers, scientists, artists, and entrepreneurs for an evening of celebration and networking.

Ticket required for entrance.
SIGGRAPH 2019 Courses offer SIGGRAPH attendees the chance to develop their understanding of CG and interactive techniques. For experts wishing to give back and share their knowledge, Courses are a unique opportunity to present material to an engaged and responsive audience.

Seating is on a first-come, first-served basis. Please arrive early for the course you wish to attend. Visit the Courses page to see the full descriptions: https://s2019.siggraph.org/conference/programs-events/courses/

SUNDAY, 28 JULY

OPENVDB
9 AM-10:30 AM
Research & Education
Level: Intermediate
Moderator
Ken Museth
Weta Digital
Lecturers
Nick Avramoussis
DNEG
Dan Bailey
ILM Vancouver

ARE WE DONE WITH RAY TRACING?
9 AM-12:15 PM
Research & Education
Level: Advanced
Moderator
Alexander Keller
NVIDIA
Lecturers
Timo Viitanen
NVIDIA
Colin Barré-Brisbois
Electronic Arts
Christoph Schied
Facebook Reality Labs
Morgan McGuire
NVIDIA

DEEP LEARNING: A CRASH COURSE
9 AM-12:15 PM
New Technologies
Level: Beginner
Lecturer
Andrew Glassner
The Imaginary Institute

PERCEPTION OF VIRTUAL CHARACTERS
2 PM-3:30 PM
New Technologies
Level: Beginner
Moderator
Rachel McDonnell
Trinity College Dublin
Lecturers
Eduard Zell
Katja Zibrek
Trinity College Dublin

COMPUTATIONAL FABRICATION
9 AM-12:15 PM
Research & Education
Level: Intermediate
Lecturers
Wojciech Matusik
MIT
Adriana Schulz
University of Washington

KEYS
REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
- Production & Animation
- Research & Education
- Arts & Design
- Gaming & Interactive
- New Technologies
- Adaptive Tech

#SIGGRAPH2019   S2019.SIGGRAPH.ORG
## SUNDAY, 28 JULY

### A DEEP DIVE INTO UNIVERSAL SCENE DESCRIPTION AND HYDRA

**2 PM-5:15 PM**

**Level:** Intermediate

**Moderator:**
- George ElKoura
- Sebastian Grassia
- Pixar Animation Studios

**Lecturers:**
- Sunya Boonyatera
- Pol Jeremias-Vila
- Matt Kuruc
- Alex Mohr
- Pixar Animation Studios

### INTRODUCTION TO REAL-TIME RAY TRACING

**2 PM-5:15 PM**

**Level:** Beginner

**Lecturers:**
- Peter Shirley
- Chris Wyman
- NVIDIA
- Morgan McGuire
- NVIDIA, University of Waterloo

### MONDAY, 29 JULY

### PATH GUIDING IN PRODUCTION

**2 PM-5:15 PM**

**Level:** Intermediate

**Moderator:**
- Jiří Vorba
- Johannes Hanika
- Weta Digital

**Lecturers:**
- Sebastian Herholz
  - University of Tübingen
  - Jaroslav Klívánek
  - Charles University, Prague; Render Legion
  - Alexander Keller
  - NVIDIA Research

### CREATIVExAI: DEEP LEARNING FOR GRAPHICS

**9 AM-12:15 PM**

**Level:** Beginner

**Moderator:**
- Niloy J. Mitra
  - University College London

**Lecturers:**
- Iasonas Kokkinos
  - University College London
- Paul Guerrero
  - NVIDIA
- Nils Thuerey
  - TU Munich
- Vladimir Kim
  - Adobe Research
- Leonidas Guibas
  - Stanford University

### ADVANCES IN REAL-TIME RENDERS IN GAMES: PART 1

**9 AM-12:15 PM**

**Level:** Intermediate

**Lecturer:**
- Natalya Tatarchuk
  - Unity Technologies

### ADVANCES IN REAL-TIME RENDERS IN GAMES: PART 2

**2 PM-5:15 PM**

**Level:** Intermediate

**Lecturer:**
- Natalya Tatarchuk
  - Unity Technologies

### LIGHTING DESIGN FOR STYLIZED ANIMATION

**3:45 PM-5:15 PM**

**Level:** Beginner

**Lecturer:**
- Dave Walvoord
  - DreamWorks Animation

### TUESDAY, 30 JULY

### PRACTICAL COURSE ON COMPUTING DERIVATIVES IN CODE

**9 AM-10:30 AM**

**Level:** Intermediate

**Lecturer:**
- Craig Schroeder
  - University of California Riverside
TUESDAY, 30 JULY

GEOMETRIC COMPUTING WITH PYTHON
2 PM-3:30 PM

R&E

Level: Beginner

Lecturers
Sebastian Koch
TU Berlin

Teseo Schneider
Francis Williams
Daniele Panozzo
New York University, NYU Courant Institute

CINEMATIC SCIENTIFIC VISUALIZATION: THE ART OF COMMUNICATING SCIENCE
2 PM-5:15 PM

R&E A&D

Level: Beginner

Moderators
Kalina Borkiewicz
AJ Christensen
National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign

Lecturers
Ryan Wyatt
California Academy of Sciences,
Morrison Planetarium

Greg Shirah
NASA, Scientific Visualization Studio

Helen-Nicole Kostis
USRA/GESTAR, NASA/SVS

WEDNESDAY, 31 JULY

OPEN PROBLEMS IN REAL-TIME RENDERING
2 PM-5:15 PM

G&I

Level: Intermediate

Lecturers
Natalya Tatarchuk
Unity Technologies

Aaron Lefohn
NVIDIA

PATH TRACING IN PRODUCTION PART 1
9 AM-12:15 PM

P&A

Level: Intermediate

Moderators
Luca Fascione
Weta Digital

Johannes Hanika
Weta Digital, Karlsruhe Institute of Technology

Lecturers
Marc Droske
Jorge Schwarzhaupt
Weta Digital

Daniel Heckenberg
Animal Logic

Christopher Kulla
Sony Pictures Imageworks

COLOR FUNDAMENTALS FOR DIGITAL CONTENT CREATION, VISUALIZATION AND EXPLORATION
9 AM-10:30 AM

A&D

Level: Beginner

Lecturer
Theresa-Marie Rhyne
Consultant

GEOMETRIC ALGEBRA FOR COMPUTER GRAPHICS
2 PM-3:30 PM

R&E

Level: Intermediate

Lecturers
Charles Gunn
Raum+Gegenraum

Steven De Keninck
Angle Gaming Labs

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Business Symposium (B)
- Exhibitors (E)
- Exhibitors (EX)
- Experiences (XP)

INTEREST AREAS
- Production & Animation (P&A)
- Research & Education (R&E)
- Arts & Design (A&D)
- Gaming & Interactive (G&I)
- New Technologies (NT)

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
WEDNESDAY, 31 JULY

AN INTRODUCTION TO PHYSICS-BASED ANIMATIONS
2 PM-5:15 PM

P&A G&I

Level: Beginner

Lecturers
Adam Bargteil
University of Maryland, Baltimore County

Tamar Shinar
University of California, Riverside

PATHTRACING IN PRODUCTION PART 2
2 PM-5:15 PM

P&A

Level: Intermediate

Moderators
Luca Fascione
Weta Digital

Johannes Hanika
Weta Digital, Karlsruhe Institute of Technology

Lecturers
Wenzel Jakob
EPFL

Andrea Weidlich
Weta Digital

Rob Piekle
MPC

Hanzhi Tang
Digital Domain

Andrew Beddini
Blue Sky Studios

THURSDAY, 1 AUGUST

MY FAVORITE SAMPLES
9 AM-12:15 PM

R&E

Level: Advanced

Moderator
Alexander Keller
NVIDIA

Lecturers
Iliyan Georgiev
Autodesk

Abdalla Ahmed
King Abdulaziz University of Science and Technology

Per Christensen
Pixar Animation Studios

Matt Pharr
NVIDIA

DIFFERENTIABLE GRAPHICS WITH TENSORFLOW 2.0
9 AM-12:15 PM

NT

Level: Intermediate

Moderator
Sofien Bouaziz
Google

Lecturers
Julien Valentin
Paige Bailey
Josh Gordon
Christian Haene
Alexander Mordvintsev
Shan Carter
Google

CAPTURE4VR: FROM VR PHOTOGRAPHY TO VR VIDEO
2 PM-5:15 PM

NT

Level: Intermediate

Moderator
Christian Richardt
University of Bath

Lecturers
Peter Hedman
University College London

Ryan S. Overbeck
Google LLC

Brian Cabral
Facebook

Robert Konrad
Stanford University

Steve Sullivan
Microsoft

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
- P&A Production & Animation
- R&E Research & Education
- A&D Arts & Design
- G&I Gaming & Interactive
- NT New Technologies

RETURN TO TABLE OF CONTENTS
THURSDAY, 1 AUGUST

ON HYBRID LAGRANGIAN-EULERIAN SIMULATION METHODS: PRACTICAL NOTES AND HIGH-PERFORMANCE ASPECTS
3:45 PM-5:15 PM

Level: Intermediate
Moderator
Chenfanfu Jiang
University of Pennsylvania

Lecturers
Yuanming Hu
MIT CSAIL

Xinxin Zhang
Beijing Film Academy

Ming Gao
Chenfanfu Jiang
University of Pennsylvania

RTX ACCELERATED RAY TRACING WITH OPTIX
3:45 PM-5:15 PM

Level: Intermediate

Lecturers
Ingo Wald
Steven G. Parker
NVIDIA
The Educator’s Forum is devoted entirely to content for educators, allowing you to optimize your conference experience and recharge for the upcoming school year. It will showcase material in the form of panels, talks, courses, and Groovy Graphics Assignments. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/educators-forum/

**SUNDAY, 28 JULY**

**EDUCATOR’S FORUM MEET & GREET RECEPTION**
3:30 PM-5 PM

**MONDAY, 29 JULY**

**EDUCATOR’S FORUM EDUCATION COMMITTEE WELCOME**
8:30 AM-9 AM

---

**EDUCATOR’S FORUM PANEL:**
**PREPARING STUDENTS TO TAKE THE NEXT STEP: SCHOOL TO WORK TRANSITION (DEMO REELS AND BEYOND)**
9 AM-10:30 AM

**Moderator**
Glenn Goldman
New Jersey Institute of Technology

**Panelists**
Jimmy Ockey
Animal Logic

Javier Romerollion
Animation Studios

Sylvie Tehbelian
MPC Film/The Focus

Elizabeth Zavitsanos
Activision

---

**Groovy Assignment: The VR Ride**
Nick Jushchyshyn
Robert Lloyd
Erik Sundquist
Drexel University

---

**Creating a Modern Classic Visual Effect**
Ken Cameron
University of Bath

---

**EDUCATOR’S FORUM COURSE:**
**PROCEDURAL ORGANIC MODELING**
3:45 PM-5:15 PM

**Moderator**
David Bachman
Pitzer College

---

**EDUCATOR’S FORUM GROOVY GRAPHIC ASSIGNMENTS**
10:45 AM-12:15 PM

**Image Glitching: Manipulating Images with Audio Effects**
Erik Brunvand
University of Utah

---

**RETURN TO TABLE OF CONTENTS**
TUESDAY, 30 JULY

EDUCATOR’S FORUM EDUCATION COMMITTEE WELCOME
8:30 AM-9 AM

EDUCATOR’S FORUM PANEL: APPROACHES FOR IMMERSIVE MEDIA CURRICULUM IMPLEMENTATION
9 AM-10:30 AM

R&E
Moderator
Nick Jushchyshyn
Drexel University

Panelists
Timothy McLaughlin
Texas A&M University
Morgan Woolverton
Ringling College of Art + Design

EDUCATOR’S FORUM TALKS: SIGCSE REPRISE
10:45 AM-12:15 PM

R&E
Achieving Gender Balance through Creative Expression
William Bares
Bill Manaris
Renee McCauley
Christine Moore
College of Charleston

Trials by Flyer: Building Quadcopters From Scratch in a Ten-Week Capstone Course
Steven Swanson
University of California, San Diego

EDUCATOR’S FORUM COURSE: A (MOSTLY) PLATFORM-AGNOSTIC APPROACH TO MODERN GPU APIs
2 PM-3:30 PM

R&E
Dave Shreiner
Unity Technologies

Stitching the Loop with Electronic Textiles
Deborah Fields
Utah State University

Yasmin Kafai
Debora A. Lui
Justice Walker
Mia S. Shaw
Gaythiri Jayathirtha
University of Pennsylvania

Tomoko M. Nakajima
University of California, Los Angeles

Joanna Goode
University of Oregon

Michael T. Giang
California State Polytechnic University, Pomona

One Size Fits All: Designing for Socialization in Physical Computing
Gabriella Anton
Uri Wilensky
Northwestern University

EDUCATOR’S FORUM BIRDS OF A FEATHER: VR AND EDUCATION
3:45 PM-5:15 PM

NT R&E
Barbara Mones
University of Washington

KEYS
REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
P&A Production & Animation
R&E Research & Education
A&D Arts & Design
G&I Gaming & Interactive
NT New Technologies
+ Curated Content

RETURN TO TABLE OF CONTENTS
A mid-point between inception and adoption, the Emerging Technologies program offers a preview of what’s to come. More specifically, this year’s attendees will witness the ways technology is making the world better. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/emerging-technologies/

Emerging Technologies interest areas:  

**INTEREST AREAS**

**Production & Animation**

**Research & Education**

**Arts & Design**

**Gaming & Interactive**

**New Technologies**

**Adaptive Tech**

---

**360-DEGREE TRANSPARENT HOLOGRAPHIC SCREEN DISPLAY**

Tomoharu Nakamura  
Tomoya Yano  
Kohki Watanabe  
Yui Ishii  
Hideki Ono  
Ippei Tambata  
Nobuki Furue  
Yuji Nakahata  
Adobe Research

**A DESIGN FOR OPTICAL CLOAKING DISPLAY**

Takahito Aoto  
*University of Tsukuba*

Yuta Itoh  
Kazuki Otao  
Kazuki Takazawa  
Yoichi Ochiai  
*University of Tsukuba; Pixie Dust Technologies, Inc.*

**A COMPACT RETINAL SCAN NEAR-EYE DISPLAY**

Katsuyuki Akutsu  
Susumu Seino  
Yusuke Ogawa  
Kenji Ohki  
Atsushi Takahashi  
Daisuke Ueda  
Ryo Ogawa  
Teppei Inamura  
Akira Yoshikae  
Sony Corporation

**A TRANSPARENT DISPLAY WITH PER-PIXEL COLOR AND OPACITY CONTROL**

TJ Rhodes  
Gavin Miller  
Li-Yi Wei  
Qi Sun  
Daichi Ito  
Adobe Research

**ACTIVE TEXTILE TAILORING**

Skylar Tibbits  
Jared Laucks  
Schendy Kernizan  
Bjorn Sparman  
Lavender Tessmer  
Carmel Snow  
*MIT, Self-Assembly Lab*

Gihan Armarasiriwardena  
*Ministry of Supply*

**A STRETCH-SENSING SOFT GLOVE FOR INTERACTIVE HAND POSE ESTIMATION**

Oliver Glauser  
Shihao Wu  
*ETH Zurich*

Daniele Panozzo  
*New York University*

Otmar Hilliges  
Olga Sorkine-Hornung  
*ETH Zurich*
**AFFECTIVE HMD: FACIAL EXPRESSION RECOGNITION IN HEAD MOUNTED DISPLAY USING EMBEDDED PHOTO REFLECTIVE SENSORS**

Masaaki Murakami  
Kosuke Kikui  
Katsuhiko Suzuki  
Fumihiko Nakamura  
Masaaki Fukukoka  
Katsutoshi Masai  
Yuta Sugiuara  
Maki Sugimoto  
Keio University

**ARQUE: ARTIFICIAL BIOMIMICRY-INSPIRED TAIL FOR EXTENDING INNATE BODY FUNCTIONS**

Junichi Nabeshima  
MHD Yamen Saraiji  
Keio University Graduate School of Media Design  
Kouta Minamizawa  
Keio University Graduate School of Media Design, Japan Science and Technology Agency

**CHICMR: IMMERSIVE MIXED REALITY SYSTEM USING VIDEO-SEE-THRU HMD AND 3D LIDAR SCANNER**

Jin Ha Hwang  
Center of Human-Centered Interaction for Coexistence  
Hyukmin Kwon  
Korea Institute of Science and Technology  
Younguk Kim  
Yong-Ho Lee  
Jinbaek Kim  
JungKyung Kim  
Bum-Jae You  
Center of Human-Centered Interaction for Coexistence

**DEMONSTRATING PREEMPTIVE ACTION: ACCELERATING HUMAN REACTION USING ELECTRICAL MUSCLE STIMULATION WITHOUT COMPROMISING AGENCY**

Jun Nishida  
University of Chicago, Sony CSL  
Shunichi Kasahara  
Sony CSL, University of Tokyo  
Pedro Lopes  
University of Chicago, Hasso-Plattner Institute

**GLIDERREALITY: A HIGHLY IMMERSIVE VR SYSTEM AUGMENTED BY A NOVEL MULTI-MODAL AND MULTI-CONTACT CUTANEOUS WEARABLE DISPLAY**

Miguel Altamirano Cabrera  
Jonathan Andres Tirado Rosero  
Dzmitry Tsetserukou  
Skolkovo Institute of Science and Technology

**GOLF TRAINING SYSTEM USING SONIFICATION AND VIRTUAL SHADOW**

Atsuki Ikeda  
Yuka Tanaka  
Dong-Hyun Hwang  
Homare Kon  
Hideki Koike  
Tokyo Institute of Technology

**EIGEN ZOETROPE**

Gou Koutaki  
Kumamoto University

**EYEHACKER: GAZE-BASED AUTOMATIC REALITY MANIPULATION**

Daichi Ito  
Graduate School of Information Science and Technology, The University of Tokyo  
Sohei Wakisaka  
Atsushi Izumihara  
Research Center for Advanced Science and Technology, The University of Tokyo  
Tomoya Yamaguchi  
National Institute of Technology, Ishikawa College  
Atsushi Hiyama  
Masahiko Inami  
Research Center for Advanced Science and Technology, The University of Tokyo

**HAPTIC PLASTER: SOFT, THIN, LIGHT AND FLEXIBLE HAPTIC DISPLAY USING DEA COMPOSED OF SLIDE-RING MATERIAL FOR DAILY LIFE**

Tadatoshi Kurogi  
Keio University Graduate School of Media Design; TOYODA GOSEI Co., Ltd.  
Yuji Yonehara  
TOYODA GOSEI Co., Ltd.  
Roshan Lalitha Peiris  
Keio University Graduate School of Media Design  
Takeshi Fujiwara  
TOYODA GOSEI Co., Ltd.  
Kouta Minamizawa  
Keio University Graduate School of Media Design, Japan Science and Technology Agency

**AFFECTIVE HMD: FACIAL EXPRESSION RECOGNITION IN HEAD MOUNTED DISPLAY USING EMBEDDED PHOTO REFLECTIVE SENSORS**

Masaaki Murakami  
Kosuke Kikui  
Katsuhiko Suzuki  
Fumihiko Nakamura  
Masaaki Fukukoka  
Katsutoshi Masai  
Yuta Sugiuara  
Maki Sugimoto  
Keio University

**ARQUE: ARTIFICIAL BIOMIMICRY-INSPIRED TAIL FOR EXTENDING INNATE BODY FUNCTIONS**

Junichi Nabeshima  
MHD Yamen Saraiji  
Keio University Graduate School of Media Design  
Kouta Minamizawa  
Keio University Graduate School of Media Design, Japan Science and Technology Agency

**CHICMR: IMMERSIVE MIXED REALITY SYSTEM USING VIDEO-SEE-THRU HMD AND 3D LIDAR SCANNER**

Jin Ha Hwang  
Center of Human-Centered Interaction for Coexistence  
Hyukmin Kwon  
Korea Institute of Science and Technology  
Younguk Kim  
Yong-Ho Lee  
Jinbaek Kim  
JungKyung Kim  
Bum-Jae You  
Center of Human-Centered Interaction for Coexistence

**DEMONSTRATING PREEMPTIVE ACTION: ACCELERATING HUMAN REACTION USING ELECTRICAL MUSCLE STIMULATION WITHOUT COMPROMISING AGENCY**

Jun Nishida  
University of Chicago, Sony CSL  
Shunichi Kasahara  
Sony CSL, University of Tokyo  
Pedro Lopes  
University of Chicago, Hasso-Plattner Institute

**GLIDERREALITY: A HIGHLY IMMERSIVE VR SYSTEM AUGMENTED BY A NOVEL MULTI-MODAL AND MULTI-CONTACT CUTANEOUS WEARABLE DISPLAY**

Miguel Altamirano Cabrera  
Jonathan Andres Tirado Rosero  
Dzmitry Tsetserukou  
Skolkovo Institute of Science and Technology

**GOLF TRAINING SYSTEM USING SONIFICATION AND VIRTUAL SHADOW**

Atsuki Ikeda  
Yuka Tanaka  
Dong-Hyun Hwang  
Homare Kon  
Hideki Koike  
Tokyo Institute of Technology

**EIGEN ZOETROPE**

Gou Koutaki  
Kumamoto University

**EYEHACKER: GAZE-BASED AUTOMATIC REALITY MANIPULATION**

Daichi Ito  
Graduate School of Information Science and Technology, The University of Tokyo  
Sohei Wakisaka  
Atsushi Izumihara  
Research Center for Advanced Science and Technology, The University of Tokyo  
Tomoya Yamaguchi  
National Institute of Technology, Ishikawa College  
Atsushi Hiyama  
Masahiko Inami  
Research Center for Advanced Science and Technology, The University of Tokyo

**HAPTIC PLASTER: SOFT, THIN, LIGHT AND FLEXIBLE HAPTIC DISPLAY USING DEA COMPOSED OF SLIDE-RING MATERIAL FOR DAILY LIFE**

Tadatoshi Kurogi  
Keio University Graduate School of Media Design; TOYODA GOSEI Co., Ltd.  
Yuji Yonehara  
TOYODA GOSEI Co., Ltd.  
Roshan Lalitha Peiris  
Keio University Graduate School of Media Design  
Takeshi Fujiwara  
TOYODA GOSEI Co., Ltd.  
Kouta Minamizawa  
Keio University Graduate School of Media Design, Japan Science and Technology Agency
EMERGING TECHNOLOGIES, CONTINUED

**LIQUID PRINTED PNEUMATICS**
Bjorn Sparrman
Schendy Kernizan
Jared Laucks
Skylar Tibbits
MIT Self-Assembly Lab

Christopher Guberan
Product Designer

**MAGNIFIER: MAGNIFIED PERCEPTION BY A FINGERTIP PROBE MICROSCOPE**
Noriyasu Obushi
Sohei Wakisaka
The University of Tokyo

Shunichi Kasahara
The University of Tokyo, Sony Computer Science Laboratories, Inc.

Atsushi Hiyama
The University of Tokyo, RIKEN Center for Advanced Intelligence Project

Masahiko Inami
The University of Tokyo

**MATCHING VISUAL ACUITY & PRESCRIPTION: TOWARDS AR FOR HUMANS**
Jonghyun Kim
Michael Stengel
NVIDIA

Jui-Yi Wu
National Chiao Tung University

Ben Boudaoud
Josef Spjut
Kaan Akşit
NVIDIA

Morgan McGuire
University of Waterloo

David Luebke
Rachel Albert
Trey Greer
NVIDIA

Youngmo Jeong
Seoul National University

Ward Lopes
Zander Majercik
Peter Shirley
NVIDIA

**MELODY SLOT MACHINE**
Masatoshi Hamanaka
RIKEN

Takayuki Nakatsuka
Waseda University, RIKEN

Shigeo Morishima
Waseda Research Institute for Science and Engineering

**PICKHITS: HITTING EXPERIENCE GENERATION WITH THROWING MOTION VIA A HANDHELD MECHANICAL DEVICE**
Azumi Maekawa
Seito Matsubara
Atsushi Hiyama
Masahiko Inami
The University of Tokyo

**PINOCCHIOVR**
Makoto Uju
Kenichiro Shiroti
Roshan Peris
Kouta Minamizawa
Keio University Graduate School of Media Design

**SHADING ATLAS STREAMING**
Joerg H. Mueller
Thomas Neff
Philip Voglreiter
Graz University of Technology

Mina Makar
Qualcomm Technologies Inc.

Markus Steinberger
Graz University of Technology

Dieter Schmalstieg
Graz University of Technology, Qualcomm Technologies Inc.

Elena Ivanchenko
Michael Kenzel
Graz University of Technology

---

**REGISTRATION LEVELS**
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Business Symposium (B)
- Exhibitors (EX)
- Exhibits (E)
- Experiences (XP)

**INTEREST AREAS**
- Production & Animation (P&A)
- Research & Education (R&E)
- Arts & Design (A&D)
- Gaming & Interactive (G&I)
- New Technologies (NT)
- Adaptive Tech (AT)
- Curated Content (C)
EMERGING TECHNOLOGIES, CONTINUED

SHAPESENSE: A 2D SHAPE RENDERING VR DEVICE WITH MOVING SURFACES THAT CONTROLS MASS PROPERTIES AND AIR RESISTANCE

Yuhu Liu
Takenu Hashimoto
The University of Tokyo

Shigeo Yoshida
Takju Narumi
The University of Tokyo; JST, PRESTO

Tomohiro Tanikawa
Michitaka Hirose
The University of Tokyo

SPACE WALK: A COMBINATION OF SUBTLE REDIRECTED WALKING TECHNIQUES INTEGRATED WITH GAMEPLAY AND NARRATION

Eike Langbehn
Frank Steinicke
University of Hamburg

TEEV: SPATIAL TEMPLATE-BASED ACQUISITION, MODELING, AND RENDERING OF LARGE-SCALE INDOOR SPACES

Nakju Doh
Korea University; TeeLabs Co., Ltd.

Hyunga Choi
Korea University

Bumchul Jang
Sangmin Ahn
Korea University; TeeLabs Co., Ltd.

Hyojin Jung
Sungkyunkwan University; TeeLabs Co., Ltd.

Sungkil Lee
Sungkyunkwan University

TELESIGHT: ENABLING ASYMMETRIC COLLABORATION IN VR BETWEEN HMD USER AND NON-HMD USERS

Taichi Furukawa
Daisuke Yamamoto
Moe Sugawa
Roshan Peiris
Kouta Minamisawa
Keio University Graduate School of Media Design

TRANSFANTOME: TRANSFORMATION INTO BODIES OF VARIOUS SCALE AND STRUCTURE IN MULTIPLE SPACES

Atsushi Izumihara
Tomoya Sasaki
Masahiro Ogino
The University of Tokyo

Reona Takamura
Kobelco Construction Machinery Co., Ltd.

Masahiko Inami
The University of Tokyo

KEYS

REGISTRATION LEVELS

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS

- P&A Production & Animation
- R&E Research & Education
- A&D Arts & Design
- G&I Gaming & Interactive
- NT New Technologies

RETURN TO TABLE OF CONTENTS

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
Panels provide a unique attendee experience with a moderator conducting a discussion with three or four expert panelists with varied viewpoints and experience. Interest and novel ideas arise through discussion, agreement, controversy and audience interaction. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/panels/

Seating is on a first-come, first-served basis. Please arrive early for the panel you wish to attend.

**SUNDAY, 28 JULY**

**PREDICTIVE AND PROACTIVE PIPELINES: APPROACHES TO MONITORING AND OPTIMIZING CG FILM PRODUCTION**  
3:45 PM-5:15 PM  
[Panel](#)  
**Moderator**  
Claudi Chung Sanii  
Walt Disney Animation Studios  
**Panelists**  
Sean Palmer  
Walt Disney Animation Studios  
Kaori Ogino  
Industrial Light and Magic  
Aidan Sarsfield  
Animal Logic  
Munira Tayabji  
DreamWorks Animation  
Mark Hill  
Framestore  
Renee Tarn  
Pixar Animation Studios  
Nick Epstein  
Weta Digital

**MONDAY, 29 JULY**

**THE ETHICAL AND PRIVACY IMPLICATIONS OF MIXED REALITY**  
10:45 AM-12:15 PM  
[Panel](#)  
**Moderator**  
Kent Bye  
Voices of VR Podcast  
**Panelists**  
Diane Hosflet  
Mozilla  
Matt Miesnieks  
6D.AI  
Samantha Mathews Chase  
Venn.Agency  
Taylor Beck  
Magic Leap

**BRANDING & MARKETING: STRATEGIES FOR GLOBAL TALENT ACQUISITION IN TODAY’S DIGITAL MEDIA PRODUCTION MARKET**  
3:45 PM-5:15 PM  
[Panel](#)  
**Moderator**  
Stan Szymanski  
StanleyVision, Technicolor Production Services  
**Panelists**  
Kerry Shea  
MPC Film  
Kim Mackey  
Skydance Media  
Dorothy Montgomery  
City National Bank  
Brian Hemsworth  
Newman Grace Inc., Pepperdine University

---

**KEYS**

**REGISTRATION LEVELS**
- Full Conference Platinum (FP)  
- Full Conference One-Day (FOD)  
- Full Conference (F)  
- Select Conference (S)  
- Experiences (XP)  
- Exhibits (E)  
- Exhibitors (EX)  
- Business Symposium (B)

**INTEREST AREAS**
- P&A Production & Animation  
- R&E Research & Education  
- A&D Arts & Design  
- G&I Gaming & Interactive  
- NT New Technologies

RETURN TO TABLE OF CONTENTS
TUESDAY, 30 JULY

FACS AT 40
9 AM-10:30 AM

Productions & Animation
Research & Education
Arts & Design
Gaming & Interactive
New Technologies

Moderator
Mike Seymour
University of Sydney, fxguide

Panelists
Erika Rosenberg
Stanford University, Erika Rosenberg Consulting
Vladimir Mastilovic
3Lateral
Mark Sagar
Soul Machines
John Peter Lewis
Google AI

WEDNESDAY, 31 JULY

UNTOLD HERSTORIES: AN HOMAGE TO SIGGRAPH
9 AM-10:30 AM

Research & Education
New Technologies

Moderator
Donna Cox
National Center for Supercomputing Applications,
University of Illinois at Urbana-Champaign

Panelists
Erika Rosenberg
Stanford University, Erika Rosenberg Consulting
Vladimir Mastilovic
3Lateral
Mark Sagar
Soul Machines
John Peter Lewis
Google AI

VR/AR/MR FOR EVERYONE!
10:45 AM-12:15 PM

New Technologies

Moderator
Jordyn MJ Curley
Czarnowski

Panelists
John Canning
Digital Domain
Elvis Au
Blue Sky Studios
Stephen Phillips
Theia Interactive
Michael McCarthy
Samuel Conlogue
Infusion Studios, Czarnowski

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
- Production & Animation (P&A)
- Research & Education (R&E)
- Arts & Design (A&D)
- Gaming & Interactive (G&I)
- New Technologies (NT)
THURSDAY, 1 AUGUST

FUTURE OF SHARED EXPERIENCES: XR IS A LONELY WORLD

2 PM-3:30 PM

G&I NT

Moderator
Aaron Sisto
VentureX

Panelists
Anand Agarawala
Spatial

Varun Mani
PTC

Mark Mine
Disney Imagineering

Jameson Detweiler
Fantasmo

Ben Grossman
Magnopus

Victor Luo
NASA Jet Propulsion Laboratory
Production Sessions bring the production community together to learn from the brightest minds in graphics. These sessions leave attendees feeling inspired, energized, and ready to push new boundaries. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/computer-animation-festival/production-sessions/

**Interest Areas:** P&A  R&E  A&D  G&I  NT

**MONDAY, 29 JULY**

**THE MAKING OF MARVEL STUDIOS’ “AVENGERS: ENDGAME”**

3:45 PM-5:15 PM

**Panelists**
Victoria Alonso (Executive Producer)
Dan DeLeeuw (VFX Supervisor)
Jen Underdahl (VFX Producer)
Marvel Studios

Kelly Port (VFX Supervisor)
Digital Domain

Russell Earl (VFX Supervisor)
Industrial Light & Magic

Matt Aitken (VFX Supervisor)
Weta Digital

Gerardo Ramirez (Visualization Supervisor)
The Third Floor

**TUESDAY, 30 JULY**

**DISNEY PRESENTS: THE MAKING OF THE LION KING**

10:45 AM-12:15 PM

**Panelists**
Rob Legato (Production VFX Supervisor)
Caleb Deschanel (Director of Photography, ASC)
Walt Disney

**STEP RIGHT UP, EVERYONE’S A WINNER – THE MAKING OF “TOY STORY 4”**

2 PM-3:30 PM

**Panelists**
Bob Moyer (Supervising Technical Director)
Bill Reeves (Technology & Pipeline Supervisor)
Derek Williams (Layout Lead)
Thomas Jordan (Sets Supervisor)
Steve Karski (Sets Supervisor)
Mariana Galindo (Tailoring Lead)
Amy Jones (Lighting Lead)
Ariela Fedorov (Rendering Supervisor)
Pixar Animation Studios

**WEDNESDAY, 31 JULY**

**“HOW TO TRAIN YOUR DRAGON”: THE HIDDEN WHAT?**

3:45 PM-5:15 PM

**Panelists**
Dave Walvoord (Visual Effects Supervisor)
Lawrence Lee (Head of FX)
Munira Tayabji (Visual Effects Supervisor)
Pablo Valle (Head of Lighting)
Chris De St. Jeor (Character FX Lead)
DreamWorks Animation

**CREATING THE IMMERSIVE WORLD OF BIOWARE’S ANTHEM**

10:45 AM-12:15 PM

**Panelists**
Gracie Arenas Strittmatter (Technical Art Director)
Jeff Vanelle (Senior Technical Artist I)
Ben Cloward (Senior Technical Artist II)
Eve Colvin (Senior Technical Artist I)
Darrin Stewart (Senior Software Engineer)
BioWare; Electronic Arts
WEDNESDAY, 31 JULY

“SPACE EXPLORERS: LIFE IN ORBIT” – FILMING VR IN MICROGRAVITY
2 PM-3:30 PM

Panelists
Sebastian Sylwan (CTO & Creative Partner)
Felix & Paul Studios
Michael Interbartolo (Moonshot Navigator)
NASA
Liz Warren (Associate Program Scientist)
CASIS

THE VFX OF NETFLIX SERIES
3:45 PM-5:15 PM

Panelists
Sean Santiago (Director, VFX, Netflix Original Series)
Netflix
Chris White (VFX Supervisor)
Weta Digital
Aladino Debert (VFX Supervisor)
Digital Domain
Yvon Jardel (Animation Supervisor)
Rodeo FX
Paul Graff (VFX Supervisor)
Sue Rowe (VFX Supervisor)
Everett Burrell (VFX Supervisor)

THURSDAY, 1 AUGUST

“FIRST MAN”: REDEFINING IN-CAMERA FX
10:45 AM-12:15 PM

Panelists
Michelle Eisenreich
Tristan Myles (DFX Supervisor)
DNEG
Ian Hunter (Miniature Effects Supervisor)
New Deal Studios

“ALITA: BATTLE ANGEL" - THE ART OF BEING HUMAN
2 PM-3:30 PM

Panelist
Nick Epstein (Visual Effects Supervisor)
Weta Digital

 FOR THE THRONE – THE MAKING OF “GAMES OF THRONES”: SEASON 8
6:30 PM-8 PM

Panelists
Martin Hill (Visual Effects Supervisor)
Weta Digital
Thomas Scheslesny (Visual Effects Supervisor)
Image Engine
Mohsen Mousavizadeh (Visual Effects Supervisor)
Scanline
Sven Martin (Visual Effects Supervisor)
Pixomondo

3:45 PM-5:15 PM

Panelists
Danny Dimian (VFX Supervisor)
Joshua Beveridge (Animation Supervisor)
Bret St. Clair (Look Development Supervisor)
Pav Grochola (FX Supervisor)
Ben Hendricks (CG Supervisor)
Sony Pictures Imageworks

PRODUCTION GALLERY
This one-of-a-kind exhibit recognizes the art, processes, and physical materials involved in the creation of major studio projects — not just the final piece on screen. The gallery features artwork, props, and more from recent film, VR, or game productions for an exclusive behind-the-scenes look at some of Hollywood’s biggest blockbusters.

Hours
Sunday, 28 July, 11:30 AM-5:30 PM
Monday, 29 July, 9 AM-5:30 PM
Tuesday, 30 July, 9 AM-5:30 PM
Wednesday, 31 July, 9 AM-5:30 PM
Thursday, 1 August, 9 AM-2 PM
Real-Time Live! showcases cutting-edge real-time technology with a captive, world-wide audience. Whether it’s games, movies, simulation, virtual reality, augmented reality, or otherwise — there is no better opportunity for creators to plant roots and make a mark in real-time history. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/real-time-live/

Interest Areas: G&I NT P&A

**BEST REAL-TIME GRAPHICS AND INTERACTIVITY AWARD**

Developers create and showcase the best real-time graphics and interactivity applications possible using today’s technologies. The winning team is announced from the Real-Time Live! stage.

**CAUSING CHAOS: PHYSICS AND DESTRUCTION IN UNREAL ENGINE**

Michael Lentine
Jim Van Allen
Matthias Worch
Epic Games, Inc.

**GAUGAN: SEMANTIC IMAGE SYNTHESIS WITH SPATIALLY ADAPTIVE NORMALIZATION**

Taesung Park
University of California Berkeley

Ming-Yu Liu
Ting-Chun Wang
NVIDIA

Jun-Yan Zhu
MIT

**LEVEL EX: TRACING ALL KINDS OF RAYS ON MOBILE**

Sam Glassenberg
Matthew Yaeger
Level Ex, Inc.

**OLD SCHOOL/NEW COOL: DRIVING LIVE ENGAGEMENT THROUGH MIXED MEDI UMS IN REAL-TIME**

Albert Lan
Michael Dolan
Voodoo Station

**PROJECT NIRA: INSTANT INTERACTIVE REAL-TIME ACCESS TO MULTI-GIGABYTE SIZED 3D ASSETS ON ANY DEVICE**

Arash Keissami
Andrew Johnson
dRaster, Inc.; Nira.app

Dario Manesku
dRaster, Inc.

**QUIXEL’S REBIRTH: MEGASCANS ENVIRONMENT BREAKDOWN**

Galen Davis
Quixel

**REAL-TIME PROCEDURAL VFX CHARACTERS IN UNITY’S REAL-TIME SHORT FILM “THE HERETIC”**

Veselin Efremov
Adrian Lazar
Unity Technologies

**REAL-TIME, SINGLE CAMERA, DIGITAL HUMAN DEVELOPMENT**

Doug Roble
Darren Hendler
Jeremy Buttell
Lonnie Iannazzo
Melissa Cell
Deer Li
Jason Briggs
Chad Reddick
Mark Williams
Lucio Moser
Cydney Wong
Dimitry Kachkovski
Jason Huang
Kai Zhang
David McLean
Rickey Cloudsdale
Dan Milling
Ron Miller
JT Lawrence
Chinyu Chien
Digital Domain

**HOURS**

Tuesday, 30 July, 6 PM-7:45 PM
“REALITY VS ILLUSION” REAL-TIME RAY TRACING
Natalie Burke
Arisa Scott
Natalya Tatarchuk
Sebastien Lagarde
Unity Technologies

SPOOKY ACTION AT A DISTANCE: REAL-TIME VR INTERACTION FOR NON REAL-TIME REMOTE ROBOTICS
Pavel Savkin
Nathan Quinn
Lochlainn Wilson
SE4 Inc

VR HAIR SALON FOR AVATARS
Hao Li
Pinscreen, USC/ICT

Jun Xing
miHoYo Inc.

Koki Nagano
Liwen Hu
Pinscreen

Li-Yi Wei
Adobe Research

KEYS
REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
P&A Production & Animation
R&E Research & Education
A&D Arts & Design
G&I Gaming & Interactive
NT New Technologies

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
The Studio is a place to come and try out all the amazing technology and experiment with the ideas that surround us at SIGGRAPH. Sit down and create something, learn something, and collaborate. Let’s make something. Let’s play! For content descriptions, visit [https://s2019.siggraph.org/conference/programs-events/studio/](https://s2019.siggraph.org/conference/programs-events/studio/)

**STUDIO INSTALLATIONS**

**3D PRINTING ON FABRIC**
David Shorey
Shorey Designs

**DRONEGRAFFITI: AUTONOMOUS MULTI-UAV SPRAY PAINTING**
Anastasia Uryasheva
Tsuru Robotics, Skolkovo Institute of Science and Technology

Mikhail Kulbeda
Skolkovo Institute of Science and Technology

Nikita Rodichenko
Tsuru Robotics

Dzmitry Tsetserukou
Skolkovo Institute of Science and Technology

**ENTRAIN: ENCOURAGING SOCIAL INTERACTION IN COLLECTIVE MUSIC MAKING**
Hugo Scurto
Wanyu Liu
Benjamin Matuszewski
Frédéric Bevilacqua
STMS IRCAM-CNRS-SU

Jean-Louis Frechin
Uros Petrevski
Nodesign.net

Norbert Schnell
Furtwangen University

**FRAGMENT SHADOW: GENERATING FRAGMENTED SHADOWS WITH MULTI-PROJECTORS GEOMETRY AND COLOR CALIBRATION**
Shunichi Kasahara
Sony Computer Science Laboratories, Inc.; University of Tokyo

Satoru Higa
Backspace Productions Inc.

Akihiro Komori
Koozyt, Inc.

**IMVERSE LIVEMAKER - CREATE AND COMBINE VOLUMETRIC MODELS INTO A COMPLETE 3D INTERACTIVE SCENE INSIDE VR**
Javier Bello Ruiz
Robin Mange
Alexander Manolov
Benoit Perrin
Charlotte Gubler
Kepa Iturrioz Zabala
Joaquim Bratschi
imverse SA

**PROGRAMMING EMBROIDERY WITH TURTLESTITCH**
Ursula Wolz
RiverSound Solutions

Michael Aschauer
Andrea Mayr-Stalder
turtlestitch.org

Paulina Valdivieso
Bennington College

AnneMarie Webber
Mount Anthony Union High School

Tanya Dixon
RiverSound Solutions

**HOURS**
Sunday, 28 July, 1:30 PM-5:30 PM
Monday, 29 July, 10 AM-5:30 PM
Tuesday, 30 July, 10 AM-5:30 PM
Wednesday, 31 July, 10 AM-5:30 PM
Thursday, 1 August, 10 AM-3:30 PM
STUDIO, CONTINUED

SOURCE FORM
Sam Blanchard  
Virginia Tech, School of Visual Arts
Jia-Bin Huang  
Virginia Tech, Electrical and Computer Engineering
Christopher B. Williams  
Viswanath Meenakshisundaram  
Joseph Kubalak  
Virginia Tech, Department of Mechanical Engineering
Sanket Lokegaonkar  
Virginia Tech, Department of Computer Science
Tianyu Ge  
Virginia Tech, School of Visual Arts

SQUARING CIRCLES
BC Biermann  
Heavy and Sons

STUDIO WORKSHOPS
SUNDAY, 28 JULY
LEDS AS SENSORS
2 PM - 3:30 PM
Paul Dietz  
Misapplied Sciences, Inc.
Ginger Alford  
Southern Methodist University

MONDAY, 29 JULY
SEQUENCER CINEMATOGRAPHY WITH UNREAL ENGINE
3:45 PM - 5:15 PM
G&I P&A
Luis Cataldi  
Epic Games

IMVERSE LIVEMAKER - CREATE AND COMBINE VOLUMETRIC MODELS INTO A COMPLETE 3D INTERACTIVE SCENE INSIDE VR
12 PM - 1:30 PM
G&I NT
Javier Bello Ruiz  
Robin Mange  
Benoit Perrin  
Inverse SA

CODE CRAFTING WITH TURTLESTITCH
3:45 PM - 5:15 PM
A&D NT
Ursula Wolz  
RiverSound Solutions, LLC
Michael Aschauer  
Andrea Mayr-Stalder  
turtlestitch.org
Arlene Marin  
RiverSound Solutions, LLC

TUESDAY, 30 JULY
CREATIVE BRAINSTORMING IN AFTER EFFECTS
10 AM - 11:30 AM
G&I P&A
Candice Weber  
Titmouse Animation

HANDS-ON: RAPID INTERACTIVE APPLICATION PROTOTYPING FOR MEDIA AND PERFORMING ARTS IN ILLIMITABLE SPACE
12 PM - 1:30 PM
A&D
Serguei Mokhov  
Concordia University; mDreams Pictures, Inc; CCIFF.ca
Sudhir Mudur  
Concordia University

SPACE AS INTERFACE: CREATING INTERACTIVE STREET ART
2 PM - 3:30 PM
A&D
BC Biermann  
Heavy and Sons; https://www.vxdlab.com

3D PRINTING ON FABRIC
3:45 PM - 5:15 PM
A&D NT
David Shorey  
Shorey Designs

KEYS
REGISTRATION LEVELS
- Full Conference Platinum (FP)  
- Full Conference One-Day (FOD)  
- Full Conference (F)  
- Select Conference (S)  
- Experiences (XP)  
- Exhibits (E)  
- Exhibitors (EX)  
- Business Symposium (B)

INTEREST AREAS
P&A Production & Animation  
R&E Research & Education  
A&D Arts & Design  
G&I Gaming & Interactive  
NT New Technologies  
Adaptive Tech  
Curated Content

RETURN TO TABLE OF CONTENTS
### WEDNESDAY, 31 JULY

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Time</th>
<th>Speakers</th>
<th>Interest Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>ADVANCED USE CASES FOR ANIMATION RIGGING IN UNITY</strong></td>
<td>10 AM - 11:30 AM</td>
<td>David Hunt, Olivier Dionne, Simon Bouvier-Zappa &lt;br&gt;Unity Technologies</td>
<td>P&amp;A</td>
</tr>
<tr>
<td></td>
<td><strong>TROUBLESHOOTING AND CLEANUP TECHNIQUES FOR 3D PRINTING</strong></td>
<td>12 PM - 1:30 PM</td>
<td>Lance Winkel &lt;br&gt;University of Southern California</td>
<td>A&amp;D, NT</td>
</tr>
<tr>
<td></td>
<td><strong>PHYSICS-BASED CHARACTER ANIMATION WITH CASCADEUR</strong></td>
<td>2 PM - 3:30 PM</td>
<td>Alexander Grishanin, Evgeniy Khapugin, Alexey Silantiev &lt;br&gt;Nekki Limited; Banzai Games</td>
<td>P&amp;A</td>
</tr>
<tr>
<td></td>
<td><strong>VOLUMETRIC LIGHTING AND EFFECTS IN UNREAL ENGINE 4</strong></td>
<td>3:45 PM - 5:15 PM</td>
<td>Tom Shannon &lt;br&gt;Epic Games</td>
<td>P&amp;A</td>
</tr>
</tbody>
</table>

### THURSDAY, 1 AUGUST

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Time</th>
<th>Speakers</th>
<th>Interest Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>HIGH-FIDELITY LIGHTING WITH UNITY’S HIGH-DEFINITION RENDER PIPELINES</strong></td>
<td>10 AM - 11:30 AM</td>
<td>Laurent Harduin &lt;br&gt;Unity Technologies</td>
<td>G&amp;I</td>
</tr>
<tr>
<td></td>
<td><strong>FUSION360 AND SKETCHBOOK AS PARTNERS FOR CONCEPT DEVELOPMENT</strong></td>
<td>12 PM - 1:30 PM</td>
<td>Jeffrey Smith &lt;br&gt;Autodesk</td>
<td>A&amp;D</td>
</tr>
<tr>
<td></td>
<td><strong>HIGH-FIDELITY LIGHTING WITH UNITY’S HIGH-DEFINITION RENDER PIPELINES</strong></td>
<td>10 AM - 11:30 AM</td>
<td>Laurent Harduin &lt;br&gt;Unity Technologies</td>
<td>G&amp;I</td>
</tr>
<tr>
<td></td>
<td><strong>FUSION360 AND SKETCHBOOK AS PARTNERS FOR CONCEPT DEVELOPMENT</strong></td>
<td>12 PM - 1:30 PM</td>
<td>Jeffrey Smith &lt;br&gt;Autodesk</td>
<td>A&amp;D</td>
</tr>
</tbody>
</table>

### KEYS

- **REGISTRATION LEVELS**
  - Full Conference Platinum (FP)
  - Full Conference One-Day (FOD)
  - Full Conference (F)
  - Business Symposium (B)
  - Exhibit (E)
  - Exhibitors (EX)
  - Experience (XP)

- **INTEREST AREAS**
  - Production & Animation (P&A)
  - Research & Education (R&E)
  - Arts & Design (A&D)
  - Gaming & Interactive (G&I)
  - New Technologies (NT)

- **Curated Content**

[RETURN TO TABLE OF CONTENTS]
SIGGRAPH Talks span topics across all of computer graphics and interactive techniques. These talks take the form of case studies, academic research, technical developments, improved pipeline tools, education and curriculum, professional development, or social commentary. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/talks/

Seating is on a first-come, first-served basis. Please arrive early for the talk you wish to attend.

SUNDAY, 28 JULY

BUILDING CHARACTER
10:45 AM-12:15 PM

Production & Animation
Research & Education
Arts & Design

Creating Photoreal Creatures that Audiences Can Connect With
Michael Gregory
Dan Seddon
Moving Picture Company

From Comic Book to Movie Screen: Achieving Symbiosis Between Rigging and Creature Effects for “Venom”
Charlie Banks
Marco Dambros
William Gabrielle
Erica Vigilante
Jesu R. Nieto
Sylvain Brugnot
Martin Prazak
DNEG

Recreating BoPeep for “Toy Story 4”
Mara MacMahon
George Nguyen
Tanja Krampfert
Mariana Galindo
Carrie Hobson
Patty Kihm
Becki Tower
Pixar Animation Studios

Porting Your Virtual Reality Game to Oculus Quest
Eugene Elkin
Survios, Inc.

VR/AR REAL MAGIC
10:45 AM-12:15 PM

Virtual Reality
Production & Animation

A Look Into Five Years of Locomotion in Virtual Reality
Alex Silkin
Survios, Inc.

Mica: A Photoreal Character for Mixed Reality
Nafees Bin Zafar
Jonathan Litt
James Bancroft
Sean Comer
Thomas Miller
Takashi Kuribayashi
Magic Leap

VR Theater Immersive Soundscape
Yao Wang
Sherry Li
ICTUS Audio

MAKING FACES
10:45 AM-12:15 PM

Production & Animation

Mesh Wrap Based on Affine-Invariant Coordinates
Fernando de Goes
Pixar Animation Studios

Muscle-Based Facial Retargeting with Anatomical Constraints
Matthew D. Cong
Industrial Light & Magic

Ronald Fedkiw
Stanford University, Industrial Light & Magic

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
**SUNDAY, 28 JULY**

**Facial Pipeline in Playmobil: The Movie**
Jeremy Ringard
Claude Levastre
ON Animation Studios

**The Beauty of Breaking Rhythms: Affective Robot Motion Design Using JoHa-Kyu of Bunraku Puppet**
Yang Chen
Ran Dong
Dongsheng Cai
The University of Tsukuba

Shinobu Nakagawa
Tomonari Higaki
The Osaka University of Arts

Nobuyoshi Asai
The University of Aizu

---

**CLASSIC ART, CUTTING EDGE**

**2 PM-3:30 PM**

**NT**

**P&A**

**The Making of “Age of Sail”**
John Kahrs
Boathouse Studios

Kevin Dart
Chromosphere LA

Cassidy Curtis
Google Spotlight Stories

Scot Stafford
Pollen Music

---

**Bone Mother: Making a 3D Printed Film**
Dale Hayward
See Creature Productions, National Film Board of Canada

---

**2D Animation in the VR Clouds: The Making of Disney’s “A Kite’s Tale”**
Bruce Wright
Michael Anderson
Angela McBride
Henrik Falt
Daniel Peixe
Tony DeRosa
Walt Disney Animation Studios

---

**SERIOUS VR**

**2 PM-3:30 PM**

**NT**

**P&A**

**Preserving Virtual Reality Artworks: A Museum Perspective**
Jack McConchie
Tom Ensom
Tate

---

**Experiences of Treating Phantom Limb Pain using Immersive Virtual Reality**
James Marsh
Stephen Pettifer
Cliff Richardson
The University of Manchester

Jai Kulkarni
Manchester University NHS Foundation Trust

---

**Immersivemote: Immersive Human- and Task-Aware Remote Operation**
Pietro Lungaro
Konrad Tollmar
Royal Institute of Technology - KTH

---

**Architecture Challenges in the Android 3D Graphics Stack**
Pau Baiget
Google

---

**SPECTACLE AND EVENTS**

**3:45 PM-5:15 PM**

**P&A**

**Childish Gambino’s Pharos – Real-Time Dome Projection for Live Concert**
Keith Miller
Weta Digital

---

**MONDAY, 29 JULY**

**ADAPTING TO WORKING TOGETHER**

**3:45 PM-5:15 PM**

**P&A**

**La Noria: Making A Dark Animated Film**
Carlos Baena
Nightwheel Pictures

---

**Enhancing Emotional Intelligence in Project Management**
Claudia Davis
Yale University

---

**THIS IS A-NOISE-ING**

**3:45 PM-5:15 PM**

**P&A**

**Machine-Learning Denoising in Feature Film Production**
Henrik D. Dahlberg
Industrial Light & Magic

David M. Adler
Walt Disney Animation Studios

Jeremy Newlin
Pixar Animation Studios

---

**KEYS**

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)
- New Technologies
- Adaptive Tech
- Curated Content

---

**RETURN TO TABLE OF CONTENTS**
MONDAY, 29 JULY

Sculpting Color Spaces
Yanli Zhao
Darryl Gouder
Rob Pieke
MPC R&D

Neural Pixel Error Detection
Erika Varis Doggett
Anna Wolak
The Walt Disney Company

Daphne Tsatsoulis
Nicholas McCarthy
Accenture

Boosting VFX Production with Deep Learning
Yanir Kleiman
Simon Pabst
Patrick Nagle
DNEG

TUESDAY, 30 JULY

HOW TO MAKE A WORLD
9 AM-10:30 AM

NT P&A
Cinematography: Into the Spider-Verse
David Morehead
Sony Pictures Animation, self

WINNING AT GAME PRODUCTION
9 AM-10:30 AM

NT R&E
A Scalable Real-Time Many-Shadowed-Light Rendering System
Bo Li
WB Games Montréal

Mortal Kombat 11: High Fidelity Cached Simulations in Real-Time
Jason Nadro
Matt Battaglia
Aren Voorhees
NetherRealm Studios

Why You Should(n’t) Build Your Own Game Engine
Andrés Rivela
Digital Bandit Studios Inc.

Practical Dynamic Lighting for Large-Scale Game Environments
Kyunghoon Cho
Kwanghyeoon Go
Daeh Kim
Pearl Abyss Corp

THREE
10:45 AM-12:15 PM

G&I
Foundational Principles & Technologies for the Metaverse
Tim Sweeney
Epic Games

KALEIDOSCOPE EYES - DISPLAYS AND TRICKS
10:45 AM-12:15 PM

R&E
Adaptive Environments with Parallel Reality Displays
Paul H. Dietz
Matt Lathrop
Misapplied Sciences, Inc.

Depth Boost: Extended Depth Reconstruction Capability on Volumetric Display
Yamato Miyashita
Yasuhiro Sawahata
Miwa Katayama
Kazuteru Komine
Japan Broadcasting Corporation

RETURN TO TABLE OF CONTENTS
TUESDAY, 30 JULY

From Light to Sound: Prisms and Auto-Zoom Lenses
Gianluca Memoli
Thomas J. Graham
Joshua T. Kybett
Arash Pouryazdan
University of Sussex

Visualization of Putting Trajectories in Live Golf Broadcasting
Masaki Takahashi
Takahito Ito
Hidehiko Okubo
Hideki Mitsumine
Japan Broadcasting Corporation (NHK), Science and Technology Research Laboratories

COMBUSTION
2 PM-3:30 PM
P&A R&E
Avengers: Endgame, A New Approach for Combustion Simulations
Gerardo Aguilera
John Johansson
Weta Digital

Physics-Based Combustion Simulation in Bifrost
Michael Nielsen
Konstantinos Stamatelos
Morten Bojsen-Hansen
Robert Bridson
Autodesk

Regeneration of Fluid Simulations for VFX: Distributed Non-Linear Fluid Re-Timing by Sparse Bi-Directional Advection-Diffusion
Ken Museth
Weta Digital

What Time Is It? Efficient and Robust FX Retiming Workflow For Spies in Disguise
Ravindra Dwivedi
Jon Barry
Sean C McDuffee
Blue Sky Studios

HERE COMES THE SUN
3:45 PM-5:15 PM
P&A

Practical Lighting on “Toy Story 4”
Yaa-Lirng Tu
Tim Babb
Hosuk Chang
William T. Reeves
Pixar Animation Studios

Light Pruning on “Toy Story 4”
Vaibhav Vavilala
Pixar

Streamlining IBL Workflows with Computer Vision and USD
Stefano Cieri
Alexander Schwank
DNEG

DeepLight: Learning Illumination for Unconstrained Mobile Mixed Reality
Chloe LeGendre
Wan-Chun Ma
Graham Fyffe
John Flynn
Laurent Charbonnel
Jay Busch
Paul Debevec
Google Inc.

WEDNESDAY, 31 JULY

GETTING NEW PIPES
9 AM-10:30 AM
P&A

A Portal for Managing Reviews and Beyond
Danny Rerucha
Tommy Zhu
Andy Schott
Marley Gilb
Tracy Priest
Jennifer Brola
Blessan Abraham
Mark McGuire
Blue Sky Studios

Building Modern VFX Infrastructure
Natasha Kelkar
MPC

Conduit: A Modern Pipeline for the Open Source World
Oliver Staebuli
Tim Hoff
Ryan Bland
Rebecca Hallac
Josh Smeltzer
Chris Rydalch
Karyn B. Monschein
Mark McGuire
Blue Sky Studios

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
- Production & Animation (P&A)
- Research & Education (R&E)
- Arts & Design (A&D)
- Gaming & Interactive (G&I)
- New Technologies (NT)
WEDNESDAY, 31 JULY

Integrate USD the Nodal Way, a Visual VFX Pipeline
Robin De Lillo
Guillaume Laforge
Rodeo FX

ELEANOR “RIGGING”-BY
2 PM-3:30 PM
P&A
Hierarchy Models: Building Blocks for Procedural Rigging
Sandy Kao
Michael Hutchinson
Kevin Ochs
Gilbert Davoud
Alex Powell
DreamWorks Animation

Flap Flap Away - Animation Cycle Multiplexing
Sandy Kao
Simon Otto
DreamWorks Animation

Sliding the Pieces into Place: Rigging the Pigeons of Spies in Disguise
Ferris Webby
Todd Hill
James Gu
Ozgur Aydogdu
Blue Sky Studios

Fast, Interpolationless Character Animation Through “Ephemeral” Rigging
Raf Anzovin
Raf Anzovin Productions

THURSDAY, 1 AUGUST

PERCEPTION IN RENDERING & HARDWARE
9 AM-10:30 AM

Autofocals: Evaluating Gaze-Contingent Eyeglasses for Presbyopes
Nitish Padmanaban
Robert Konrad
Gordon Wetzstein
Stanford University

Gaze-Contingent Ocular Parallax Rendering for Virtual Reality
Robert Konrad
Anastasios Nikolaos Angelopoulos
Gordon Wetzstein
Stanford University

Foveated Displays: Toward Classification of the Emerging Field
Josef Spjut
Ben Boudaoud
NVIDIA

DeepFovea: Universal Neural Reconstruction for Foveated Rendering and Video Compression using Learned Statistics of Natural Videos
Anton Kaplanyan
Facebook Reality Labs

HERE COMES THE GROOM AND RIG
10:45 AM-12:35 PM
P&A
Holding the Shape in Hair Simulation
Hayley Iben
Jacob Brooks
Christopher Bolwyn
Pixar Animation Studios

Hummingbird: DreamWorks Feather System
Nicholas Augello
David Tonnesen
Arunachalam Somasundaram
DreamWorks Animation

Mesh-Driven Generation and Animation of Groomed Feathers
Rasmus Haapaaja
Christoph Genzwuerker
MPC

Grasshopper: DreamWorks Environmental Simulation System
Chris De St. Jeor
Chris Michael
Arunachalam Somasundaram
Kurt Phillips
DreamWorks Animation

Optimizing Rig Manipulation with GPU and Parallel Evaluation
Andy Lin
John Kahwaty
Walter Yoder
Gene S. Lee
David Surowiec
Walt Disney Animation Studios

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Business Symposium (B)
- Exhibitors (EX)
- Exhibits (E)
- Experiences (XP)

INTEREST AREAS
- Production & Animation
- Research & Education
- Arts & Design
- Gaming & Interactive
- New Technologies
- Adaptive Tech

#SIGGRAPH2019 | SIGGRAPH.ORG
THURSDAY, 1 AUGUST

ALL TOGETHER NOW – CROWDS
2 PM-3:30 PM

NT P&A

Directable Stadium Crowds from Image Based Modeling for "Bohemian Rhapsody"
Ted Waine
DNEG

Optimizing Large Scale Crowds in Ralph Breaks the Internet
Le Joyce Tong
Josh Richards
Moe El-Ali
Tuan Nguyen
Walt Disney Animation Studios

Creating Ralphzilla: Moshpit, Skeleton Library and Automation Framework
Dong Joo Byun
Alberto Lucero Ros
Alexander Moaveni
Marc Bryant
Le Tong
Moe El-Ali
Walt Disney Animation Studios

A Ragdoll-Less Approach to Physical Animations of Characters in Vehicles
Hyojong Shin
Ubisoft Reflections

LUCY IN THE SKY WITH DIAMONDS – PROCESSING VISUALS
3:45 PM-5:15 PM

R&E

A Low-Discrepancy Sampler that Distributes Monte Carlo Errors as a Blue Noise in Screen Space
Eric Heitz
Laurent Belcour
Unity Technologies

Global Adaptive Sampling Hierarchies in Production Ray Tracing
Keith Jeffery
DreamWorks Animation

Machine Learning for Multiple Scattering
Feng Xie
Stanford University

Taming the Shadow Terminator
Matt Jen-Yuan Chiang
Yining Karl Li
Brent Burley
Walt Disney Animation Studios

PRACTICAL FLUIDS
3:45 PM-5:15 PM

P&A

A Practical Guide to Thin Film and Drips Simulation
Alexey Stomakhin
Andrew Moffat
Gary Boyle
Weta Digital

InstaFalls: How To Train Your Waterfalls
Baptiste van Opstal
Youxi Woo
Amaury Aubel
DreamWorks Animation

Procedural Approach to Animation Driven Effects for "Avengers: Endgame"
Tobias Mack
Ashraf Ghoniem
Ruben Mayor
Gerardo Aguilera
Weta Digital

The Rigid Body and Fluid Dynamics of LAIKA’s "Missing Link"
David Horsley
Peter Stua
LAIKA LLC

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Business Symposium (B)
- Exhibitors (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
P&A Production & Animation
R&E Research & Education
A&D Arts & Design
G&I Gaming & Interactive
NT New Technologies
The premier venue for disseminating and discussing new scholarly work in computer graphics technology and interactive techniques, Technical Papers allows attendees to witness the most visionary, innovative, and inspiring submissions and interact with the authors through Q&A. For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/technical-papers/.

Technical Papers are published as a special issue of ACM Transactions on Graphics. In addition to papers selected by the SIGGRAPH 2019 Technical Papers Committee, the conference presents papers that have been published in ACM Transactions on Graphics during the past year.

Select Number of Technical Paper Authors to Present Posters at SIGGRAPH 2019

New this year, a select number of paper authors will be participating in the Poster Program. Check out their poster to get a taste of their research and then attend their presentation. Look for a list of these posters by visiting the Poster Program: https://s2019.siggraph.org/conference/programs-events/posters/

Seating is on a first-come, first-served basis. Please arrive early for the papers you wish to attend.

**TECHNICAL PAPERS FAST FORWARD**

**Sunday, 28 July, 6 PM-8 PM**


**MONDAY, 29 JULY**

**1. IMAGE SCIENCE**

**10:45 AM-12:35 PM**

**R&E**

**FAST FORWARD**

**Sunday, 28 July, 6 PM-8 PM**


**1. IMAGE SCIENCE**

**10:45 AM-12:35 PM**

**R&E**

**Hyperparameter Optimization in Black-Box Image Processing Using Differentiable Proxies**

Ethan Tseng  
Felix Yu  
Yuting Yang  
Princeton University

Fahim Mannan  
Karl St. Arnaud  
Algolux

Derek Nowrouzezahrai  
McGill University

Jean-Francois Lalonde  
Université Laval

Felix Heide  
Princeton University, Algolux

**Handheld Multi-Frame Super-Resolution**

Bartłomiej Wróński  
Ignacio García-Dorado  
Manfred Ernst  
Damien Kelly  
Michael Krainin  
Chia-Kai Liang  
Marc Levoy  
Peyman Milanfar  
Google Inc.

**A Unified Framework for Compression and Compressed Sensing of Light Fields and Light Field Videos**

Ehsan Miandji  
Saghi Hajisharif  
Jonas Unger  
Linköping University
MONDAY, 29 JULY

Local Light Field Fusion: Practical View Synthesis With Prescriptive Sampling Guidelines
Ben Mildenhall
Pratul P. Srinivasan
University of California, Berkeley
Rodrigo Ortiz-Cayon
Fyusion Inc.
Nima Khademi Kalantari
Texas A&M University
Ravi Ramamoorthi
University of California, San Diego
Ren Ng
University of California, Berkeley
Abhishek Kar
Fyusion Inc.

Synthetic Defocus and Look-Ahead Autofocus for Casual Videography
Cecilia Zhang
University of California, Berkeley
Kevin Matzen
Facebook, Cornell University
Vivien Nguyen
Dillon Yao
University of California, Berkeley
You Zhang
Chapman University Dodge College of Film and Media Arts
Ren Ng
University of California, Berkeley

2. SHAPE SCIENCE
10:45 AM-12:35 PM

Visual Smoothness of Polyhedral Surfaces
Davide Pellis
Martin Kilian
Felix Dellingler
TU Wien
Johannes Wallner
TU Graz
Helmut Pottmann
King Abdullah University of Science and Technology

Progressive Embedding
Hanzhao Shen
Zhongshi Jiang
Denis Zorin
Daniele Panozzo
New York University

Atlas Refinement With Bounded Packing Efficiency
Hao-Yu Liu
Xiao-Ming Fu
Chunyang Ye
Shuangming Chai
Ligang Liu
University of Science and Technology of China

Weaving Geodesic Foliations
Josh Vekhter
The University of Texas at Austin; Foolish Products, LLC
Jiacheng Zhuo
Luisa F. Gil Fandino
Qixing Huang
Etienne Vouga
The University of Texas at Austin

Gaussian-Product Subdivision Surfaces
Reinhold Preiner
Institute of Computer Graphics and Knowledge Visualization, Graz University of Technology
Tammy Boubekeur
LTCL, Telecom ParisTech, Institut Polytechnique de Paris
Michael Wimmer
Institute of Visual Computing & Human-Centered Technology, TU Wien

3. LIGHT SCIENCE
10:45 AM-12:35 PM

Hierarchical Russian Roulette for Vertex Connections
Yusuke Tokuyoshi
Square Enix Co., Ltd.
Takahiro Harada
Advanced Micro Devices, Inc.

Optimal Multiple Importance Sampling
Ivo Kondapaneni
Charles University, Prague
Petr Vévoda
Charles University, Prague; Render Legion, a. s.
Pascal Grittmann
Saarland University, Saarbrücken
Tomáš Skřivan
Institute of Science and Technology Austria
Philipp Slusallek
German Research Center for Artificial Intelligence; Saarland University, Saarbrücken
Jaroslav Klivánek
Charles University, Prague; Render Legion, a. s.
**MONDAY, 29 JULY**

**Ellipsoidal Path Connections for Time-Gated Rendering**
Adithya Pediredla  
Rice University, Carnegie Mellon University

Ashok Veeraraghavan  
Rice University

Ioannis Gkioulekas  
Carnegie Mellon University

---

**A Monte Carlo Framework for Rendering Speckle Statistics in Scattering Media**
Chen Bar  
Marina Alterman  
Technion

Ioannis Gkioulekas  
Carnegie Mellon University

Anat Levin  
Technion

---

**Rodent: Generating Renderers Without Writing a Generator**
Arsène Pérad-Gayot  
Saarland University

Richard Membarth  
DFKI, Saarland University

Roland Leißa  
Sebastian Hack  
Saarland University

Philipp Slusallek  
DFKI, Saarland University

---

**TUESDAY, 30 JULY**

**4. CAPTURE CONTROL**

**9 AM-10:30 AM**

- **G&A**  
  **Deformation Capture via Soft and Stretchable Sensor Arrays**
  Oliver Glauser  
  ETH Zurich

  Daniele Panozzo  
  New York University

  Otmar Hilliges  
  Olga Sorkine-Hornung  
  ETH Zurich

---

**Interactive Hand Pose Estimation Using a Stretch-Sensing Soft Glove**

- **G&A**  
  **Deformation Capture via Soft and Stretchable Sensor Arrays**
  Oliver Glauser  
  ETH Zurich

  Shihao Wu  
  ETH Zurich

  Daniele Panozzo  
  New York University

  Otmar Hilliges  
  Olga Sorkine-Hornung  
  ETH Zurich

---

**Learning to Fly: Computational Controller Design for Hybrid UAVs With Reinforcement Learning**

- Jie Xu  
  Tao Du  
  Michael Foshey  
  Beichen Li  
  Massachusetts Institute of Technology

- Bo Zhu  
  Dartmouth College

- Adriana Schulz  
  University of Washington

- Wojciech Matusik  
  Massachusetts Institute of Technology

---

**Designing Chain Reaction Contraptions From Causal Graphs**

- Robin Roussel  
  University College London

- Marie-Paule Cani  
  École Polytechnique

- Jean-Claude Léon  
  Grenoble INP

- Niloy J. Mitra  
  University College London

---

**TECHNICAL PAPERS, CONTINUED**

---

**KEYS**

**REGISTRATION LEVELS**

- **Full Conference Platinum (FP)**
- **Full Conference One-Day (FOD)**
- **Full Conference (F)**
- **Select Conference (S)**

- **Experiences (XP)**
- **Exhibits (E)**
- **Exhibitors (EX)**
- **Business Symposium (B)**

**INTEREST AREAS**

- **P&A** Production & Animation
- **R&E** Research & Education
- **A&D** Arts & Design
- **G&I** Gaming & Interactive
- **NT** New Technologies

---

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
TUESDAY, 30 JULY

5. ADVANCED VOLUME RENDERING
9 AM-10:30 AM

R&E
Volume Path Guiding Based on Zero-Variance Random Walk Theory
Sebastian Herholz
University of Tübingen
Yangyang Zhao
McGill University
Oskar Elek
Charles University, University of California, Santa Cruz
Derek Nowrouzezahrai
McGill University
Hendrik P. A. Lensch
University of Tübingen
Jaroslav Krivanek
Charles University

A Null-Scattering Path Integral Formulation of Light Transport
Bailey Miller
Dartmouth College
Iliyan Georgiev
Autodesk
Wojciech Jarosz
Dartmouth College

Fractional Gaussian Fields for Modeling and Rendering of Spatially-Correlated Media
Jie Guo
Yanjun Chen
Bingyang Hu
State Key Lab for Novel Software Technology, Nanjing University
Ling-Qi Yan
University of California, Santa Barbara
Yanwen Guo
Yuntao Liu
State Key Lab for Novel Software Technology, Nanjing University

Photon Surfaces for Robust, Unbiased Volumetric Density Estimation
Xi Deng
Shaojie Jiao
Benedikt Bitterli
Wojciech Jarosz
Dartmouth College

6. HUMAN CAPTURE AND MODELING
10:45 AM-12:35 PM

G&I R&E
Creating Impactful Characters: Correcting Human Impact Accelerations Using High-Rate IMUs in Dynamic Activities
Calvin Kuo
Ziheng Liang
Ye Fan
University of British Columbia
University of British Columbia; Vital Mechanics Research, Inc.

InteractionFusion: Real-Time Reconstruction of Hand Poses and Deformable Objects in Hand-Object Interactions
Hao Zhang
Zi-Hao Bo
Jun-Hai Yong
Feng Xu
Tsinghua University

Real-Time Pose and Shape Reconstruction of Two Interacting Hands With a Single Depth Camera
Franziska Mueller
Max Planck Institute for Informatics
Micah Davis
Universidad Rey Juan Carlos
Florian Bernard
Oleksandr Sotnychenko
Max Planck Institute for Informatics
Micheal Verschoor
Miguel A. Otaduy
Dan Casas
Universidad Rey Juan Carlos
Christian Theobalt
Max Planck Institute for Informatics

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)
- Technical Papers (T)

INTEREST AREAS
- P&A Production & Animation
- R&E Research & Education
- A&D Arts & Design
- G&I Gaming & Interactive
- NT New Technologies
TUESDAY, 30 JULY

Accurate Markerless Jaw Tracking for Facial Performance Capture
Gaspard Zoss
DisneyResearch|Studios, ETH Zurich
Thabo Beeler
DisneyResearch|Studios
Markus Gross
DisneyResearch|Studios, ETH Zurich
Derek Bradley
DisneyResearch|Studios

7. MESHING
10:45 AM-12:35 PM

Parametrization Quantization With Free Boundaries for Trimmed Quad Meshing
Max Lyon
RWTH Aachen University
Marcel Campen
Osnabrück University
David Bommes
University of Bern
Leif Kobbelt
RWTH Aachen University

Finding Hexahedrizations for Small Quadrangulations of the Sphere
Kilian Verhetsel
Jeanne Pellerin
Jean-François Remacle
Université catholique de Louvain

Harmonic Triangulations
Marc Alexa
TU Berlin

Navigating Intrinsic Triangulations
Nicholas Sharp
Carnegie Mellon University
Yousuf Soliman
Caltech
Keenan Crane
Carnegie Mellon University

8. HIGH PERFORMANCE RENDERING
10:45 AM-12:35 PM

Blockwise Multi-Order Feature Regression for Real-Time Path Tracing Reconstruction
Matias Koskela
Tampere University
Kalle Immonen
Vincit
Markku Mäkinen
Alessandro Foi
Tampere University
Timo Viitanen
Nvidia
Pekka Jääskeläinen
Heikki Kultala
Jarmo Takala
Tampere University

Iterative Depth Warping
Sungkil Lee
Younguk Kim
Sungkyunkwan University
Elmar Eisemann
Delft University of Technology

Beyond Trilinear Interpolation: Higher Quality for Free
Balázs Csébfalvi
Budapest University of Technology and Economics
9. PHOTO SCIENCE
2 PM-3:30 PM
R&E

Semantic Photo Manipulation With a Generative Image Prior
David Bau
Massachusetts Institute of Technology, MIT-IBM Watson AI Lab
Hendrik Strobelt
IBM Research, MIT-IBM Watson AI Lab
William Peebles
Jonas Wulff
Massachusetts Institute of Technology
Bolei Zhou
The Chinese University of Hong Kong
Jun-Yan Zhu
Antonio Torralba
Massachusetts Institute of Technology

Progressive Color Transfer With Dense Semantic Correspondences
Mingming He
Hong Kong University of Science and Technology
Jing Liao
City University of Hong Kong
Dongdong Chen
University of Science and Technology of China
Lu Yuan
Microsoft AI Perception and Mixed Reality
Pedro Sander
Hong Kong University of Science and Technology

The Face of Art: Landmark Detection and Geometric Style in Portraits
Jordan Yaniv
Yael Newman
Tel Aviv University
Ariel Shamir
The Interdisciplinary Center

Distortion-Free Wide-Angle Portraits on Camera Phones
YiChang Shih
Google Inc.
Wei-Sheng Lai
Chia-Kai Liang
Google Inc.; University of California, Merced

10. TEXTILES AND FABRICATION
2 PM-3:30 PM
R&E

Wallpaper Pattern Alignment Along Garment Seams
Katja Wolff
Olga Sorkine-Hornung
ETH Zurich

Visual Knitting Machine Programming
Vidya Narayanan
Carnegie Mellon University
Kui Wu
Cem Yuksel
University of Utah
James McCann
Carnegie Mellon University
TUESDAY, 30 JULY

Knittable Stitch Meshes
Kui Wu
Hannah Swan
Cem Yuksel
University of Utah, School of Computing

Computational Peeling Art Design
Hao Liu
Xiao-Teng Zhang
Xiao-Ming Fu
Zhi-Chao Dong
Ligang Liu
University of Science and Technology of China

11. NEURAL RENDERING
3:45 PM-5:35 PM

Neural Volumes: Learning Dynamic Renderable Volumes From Images
Stephen Lombardi
Facebook, Inc.

Deferred Neural Rendering: Image Synthesis Using Neural Textures
Justus Thies
Technical University of Munich

Neural Rendering and Reenactment of Human Actor Videos
Lingjie Liu
University of Hong Kong
Weipeng Xu
Max Planck Institute of Informatics
Michael Zollhoefer
Stanford University
Hyeongwoo Kim
Florian Bernard
Marc Habermann
Max Planck Institute of Informatics
Wenping Wang
University of Hong Kong
Christian Theobalt
Max Planck Institute of Informatics

Text-Based Editing of Talking-Head Video
Ohad Fried
Stanford University
Ayush Tewari
Max Planck Institute for Informatics
Michael Zollhoefer
Stanford University
Adam Finkelstein
Princeton University
Eli Shechtman
Adobe
Dan B. Goldman
Adobe

12. DEFORMATION AND FEM
3:45 PM-5:35 PM

Analytic Eigensystems for Isotropic Distortion Energies
Breannan Smith
Facebook Reality Labs
Fernando de Goes
Theodore Kim
Pixar Animation Studios

KEYS
REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
P&A Production & Animation
R&E Research & Education
A&D Arts & Design
G&I Gaming & Interactive
NT New Technologies
**TUESDAY, 30 JULY**

**Anisotropic Elasticity for Inversion-Safety and Element Rehabilitation**
Theodore Kim  
Fernando de Goes  
Hayley Iben  
Pixar Animation Studios

**Decomposed Optimization Time Integrator for Large-Step Elastodynamics**
Minchen Li  
University of Pennsylvania, Adobe Research  
Ming Gao  
University of Pennsylvania  
Timothy Langlois  
Adobe Research  
Chenfanfu Jiang  
University of Pennsylvania  
Danny M. Kaufman  
Adobe Research

**Affine Interpolation in a Lie Group Framework**
Sumukh Bansal  
Aditya Tatu  
Dhirubhai Ambani Institute of Information and Communication Technology Gandhinagar

**Poly-Spline Finite Element Method**
Teseo Schneider  
Jérémie Dumas  
Xifeng Gao  
New York University  
Mario Botsch  
Bielefeld University  
Daniele Panozzo  
Denis Zorin  
New York University

**WEDNESDAY, 31 JULY**

**13. LEARNING TO MOVE**
9 AM-10:30 AM

**Synthesis of Biologically Realistic Human Motion Using Joint Torque Actuation**
Yifeng Jiang  
Georgia Institute of Technology  
Tom Van Wouwe  
Friedl De Groote  
KU Leuven  
Karen Liu  
Georgia Institute of Technology

**Scalable Muscle-Actuated Human Simulation and Control**
Seunghwan Lee  
Seoul National University  
Moonseok Park  
Kyungmin Lee  
Seoul National University Bundang Hospital  
Jehee Lee  
Seoul National University

**Physics-Based Full-Body Soccer Motion Control for Dribbling and Shooting**
Seokpyo Hong  
Korea Advanced Institute of Science and Technology  
Daseong Han  
Handong Global University  
Kyungmin Cho  
Korea Advanced Institute of Science and Technology  
Joseph S. Shin (formerly Sung Yong Shin)  
Korea Advanced Institute of Science and Technology, Handong Global University  
Junyong Noh  
Korea Advanced Institute of Science and Technology

**Learning Character-Agnostic Motion for Motion Retargeting in 2D**
Kfir Aberman  
Tel-Aviv University, AICFVE, Beijing Film Academy  
Rundi Wu  
Peking University  
Dani Lischinski  
The Hebrew University of Jerusalem  
Baoquan Chen  
Peking University  
Daniel Cohen-Or  
Tel-Aviv University
### Wednesday, 31 July

#### 14. Relighting and View Synthesis

9 AM-10:30 AM

**R&E**

Deep View Synthesis from Sparse Photometric Images

Zexiang Xu  
Sai Bi  
*University of California, San Diego*

Kalyan Sunkavalli  
Sunil Hadap  
Adobe Research

Hao Su  
Ravi Ramamoorthi  
*University of California, San Diego*

---

Deep Reflectance Fields - High-Quality Facial Reflectance Field Inference from Color Gradient Illumination

Abhimitra Meka  
Google, Max Planck Institute for Informatics

Christian Haene  
Rohit Pandey  
Google

Michael Zollhöfer  
Stanford University

Sean Fanello  
Graham Fyffe  
Adarsh Kowdle  
Xueming Yu  
Jay Busch  
Jason Dourarian  
Peter Denny  
Sofen Bouaziz  
Andrea Tagliasacchi  
Peter Lincoln  
Matt Whalen  
Geoff Harvey  
Jonathan Taylor  
Shahram Izadi  
Paul Debevec  
Google

Christian Theobalt  
Max Planck Institute for Informatics

Julien Valentin  
Christoph Rhemann  
Google

---

Multi-View Relighting Using a Geometry-Aware Network

Julien Philip  
*Inria, Université Côte d’Azur*

Michael Gharbi  
Adobe

Tinghui Zhou  
Alexei Efros  
*University of California, Berkeley*

George Drettakis  
*Inria, Université Côte d’Azur*

---

Single Image Portrait Relighting

Tiancheng Sun  
*University of California, San Diego*

Jonathan T. Barron  
Yun-Ta Tsai  
Google Research

Zexiang Xu  
*University of California, San Diego*

Xueming Yu  
Graham Fyffe  
Christoph Rhemann  
Jay Busch  
Paul Debevec  
Google

Ravi Ramamoorthi  
*University of California, San Diego*
WEDNESDAY, 31 JULY

15. FABRICATION
10:45 AM–12:35 PM

R&E

LineUp: Computing Chain-based Physical Transformation

Minjing Yu
Zipeng Ye
Yong-Jin Liu
Tsinghua University

Ying He
Nanyang Technological University

Charlie C.L. Wang
The Chinese University of Hong Kong

Surface2Volume: Surface Segmentation Conforming Assemblable Volumetric Partition

Chritiano Araujo
University of British Columbia

Daniela Cabiddu
Marco Attene
Marco Livesu
CNR-IMATI Genova

Nicholas Vining
Alla Sheffer
University of British Columbia

CurviSlicer: Slightly Curved Slicing for 3-axis printers

Jimmy Etienne
Université de Lorraine, Inria

Nicolas Ray
Inria

Daniele Panozzo
Courant Institute of Mathematical Sciences

Samuel Hornus
Inria

Charlie C.L. Wang
The Chinese University of Hong Kong

Jonas Martinez-Bayona
Inria

Sara McMains
University of California, Berkeley

Marc Alexa
TU Berlin

Brian Wyvill
University of Victoria, BC

Sylvain Lefebvre
Inria

Star-Shaped Metrics for Mechanical Metamaterial Design

Jonàs Martínez
Mélina Skouras
Inria

Christian Schumacher
ETH Zürich

Samuel Hornus
Sylvain Lefebvre
Inria

Bernhard Thomaszewski
Université de Montréal

X-Shells: A New Class of Deployable Beam Structures

Julian Panetta
Mina Konaković-Luković
Florin Isvoranu
EPFL

Etienne Bouleau
INGENI SA Genève

Mark Pauly
EPFL

16. SCENE AND OBJECT RECONSTRUCTION
10:45 AM–12:35 PM

R&E

Plan3D: Viewpoint and Trajectory Optimization for Aerial Multi-View Stereo Reconstruction

Benjamin Hepp
Google, ETH Zurich - Computer Science

Matthias Niessner
Technical University of Munich

Otmar Hilliges
ETH Zurich

KEYS

REGISTRATION LEVELS

□ Full Conference Platinum (FP) ★ Full Conference One-Day (FOD) ● Full Conference (F)
 ▲ Experiences (XP) ● Exhibits (E) + Exhibitors (EX) ○ Business Symposium (B)

INTEREST AREAS

P&A Production & Animation  R&E Research & Education  A&D Arts & Design  G&I Gaming & Interactive  NT New Technologies

RETURN TO TABLE OF CONTENTS

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
WEDNESDAY, 31 JULY

Multi-Robot Collaborative Dense Scene Reconstruction
Siyang Dong
Shandong University
Kai Xu
National University of Defense Technology
Qiang Zhou
Shandong University
Andrea Tagliasacchi
University of Victoria
Shiqing Xin
Shandong University
Matthias Nießner
Technical University of Munich
Baoquan Chen
Peking University

Surface Reconstruction Based on Modified Gauss Formula
Wenjia Lu
Zuojiang Shi
Jian Sun
Bin Wang
Tsinghua University

17. TRANSPORT: PARALLEL AND OPTIMAL
10:45 AM-12:35 PM
R&E
Symmetric Moving Frames
Etienne Corman
University of Toronto
Keenan Crane
Carnegie Mellon University

Optimal Transport-Based Polar Interpolation of Directional Fields
Justin Solomon
MIT
Amir Vaxman
Utrecht University

The Vector Heat Method
Nicholas Sharp
Carnegie Mellon University
Yousuf Soliman
California Institute of Technology
Keenan Crane
Carnegie Mellon University

Vectorization of Line Drawings via PolyVector Fields
Mikhail Bessmeltsev
Université de Montréal, Informatique et de recherche opérationnelle
Justin Solomon
Massachusetts Institute of Technology - CSAIL

SPOT: Sliced Partial Optimal Transport
Nicolas Bonneel
David Coeurjolly
CNRS, Univ. Lyon

A Symmetric Objective Function for ICP
Szymon Rusinkiewicz
Princeton University

Warp-and-Project Tomography for Rapidly Deforming Objects
Guangming Zang
Ramzi Idouhghi
Ran Tao
Gilles Lubineau
Peter Wonka
Wolfgang Heidrich
KAUST

18. OFF THE DEEP END
2 PM-3:30 PM
R&E
MeshCNN: A Network with an Edge
Rana Hanocka
Amir Hertz
Noa Fish
Raja Giryes
Tel Aviv University
Shachar Fleishman
Amazon
Daniel Cohen-Or
Tel Aviv University

**INTEREST AREAS**

- **P&A**: Production & Animation
- **R&E**: Research & Education
- **A&D**: Arts & Design
- **G&I**: Gaming & Interactive
- **NT**: New Technologies

**REGISTRATION LEVELS**

- **FP**: Full Conference Platinum
- **F**: Full Conference
- **FOD**: Full Conference One-Day
- **E**: Exhibitors
- **EX**: Exhibitors (EX)
- **XP**: Experiences (XP)
- **B**: Business Symposium

**KEYS**

- **REGISTRATION**: Full Conference Platinum (FP) Full Conference One-Day (FOD) Full Conference (F) Select Conference (S)
- **LEVELS**: Experiences (XP) Exhibitors (E) Exhibitors (EX) Business Symposium (B)
WEDNESDAY, 31 JULY

SAGNet: Structure-Aware Generative Network for 3D-Shape Modeling
Zhijie Wu
Xiang Wang
Di Lin
Shenzhen University
Dani Lischinski
The Hebrew University of Jerusalem
Daniel Cohen-Or
Shenzhen University, Tel Aviv University
Hui Huang
Shenzhen University

GRAINS: Generative Recursive Autoencoders for INdoor Scenes
Manyi Li
Shandong University, Simon Fraser University
Akshay Gadi Patil
Simon Fraser University
Kai Xu
National University of Defense Technology School of Computer, AICFVE Beijing Film Academy
Siddhartha Chaudhuri
Adobe Research, IIT Bombay
Owais Khan
IIT Bombay
Ariel Shamir
The Interdisciplinary Center, Herzalia Computer Science
Changhe Tu
Shandong University
Baoquan Chen
Peking University
Daniel Cohen-Or
Tel Aviv University
Hao Zhang
Simon Fraser University

iMapper: Interaction-Guided Scene Mapping from Monocular Videos
Aron Monszpart
University College London, Niantic
Paul Guerrero
University College London
Duygu Ceylan
Adobe
Ersin Yumer
Uber ATG, Adobe
Niloy Mitra
University College London

19. FLUIDS I
2 PM-3:30 PM

Interlinked SPH Pressure Solvers for Strong Fluid-Rigid Coupling
Christoph Gissler
Andreas Peer
University of Freiburg, FIFTY2 Technology GmbH
Stefan Band
University of Freiburg
Jan Bender
RWTH Aachen University
Matthias Teschner
University of Freiburg

On the Accurate Large-Scale Simulation of Ferrofluids
Libo Huang
Torsten Hädrich
Dominik L. Michels
KAUST

KEYS

REGISTRATION LEVELS
[Full Conference Platinum (FP)] [Full Conference One-Day (FOD)] [Full Conference (F)] [Select Conference (S)]
[Experiences (XP)] [Exhibits (E)] [Exhibitors (EX)] [Business Symposium (B)]

INTEREST AREAS
P&As Production & Animation
R&Es Research & Education
A&Ds Arts & Design
G&Is Gaming & Interactive
NTs New Technologies
**Perceptual Rasterization for Head-mounted Display Image Synthesis**
Sebastian Friston  
Tobias Ritschel  
Anthony Steed  
*University College London*

**Luminance-Contrast-Aware Foveated Rendering**
Okan Tarhan Tursun  
*Max Planck Institute for Informatics*

**Mixing Sauces: A Viscosity Blending Model for Shear Thinning Fluids**
Kentaro Nagasawa  
Takayuki Suzuki  
The University of Tokyo

**Foveated AR: Dynamically-Foveated Augmented Reality Display**
Jonghyun Kim  
*NVIDIA*

**SurfaceBrush: From Virtual Reality Drawings to Manifold Surfaces**
Enrique Rosales  
University of British Columbia, Universidad Panamericana

**Vidgets: Modular Mechanical Widgets for Mobile Devices**
Chang Xiao  
Columbia University

**Tangent-Space Optimization for Interactive Animation Control**
Loïc Ciccone  
ETH Zurich

**Vibration-Minimizing Motion Retargeting for Robotic Characters**
Shayan Hoshyari  
Disney Research, University of British Columbia

---

**Registration Levels**
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)
- New Technologies

**Keys**

**Interest Areas**
- Production & Animation (P&A)
- Research & Education (R&E)
- Arts & Design (A&D)
- Gaming & Interactive (G&I)
- New Technologies (NT)
WEDNESDAY, 31 JULY

Puppet Master: Robotic Animation of Marionettes
Simon Zimmermann
ETH Zurich

Roi Poranne
ETH Zurich, University of Haifa

James Bern
Stelian Coros
ETH Zurich

Non-Smooth Newton Methods for Deformable Multi-Body Dynamics
Miles Macklin
NVIDIA, University of Copenhagen - Computer Science

Kenny Erleben
University of Copenhagen - Computer Science

Matthias Müller
Nuttapong Chentanez
Stefan Jeschke
Viktor Makoviuch
NVIDIA

RedMax: Efficient & Flexible Approach for Articulated Dynamics
Ying Wang
Nicholas J. Weidner
Margaret A. Baxter
Yura Hwang
Texas A&M University

Danny M. Kaufman
Adobe Research

Shinjiro Sueda
Texas A&M University

22. MAPS AND OPERATORS
3:45 PM-5:35 PM

Functional Characterization of Deformation Fields
Etienne Corman
University of Toronto

Maks Ovsjanikov
LIx, École Polytechnique, CNRS

Spectral Coarsening of Geometric Operators
Hsueh-Ti Derek Liu
Alec Jacobson
University of Toronto

Maks Ovsjanikov
École Polytechnique

Steklov Spectral Geometry for Extrinsic Shape Analysis
Yu Wang
Massachusetts Institute of Technology

Mirela Ben-Chen
Technion - Israel Institute of Technology

Iosif Polterovich
Université de Montréal

Justin Solomon
Massachusetts Institute of Technology

Tensor Maps for Synchronizing Heterogeneous Shape Collections
Qixing Huang
Zhenxiao Liang
UT Austin

Haoyun Wang
Tsinghua University

Simiao Zuo
Chandrait Bajaj
UT Austin

Reversible Harmonic Maps between Discrete Surfaces
Danielle Ezuz
Technion Israel Institute of Technology

Justin Salomon
Massachusetts Institute of Technology

Mirela Ben-Chen
Technion - Israel Institute of Technology

THURSDAY, 1 AUGUST

23. VIDEO
9 AM-10:30 AM

Stylizing Video by Example
Ondřej Jamriška
Šárka Sochorová
Ondřej Texler
CTU in Prague, FEE

Michal Lukáč
Jakub Fišer
Jingwan Lu
Eli Shechtman
Adobe Research

Daniel Šykora
CTU in Prague, FEE
24. FABRICATED RESULTS
9 AM-10:30 AM

Computational Design of Fabric Formwork
Xiaoting Zhang
Boston University

Guoxin Fang
TU Delft, The Chinese University of Hong Kong

Melina Skouras
INRIA

Gwenda Gieseler
TU Delft

Charlie Wang
The Chinese University of Hong Kong

Emily Whitnig
Boston University

Volume-Aware Design of Composite Molds
Thomas Alderighi
Università di Pisa; ISTI-CNR, Pisa

Luigi Malomo
ISTI - CNR

Bernd Bickel
IST Austria

Paolo Cignoni
ISTI - CNR

Nico Pietroni
UTS Sydney, ISTI - CNR

Geometry-Aware Scattering Compensation for 3D Printing
Denis Sumin
Max-Planck-Institute for Informatics

Tobias Rittig
Charles University in Prague

Vahid Babaei
Max Planck Institute for Informatics

Thomas Nindel
Alexander Wilkie
Charles University in Prague

Piotr Didyk
Università della Svizzera italiana

Bernd Bickel
IST Austria

Jaroslav Krivanek
Charles University in Prague

Karol Myszkowski
Max Planck Institute for Informatics

Tim Weyrich
University College London

LayerCode: Optical Barcodes for 3D Printed Shapes
Henrique T. Maia
Columbia University

Dingzeyu Li
Adobe Research, Columbia University

Yuan Yang
Changxi Zheng
Columbia University
THURSDAY, 1 AUGUST

25. ANIMATION AND SKINNING

9 AM-10:30 AM

R&E

Direct Delta Mush Skinning and Variants

Binh Huy Le
Electronic Arts

JP Lewis
Google

NeuroSkinning: Automatic Skin Binding for Production Characters with Deep Graph Networks

Lijuan Liu
NetEase Fuxi AI Lab

Youyi Zheng
Zhejiang University

Di Tang
Yi Yuan
Changjie Fan
NetEase Fuxi AI Lab

Kun Zhou
Zhejiang University

Spline Interface for Intuitive Skinning Weight Editing

Seungbgee Bang
Sung-Hee Lee
Korea Advanced Institute of Science and Technology

Spline Interface for Intuitive Skinning Weight Editing

Seungbgee Bang
Sung-Hee Lee
Korea Advanced Institute of Science and Technology

Hand Modeling and Simulation Using Stabilized Magnetic Resonance Imaging

Bohan Wang
George Matcuk
Jemej Barbic
University of Southern California

26. COMPUTATIONAL IMAGING

10:45 AM-12:15 PM

R&E

Coding Scheme Optimization for Fast Fluorescence Lifetime Imaging

Jongho Lee
Jenu Varghese Chacko
Bing Dai
Syed Azer Reza
Abdul Kader Sagar
Kevin W. Elizeri
Andreas Vetten
Mohit Gupta
University of Wisconsin-Madison

NeuroSkinning: Automatic Skin Binding for Production Characters with Deep Graph Networks

Lijuan Liu
NetEase Fuxi AI Lab

Youyi Zheng
Zhejiang University

Di Tang
Yi Yuan
Changjie Fan
NetEase Fuxi AI Lab

Kun Zhou
Zhejiang University

Spline Interface for Intuitive Skinning Weight Editing

Seungbgee Bang
Sung-Hee Lee
Korea Advanced Institute of Science and Technology

Hand Modeling and Simulation Using Stabilized Magnetic Resonance Imaging

Bohan Wang
George Matcuk
Jemej Barbic
University of Southern California

27. MPM AND COLLISION

10:45 AM-12:15 PM

R&E

Silly Rubber: An Implicit Material Point Method for Simulating Non-equilibrated Viscoelastic and Elastoplastic Solids

Yu Fang
Minchen Li
Ming Gao
Chenfanfu Jiang
University of Pennsylvania

CD-MPM: Continuum Damage Material Point Methods for Dynamic Fracture Animation

Joshuah Wolper
Yu Fang
Minchen Li
Jiecong Lu
Ming Gao
Chenfanfu Jiang
University of Pennsylvania

Efficient and Accurate Collision Response for Elastically Deformable Models

Mickeal Verschoor
Universidad Rey Juan Carlos

Andrei Jalba
Eindhoven University of Technology

Compact Snapshot Hyperspectral Imaging with Diffracted Rotation

Daniel S. Jeon
Seung-Hwan Baek
Shinyoung Yi
KAIST

Qiang Fu
Xiong Dun
Wolfgang Heidrich
KAUST

KEYS

REGISTRATION LEVELS

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS

- P&A Production & Animation
- R&E Research & Education
- A&D Arts & Design
- G&I Gaming & Interactive
- NT New Technologies

RETURN TO TABLE OF CONTENTS

#SIGGRAPH2019 | S2019.SIGGRAPH.ORG
THURSDAY, 1 AUGUST

Implicit untangling: A Robust Solution for Modeling Layered Clothing

Thomas Buffet
Inria, Ecole Polytechnique

Damien Rohmer
Ecole Polytechnique

Loïc Barthe
University of Toulouse - IRIT, Institut de Recherche en Informatique de Toulouse (IRIT)

Laurence Boissieux
Inria

Marie-Paule Cani
Ecole Polytechnique

28. SOUND GRAPHICS
10:45 AM-12:15 PM

Learning to Optimize Halide with Tree Search and Random Programs
Andrew Adams
Facebook AI Research

Karima Ma
University of California, Berkeley; Facebook AI Research

Luke Anderson
Riyadh Baghdadi
Tzu-Mao Li
MIT CSAIL

Steven Johnson
Google

Michael Gharbi
Adobe

Benoît Steiner
Facebook AI Research

Kayvon Fatahalian
Stanford University

Fredo Durand
MIT CSAIL

Jonathan Ragan-Kelley
University of California, Berkeley

Variational Implicit Point Set Surfaces
Zhiyang Huang
Washington University in St. Louis

Nathan Carr
Adobe Research

Tao Ju
Washington University in St. Louis

29. MACHINE LEARNING FOR RENDERING
2 PM-3:30 PM

Sample-Based Monte Carlo Denoising using a Kernel-Splatting Network

Jaakko Lehtinen
Aalto University

Fredo Durand
MIT
THURSDAY, 1 AUGUST

Deep Convolutional Reconstruction For Gradient-Domain Rendering
Markus Kettunen
Erik Harlönén
Aalto University
Jaakko Lehtinen
Aalto University, Nvidia

Neural Importance Sampling
Thomas Müller
Disney Research, ETH Zürich
Brian McWilliams
Fabrice Rousselle
Disney Research
Markus Gross
Disney Research, ETH Zürich
Jan Novak
Disney Research

A Learned Shape-Adaptive Subsurface Scattering Model
Delio Vicini
EPFL
Vladlen Koltun
Intel Labs
Wenzel Jakob
EPFL

30. FLUIDS II
2 PM-3:30 PM

Efficient and Conservative Fluids Using Bidirectional Mapping
Ziyin Qu
Xinxin Zhang
AICFVE, Beijing Film Academy
Ming Gao
Chenfanfu Jiang
University of Pennsylvania
Baoquan Chen
Peking University

On Bubble Rings and Ink Chandeliers
Marcel Padilla
Albert Chern
Felix Knöpfl
Ulrich Pinkall
Technical University of Berlin
Peter Schröder
California Institute of Technology

Fundamental Solutions for Water Wave Animation
Camille Schreck
Christian Hafner
Chris Wojtan
Institute of Science and Technology Austria

Editing Fluid Animation using Flow Interpolation
Syuhei Sato
Prometech CG Research
Yoshinori Dobashi
Hokkaido University
Tomoyuki Nishita
Prometech CG Research, Hiroshima
Shudo University

31. DESIGN AND LAYOUT
2 PM-3:30 PM

Synthetic Silviculture: Multi-scale Modeling of Plant Ecosystems
Milošz Makowski
Adam Mickiewicz University in Poznan
Torsten Haedrich
Jan Scheffczyk
Dominik L. Michels
KAUST
Soeren Pirk
Google Brain
Wojtek Palubicki
Adam Mickiewicz University in Poznan

PlanIT: Planning and Instantiating Indoor Scenes with Relation Graph and Spatial Prior Networks
Kai Wang
Yu-An Lin
Ben Weissmann
Brown University
Manolis Savva
Angel Chang
Simon Fraser University
Daniel Ritchie
Brown University
THURSDAY, 1 AUGUST

Content-Aware Generative Modeling of Graphic Design Layouts
Xinru Zheng
Xiaotian Qiao
Ying Cao
Rynson Lau
City University of Hong Kong

EasyFont: A Style Learning-Based System to Easily Build Your Large-Scale Handwriting Fonts
Zhouhui Lian
Bo Zhao
Xudong Chen
Jianguo Xiao
Peking University, Institute of Computer Science and Technology

32. ACQUIRING, PERCEIVING AND RENDERING MATERIAL APPEARANCE
3:45 PM-5:15 PM

Deep Inverse Rendering for High-Resolution SVBRDF Estimation From an Arbitrary Number of Images
Duan Gao
Tsinghua University, Microsoft Research Asia
Xiao Li
University of Science and Technology of China, Microsoft Research Asia
Yue Dong
Microsoft Research Asia
Pieter Peers
College of William & Mary
Kun Xu
Tsinghua University
Xin Tong
Microsoft Research Asia

A Similarity Measure for Material Appearance
Manuel Lagunas
Sandra Malpica
Ana Serrano
Universidad de Zaragoza, I3A
Elena Garces
Universidad Rey Juan Carlos, Madrid
Diego Gutierrez
Belen Masia
Universidad de Zaragoza, I3A

Using Moments to Represent Bounded Signals for Spectral Rendering
Christoph Peters
Karlsruhe Institute of Technology
Sebastian Merzbach
University of Bonn
Johannes Hanika
Karlsruhe Institute of Technology, Weta Digital
Carsten Dachsbacher
Karlsruhe Institute of Technology

Accurate Appearance Preserving Prefiltering for Rendering Displacement-Mapped Surfaces
Lifan Wu
University of California, San Diego
Shuang Zhao
University of California, Irvine
Ling-Qi Yan
University of California, Santa Barbara
Ravi Ramamoorthi
University of California, San Diego

TECHNICAL PAPERS CLOSING SESSION
Thursday, 1 August, 5:15 PM-5:35 PM
Immediately following the last Technical Paper join us for a wrap-up of SIGGRAPH 2019, together with a look forward to next year’s papers program with the SIGGRAPH 2020 Technical Papers Chair, Szymon Rusinkiewicz.
This program, housed within the Immersive Pavilion located in the Experience Hall, boasts an interactive space for attendees to discover the latest advancements in realities — games, research, healthcare, and more. The program is organized into three core physical spaces: the Arcade (games and experiences), the Museum, and the Village (installations). For content descriptions, visit https://s2019.siggraph.org/conference/programs-events/virtual-augmented-and-mixed-reality/

**ARCADE**

**BEACH BODY BROS**

*Tyler Hurd
Gentle Manhands, Oculus*

**DADUM: EXPERIENCING MEMORIES OF MY FATHER**

*Danilo Gasques
University of California San Diego; Arthur C. Clarke Center for Human Imagination*

*Bynhan Pham
University of California San Diego; Virbella*

*Jon Paden
Visual Arts, University of California San Diego*

**GLOOMY EYES**

*Antoine Cayrol
ATLAS V*

*German Heller
3 DAR*

**NUCLEAR DISSENT**

*Pablo Vio
Heather Phenix
Jam3*

**PIXEL RIPPED 1989**

*Ana Ribeiro
Fernanda Martins
Pixel Ripped*

**PROJECT JUA**

*Brian First
Raymond Ononiwu
Ayuba Audu
Dunni Abiodun
Microsoft*

*Max Sacker
Ioulia Isserlis
Another World*

**SPHERES**

*Eliza McNitt
Pale Blue Dot*

*Jess Engel
Crimes of Curiosity*

*Dylan Golden
Protozoa Pictures*

*Arnaud Colinart
Atlus V*

*Darren Aronofsky
Protozoa Pictures*

*Joel Newton
CityLights*

*Ari Handel
Protozoa Pictures*

**HOURS**

*Sunday, 28 July, 1:30 PM-5:30 PM
Monday, 29 July, 10 AM-5:30 PM
Tuesday, 30 July, 10 AM-5:30 PM
Wednesday, 31 July, 10 AM-5:30 PM
Thursday, 1 August, 10 AM-3:30 PM*
T.REX: SKELETON CREW
 Nicholas Bartzokas
 Laura Moustakerski
 Eozin Che
 American Museum of Natural History

 Chris Chin
 Jad Boniface
 Dario Laverde
 HTC VIVE

 Piotr Baczyński
 Bartosz Roslonski
 Immersion VR

 Corrie Roe
 American Museum of Natural History

 Joanna Liu
 New York University

 IL DIVINE: MICHELANGELO’S SISTINE CEILING IN VR
 Christopher Evans
 Epic Games

 MEU
 Sarah Hashkes
 Radix Motion

 MICA
 John Monos
 Alice Wroe
 Magic Leap

 REINCARNATION - VIRTUAL REALITY RECREATION OF YVES TANGUY’S WORLD
 Jing Yan
 D2 Nova; Media Arts and Technology

 Mengyu Chen
 Media Arts and Technology

 AIR: AUGMENTED INTERSECTION OF REALITIES
 Christian Vazquez
 Benjamin Reynolds
 Anna Fuste
 Hisham Bedri
 Valentin Heun
 PTC Reality Lab

 ANIMUS XR
 Marc Petz
 Mary Musto
 Laura Robinson
 Keith Takes
 Kent Career Tech Center

 BEING HENRY
 Sarah Berkovich
 Self/Oculus Launch Pad

 DEEP REALITY: AN UNDERWATER VR EXPERIENCE TO PROMOTE RELAXATION BY UNCONSCIOUS HR, EDA AND BRAIN ACTIVITY BIOFEEDBACK
 Judith Amores Fernandez; Anna Fuste Lleixa;
 MIT Media Lab

 Robert Richer
 FAU

 Pattie Maes
 MIT Media Lab

 DRAWING SOUND IN MR SPACE
 Ryu Nakagawa
 Ryo Komatsubara
 Taku Ota
 Ken Sonobe
 Nagoya City University

 Takahisa Mitsumori
 Moph Records

 Katsutoshi Hata
 Nangok R/Studios Co.,Ltd

 Hidefumi Ohmura
 Tokyo University of Science

 KEYS

 REGISTRATION LEVELS
 Full Conference Platinum (FP)
 Full Conference One-Day (FOD)
 Full Conference (F)
 Select Conference (S)
 Experiences (XP)
 Exhibitors (EX)
 Business Symposium (B)

 INTEREST AREAS
 Production & Animation  Research & Education  Arts & Design  Gaming & Interactive  New Technologies  Adaptive Tech
VIRTUAL, AUGMENTED AND MIXED REALITY, CONTINUED

ECLIPSE
MT
Jonathan Astruc
Aymeric Favre
Frederic Cussey
Frederic Lecompte
Jonathan Tamene
Frederic Plantard
Flavien Galliot
Paul Etienne Duclos
Darrin Taylor
BlackLight

OVS+TUMOR: A TOOL FOR ENHANCED LUNG TUMOR ANNOTATION IN VR FOR MACHINE LEARNING TRAINING AND ANALYSIS
MT
Santiago Lombeyda
Ashish Mahabal
California Institute of Technology

Daniel Crichton
Heather Kincaid
JPL

George Djorgovski
California Institute of Technology

Christos Patriotis
Sudhir Srivastava
National Cancer Institute

WOLVES IN THE WALLS: CHAPTER 2, IT'S ALL OVER
MT
Peter Billington
Fable

NEURAL AR: IMMERSIVE Augmented REALITY WITH REAL-TIME NEURAL STYLE TRANSFER
MT
Daiki Taniguchi
Akatsuki Inc.

WORLDSPACE PAINTING DATA VISUALIZATION
MT
Kyungjin Yoo
Dean Foster
UMD

NITRO
MT
Greg J. Tamargo
Marc Huet
JJ Castillo
Viewer Ready

REMOTE SPATIAL PROGRAMMING AND COLLABORATION USING A REAL-TIME VOLUMETRIC CAPTURE SPACE
MT
Hisham Bedri
Ben Reynolds
Valentin Heun
Christian Vazquez
Anna Fuste
PYC

Hisham Bedri
Ben Reynolds
Valentin Heun
Christian Vazquez
Anna Fuste
PYC

THE LAST OASIS
MT
Goro Fujita
Quill

OILLIE
MT
Sagar Ramesh
Drew Okenfuss
Zachary Flores
Annie Oh
University of Southern California

VR MINECRAFT FOR ART
MT
Kyungjin Yoo
Ryan Havel
Nikhil Patel
UMD

KEYS

REGISTRATION LEVELS
- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS
- P&A Production & Animation
- R&E Research & Education
- A&D Arts & Design
- G&I Gaming & Interactive
- NT New Technologies
The VR Theater is a marquee destination that showcases state-of-the-art virtual reality storytelling. It is a juried program that is presented in a beautiful, panoramic theater and in colocated kiosks. For content descriptions and detailed ticketing information, visit [https://s2019.siggraph.org/conference/programs-events/computer-animation-festival/vr-theater/](https://s2019.siggraph.org/conference/programs-events/computer-animation-festival/vr-theater/)

**SCREENINGS**

- **A Kite’s Tale**
  - Bruce Wright
  - Walt Disney Animation Studios (United States)

- **Ghost Fleet VR**
  - Lucas Gath
  - Catovia LLC (United States)

- **The Great C**
  - Steve Miller
  - Secret Location (Canada)

- **Inside Hurricane Maria in 360 degrees**
  - Gregory Shirah
  - NASA/GSFC - Scientific Visualization Studio (United States)

- **Jurassic World: Blue**
  - Felix Lajeunesse, Paul Raphael
  - Felix & Paul Studios (Canada)

- **MindPalace**
  - Carl Krause
  - Filmakademie Baden-Württemberg (Germany)

- **Traveling While Black**
  - Roger Ross Williams
  - Felix & Paul Studios (Canada)

- **1inch VR**
  - Seok Nam Koong
  - M2S (South Korea)

- **Age of Sail**
  - John Kahrs
  - Boatthouse Studios, Google Spotlight Stories (United States)

- **The bOnd**
  - Olly Reid
  - Axis Studios (United Kingdom)

- **Children Do Not Play War**
  - Fabiano Mixo
  - VILD Studio (Brazil)

**KIOSKS**

- **2nd Step**
  - Joerg Courtial
  - Faber Courtial (Germany)

- **Bonfire**
  - Larry Cutler
  - Baobab Studios (United States)

- **Doctor Who: The Runaway**
  - Mathias Chelebourg
  - BBC VR Hub, BBC Doctor Who, Passion Animation Studios (United Kingdom)

- **Kaiju Confidential**
  - Ethan Shaftel
  - easyAction, ShadowMachine (United States)

**INTEREST AREAS**

- **P&A** Production & Animation
- **R&E** Research & Education
- **A&D** Arts & Design
- **G&I** Gaming & Interactive
- **NT** New Technologies
ACM SIGGRAPH is an international community of researchers, artists, practitioners, and business professionals who share an interest in computer graphics and interactive techniques. At SIGGRAPH 2019, ACM SIGGRAPH offers a diverse menu of programs and services for its members and the computer graphics community. For full event descriptions, visit https://s2019.siggraph.org/conference/programs-events/organization-events/

DIVERSITY & INCLUSION SUMMIT
Sunday, 28 July, 8:40 AM-5:30 PM
The ACM SIGGRAPH Diversity and Inclusion Summit is a full-day workshop with a roster of informative and impactful speakers from a range of backgrounds and disciplines that demonstrate how our diversity makes us stronger. We invite you to join us for captivating discussions as we examine the pressing issues and relevant topics facing the computer graphics and interactive techniques community. Sessions include:

The Case for Diversity and the Lens of Intersectionality
Rendering Gender: Identity, Representation, and Sexuality in 3D Design, Interactive Media, and Animation
HERstories: Women Leaders in the Digital World
Inclusion of Diverse Talent With Outstanding Abilities
Diversity, Collaboration, and Building Toward an Inclusive Organization
Is AI Biased & Can AI Be Ethical?

DOCTORAL CONSORTIUM
Saturday, 27 July, 9 AM-6 PM
Ph.D. students meet and discuss work with one another and a panel of experienced SIGGRAPH researchers.

FRONTIERS TALKS AND WORKSHOPS
Saturday, 27 July, 9 AM-6 PM
The ACM SIGGRAPH Frontiers program (talks and workshops) showcases perspectives on emerging and adjacent areas of interest to the SIGGRAPH community.

 Talks
Sunday, 28 July-Thursday, 1 August, 8 AM-8:45 AM
The ACM SIGGRAPH Frontiers Talks will engage our audiences with the groundbreaking work being done alongside our industry with the tools and foundations developed within our own community. From Next Generation Display Devices, to Visualization and Simulation to communicate highly complex data artistically, tools developed to assist professionals are now impacting individuals, and the conversation is just getting started! Schedule is incomplete and subject to change.

For an updated list of Frontiers Talks, visit: https://s2019.siggraph.org/conference/programs-events/acm-siggraph-frontiers/

How Computer Graphics Expertise Will Further the State of the Art in Machine Learning
Martin Wicke
Google
Imaging a Black Hole with the Event Horizon Telescope
Katherine Bouman
California Institute of Technology
ACM SIGGRAPH ORGANIZATION EVENTS, CONTINUED

### Workshops

**Sunday, 28 July, 9 AM-5 PM**

**Computer Graphics for Autonomous Vehicles**

**Organizers**

Jose A. Iglesias-Gaitán
Computer Vision Center, Universitat Autònoma de Barcelona

German Ros
Intel Labs

Vangelis Kokkevis
Toyota Research Institute

Jose M. Alvarez
NVIDIA Corporation

Yongjoon Lee
Zoox

Philipp Slusallek
Saarland University

**Content Generation for Workforce Training**

**Organizer**
Holly Rushmeier
Yale University

**Textiles: Virtual to Actual**

**Organizer**
James McCann
Carnegie Mellon University

**Sim-to-Real: From Skilled Virtual Agents to Real-World Robots**

**Organizer**
Stelian Coros
ETH Zurich

**Immersive Visualization**

**Organizer**
Tomasz Bednarz
CSIRO Data61, UNSW Art & Design

---

**Cybersickness: Causes and Solutions**

**Organizer**
Bas Rokers
New York University

Kay Stanney
Design Interactive

---

**STUDENT RESEARCH COMPETITION**

**Wednesday, 31 July, 3:45-5:15 PM**

Sponsored by Microsoft the Student Research Competition at SIGGRAPH 2019 offers a unique forum for undergraduate and graduate students to present their original research at well-known ACM sponsored and co-sponsored conferences before a panel of judges and attendees.

---

**THESIS FAST FORWARD**

**Tuesday, 30 July, 2-3:30 PM**

Up to 12 candidates share three-minute oral presentations of innovative ideas live at a special session at SIGGRAPH 2019.

---

**ACM SIGGRAPH TOWN HALLS**

For descriptions and room information, visit: [https://s2019.siggraph.org/conference/programs-events/acm-siggraph-town-halls/](https://s2019.siggraph.org/conference/programs-events/acm-siggraph-town-halls/)

**The Future: Shaping Our Field**

**Monday, 29 July, 10:45 AM-12:15 PM**

**What Can ACM SIGGRAPH Do for You?**

**Tuesday, 30 July, 10:45 AM-12:15 PM**

**Meet the Candidates**

**Tuesday, 30 July, 5:15-6 PM**

**ACM SIGGRAPH Frontiers**

**Wednesday, 31 July, 10:45 AM-12:15 PM**

---

**CO-LOCATED EVENTS**

SIGGRAPH works with other aligned organizations to present additional opportunities for attendees to learn and network during the SIGGRAPH conference week.


26-28 July

Los Angeles, California


**DigiPro2019 (Digital Production Symposium 2019)**

27 July

Millenium Biltmore Hotel
Los Angeles, California

ACM SIGGRAPH THEATER EVENTS

Informative international sessions on the current state of computer graphics around the world, organized by representatives of ACM SIGGRAPH and affiliated societies. For event descriptions, visit https://s2019.siggraph.org/conference/programs-events/organization-events/acm-siggraph-theater-events/

SUNDAY, 28 JULY

BIRDS OF A FEATHER: THE INTERNATIONAL COLLEGIATE VIRTUAL REALITY CONTEST (IVRC)
10 AM-11 AM
P&A

CG IN ASIA
11:30 AM-12:30 PM
P&A

SIGGRAPH FOR BEGINNERS - GENERAL VIEW
12:30 PM-1:30 PM
R&E

SIGGRAPH IN JAPANESE + JAPAN CG SHOWCASE
1:30 PM-3 PM
A&D

DAC: OPEN FORUM OF THE ACM SIGGRAPH DIGITAL ARTS COMMUNITY
3 PM-4:30 PM
A&D

MONDAY, 29 JULY

BIRDS OF A FEATHER: DEMOSCENE WORLDWIDE
4:30 PM-5:30 PM
P&A

BIRDS OF A FEATHER: THE IMMERSIVE VISUALISATION FOR SCIENCE, RESEARCH AND ART
9 AM-11 AM
A&D

CG IN AUSTRALASIA
11 AM-12 PM
R&E

BIRDS OF A FEATHER: ACM SIGGRAPH CARTOGRAPHIC VISUALIZATION
12 PM-1:30 PM
R&E

BIRDS OF A FEATHER: SHENZHEN & LOS ANGELES CHAPTERS MEETUP
3:30 PM-4:30 PM
R&E

TUESDAY, 30 JULY

BIRDS OF A FEATHER: ACROSS THE METAVERSE
9:30 AM-10:30 AM
R&E

BIRDS OF A FEATHER: MASSIVE COLLABORATIVE PROJECT
10:30 AM-12:00 PM
R&E

CG IN EUROPE
12 PM-1 PM
G&I

CG IN AFRICA + MIDDLE EAST
1 PM-2 PM
R&E

KEYS

REGISTRATION LEVELS

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

INTEREST AREAS

P&A Production & Animation
R&E Research & Education
A&D Arts & Design
G&I Gaming & Interactive
NT New Technologies
TABLE OF CONTENTS

**REGISTRATION LEVELS**
- Business Symposium (B)
- Exhibitors (EX)
- Exhibits (E)
- Experiences (XP)
- Select Conference (S)
- Full Conference (F)
- Full Conference One-Day (FOD)
- Full Conference Platinum (FP)
- New Technologies

**INTEREST AREAS**
- Production & Animation (P&A)
- Research & Education (R&E)
- Arts & Design (A&D)
- Gaming & Interactive (G&I)
- New Technologies (NT)

---

**TUESDAY, 30 JULY**

**ACM: THESIS FAST FORWARD**
2 PM-3:30 PM

**CG IN LATIN AMERICA**
3:30 PM-4:30 PM

**ACM SIGGRAPH TOWN HALL: MEET THE CANDIDATES**
5 PM-6 PM

**WEDNESDAY, 31 JULY**

**ACM SIGGRAPH CHAPTERS FAST FORWARD AND STARTUP MEETING**
9 AM-11 AM

**WOMEN IN CG**
11:00 AM-12:00 PM

**THURSDAY, 1 AUGUST**

**DAC: ACM SIGGRAPH DIGITAL ART COMMUNITY ONLINE EXHIBITIONS: OVERVIEW AND OPPORTUNITIES**
9 AM-10 AM

---

**KEYS**

- Full Conference Platinum (FP)
- Full Conference One-Day (FOD)
- Full Conference (F)
- Select Conference (S)
- Experiences (XP)
- Exhibits (E)
- Exhibitors (EX)
- Business Symposium (B)

---

**RETURN TO TABLE OF CONTENTS**

---

**#SIGGRAPH2019 | S2019.SIGGRAPH.ORG**
At the SIGGRAPH Exhibition, you’re invited to check out the newest hardware systems, software tools, and creative services from hundreds of companies. Slip on the latest VR/AR/MR goggles, get your hands on the stylus of the latest animation tool, and much more.

**EXHIBITION HOURS**

Tuesday, 30 July, 9:30 AM-6:00 PM  
Wednesday, 31 July, 9:30 AM-6:00 PM  
Thursday, 1 August, 9:30 AM-3:30 PM

---

**EXHIBITOR LIST (AS OF 6 JUNE)**

- 3DMapMaker  
- 3dMD  
- 4DAGE Technology Co., Ltd.  
- 4Dviews  
- Academy of Art University  
- Advanced Micro Devices (AMD)  
- Aleph Objects, Inc.  
- Allied Powers LLC  
- Alt, Inc.  
- Animation Magazine  
- The Animation Workshop TAW, Via University College  
- Arskan  
- ASUS Global Pte. Limited  
- Autodesk  
- AWS  
- Beijing Noitom technology LTD  
- Blackmagic Design  
- Blender Foundation  
- Boris FX  
- BOXX  
- C2Monster  
- Cap Digital - France  
- Carbon, Inc.  
- Carl Zeiss AG  
- Carnegie Mellon ETC  
- CGAL - The Computational Geometry Algorithms Library  
- CGTrader  
- Clara Technologies  
- CLO Virtual Fashion Inc.  
- Computer Graphics World  
- Conductor Technologies  
- Consulate General of the Czech Republic in Los Angeles & CzechInvest San Francisco  
- Datatang Technology INC.  
- Dell Inc.  
- Dextra Robotics  
- DGG  
- Digi Space Co., LTD  
- Dimensional Imaging (DI4D)  
- Drexel University  
- Dwarf Animation Studio  
- Dynamixz  
- Eclipse Tech, LLC  
- Eizo Inc.  
- Emile Cohl Art Academy  
- Environmental Systems Research Institute  
- Epic Games - Unreal Engine  
- Exceptional Minds  
- Exothermic Systems LLC  
- FaceUnity Technology  
- Faceware Tech  
- FARO Technologies Inc  
- FLIR Systems, Inc. (formerly Point Grey)  
- Flux Planet  
- Formlabs Inc.  
- FORUM8 Co., Ltd.  
- Foundry  
- Fox Renderfarm  
- Fraunhofer IIS  
- ftrack  
- Glassbox  
- Golaem  
- Gold Array Technology Beijing LLC  
- Google  
- hypsense  
- IATSE  
- ICVR  
- IncrediBuild  
- Ino-VR  
- InstaLOD  
- Intel Corporation  
- International Computer Concepts (ICC)  
- Inventive Software LLC  
- InviziTrak  
- IO Industries  
- IOGEAR  
- KeenTools  
- KyungHee University  
- Lemnis Technologies  
- Luxion, Inc.  
- MatterHackers, Inc.  
- MAXON  
- Mercenaries Engineering  
- Microsoft Corporation  
- Mocap Now  
- Motion Analysis Corporation  
- MSI Computer Corp.  
- Mura Vision  
- NorPix Inc.  
- NVIDIA Corporation  
- Observer Analytics  
- Oculus Medium  
- One Stop Systems  
- OptiTrack  
- OTOY, Inc.  
- Ouster  
- Paris Region  
- Part Time Evil  
- Persistant Studios  
- Pixel Plow  
- PNY Technologies  
- Pogo Linux  
- PolyPort Inc.  
- QNAP, Inc.  
- The Qt Company  
- Qualisys  
- Quantum Corporation  
- Qumulo  
- Raise3D Technologies  
- Ranch Computing  
- RAVE Computer  
- Reallusion Inc.  
- Redshift Rendering Technologies, Inc  
- Ringling College of Art and Design  
- Rizom-Lab  
- Rokoko  
- ROOT Data Center  
- Russian3Dscanner  
- Safe Software  
- SCAD  
- The Scan Truck  
- SF FILM SCHOOL  
- Sharecg.com  
- SideFX Software  
- Sketchfab Inc.  
- Speednet Sphere  
- SpeedTree  
- The Studio - B&H  
- Substance by Adobe  
- SymTouch Inc.  
- T.OZ  
- Taiwan Pavilion  
- TechViz  
- Terathon Software  
- Tobii Pro  
- Toolchefs Ltd  
- TV Paint  
- Unity Technologies  
- The University of the Arts  
- UST Global Media Services  
- V.DO Inc  
- VectorZero, Inc.  
- Vicon  
- ViewSonic  
- VIRTUALITICS  
- Visual Computing Center at KAUST  
- Volograms  
- VR Cambrian  
- VRSQUARE  
- Wacom Technology  
- Web3D Consortium  
- Wmch inc.  
- Wysilab  
- Xsens Technologies B.V.  
- Yadle  
- z-emotion
Comprehensive summaries of the latest technologies in computer graphics and interactive techniques. SIGGRAPH 2019 exhibitors demonstrate software, hardware, and systems; answer questions; and host one-on-one conversations about how their applications improve professional and technical performance.

For an updated list and to learn more about exhibitor sessions, please visit [https://s2019.siggraph.org/exhibition/exhibitor-sessions/](https://s2019.siggraph.org/exhibition/exhibitor-sessions/)

**AUTOESK VISION SERIES**

Room 404A

30 July

10:15 AM-11 AM: Bifrost – It’s here!
11:30 AM-12:15 PM: What’s new with Arnold GPU
12:45 PM-1:30 PM: Human + AI = Future of Creation and Entertainment
2 PM-2:45 PM: Open Source support at Autodesk – USD focus
3:15 PM-4 PM: Maya: Faster Animation, Artist Workflows, and the Future
4:30 PM-5:15 PM: Thriving with Shotgun: Setting Creative Teams Up for Success

31 July

9:30 AM-10 AM: Autodesk Forge - Automate unique, web-based 3D data experiences
10:15 AM-11 AM: Bifrost – It’s here!
11:30 AM-12:15 PM: 3ds Max: producing high-end results at scale without sacrificing quality
12:45 PM-1:30 PM: Unity and Autodesk: Streamlining Workflows for Film/Animation/TV
2 PM-2:45 PM: Interactive and flexible rendering workflows with Arnold Operators
3:15 PM-4 PM: Open Source support at Autodesk – MaterialX focus
4:30 PM-5:15 PM: Autodesk Flame – AI revolutionizes common tasks for VFX Compositing and Color Finishing

**BLUE SKY STUDIOS: RESUME DROP OFF AND OPEN HOUSE AT SIGGRAPH**

Room 301A
31 July, 10 AM-4 PM

**CARBON: COMPUTATIONAL GEOMETRY AND SOFTWARE**

Room 511B/C
31 July, 10:30 AM-11:30 AM

**CGTRADER: LEVERAGING STACK 3D CONTENT TO ACCELERATE TIME TO MARKET AND REDUCE COSTS**

Room 511B/C
30 July, 10:30 AM-11:30 AM

**CHAOS GROUP**

Room 409A
30 July

10 AM-11 AM: Total Chaos @ SIGGRAPH session 1
11 AM-12 PM: Total Chaos @ SIGGRAPH session 2
2 PM-3 PM: Total Chaos @ SIGGRAPH session 3
3 PM-4 PM: Total Chaos @ SIGGRAPH session 4
4 PM-5 PM: Total Chaos @ SIGGRAPH session 5

31 July

10 AM-11 AM: Total Chaos @ SIGGRAPH session 6
11 AM-12 PM: Total Chaos @ SIGGRAPH session 7
2 PM-3 PM: Total Chaos @ SIGGRAPH session 8
3 PM-4 PM: Total Chaos @ SIGGRAPH session 9
4 PM-5 PM: Total Chaos @ SIGGRAPH session 10

**DEXTA ROBOTICS: WHAT MAKES FORCE FEEDBACK GLOVES THE MOST INTUITIVE INTERACTION METHOD**

Room 511B/C
31 July, 3:30 PM-4:30 PM

**FOUNDRY**

Room 502B
29 July

12 PM-1:30 PM: Education Summit
4 PM-6 PM: Look Development and Lighting Meetup

30 July

10 AM-11:30 AM: Plotting Your VFX Studio’s Journey Into The Cloud
12 PM-1:30 PM: Solving Creative Challenges with Nuke Family - The Artists’ Story
2 PM-3:30 PM: Solving Creative Challenges Through Development in Nuke
4 PM-6 PM: Solving Creative Challenges with Modo

**INTEL**

Room 406B
29 July

11 AM-12 PM: Intel Open Image Denoise : Optimized CPU Denoising
12:30 PM-1:30 PM: Using Variable Rate Shading to improve the user experience in real-time game engines
3:30 PM-4:30 PM: Ray Tracing with Intel Embree and Intel OSPRay : Use Cases and Updates
INTEL
Room 406B
30 July
9 AM-10 AM: Bringing the future of entertainment to your living room: MPEG-I Immersive Video
11 AM-12 PM: From RenderMan 22.0® to Next Gen RenderMan XPU and Beyond: Role of Open Shading Language (OSL) with Intel® AVX512.
1 PM-2 PM: Bringing Intelligent Motion using Reinforcement Learning to Intel® Client Platform
2:30 PM-3:30 PM: Build a Deep Learning Video Analytics Framework for Intel AI Platforms

31 July
9 AM-10 AM: Advanced SIMD programming with Intel ISPC
11 AM-12 PM: Enhancing and Accelerating your AI and Machine Learning solution through Intel Integrated Graphics
1 PM-2 PM: Using Variable Rate Shading to improve the user experience in real-time game engines
2:30 PM-3:30 PM: AnyFace: A solution for creating film industry quality facial rendering and animation using mainstream PCs.
4:30 PM-5:30 PM: Creators Meet Technology

1 August
9 AM-10 AM: Advanced SIMD programming with Intel ISPC

NVIDIA
Room 501A/B
28 July
2 PM-5:15 PM: Deep Learning for Content Creation and Real-Time Rendering

29 July
9 AM-12:15 PM: Special Topics and Latest Advances in Graphics for Film and Design
2:5 PM: GPU Ray Tracing for Film and Design

30 July
9 AM-12:15 PM: Real-Time Rendering – Technical Update

31 July
9 AM-10:30 AM: Latest Advances in Real-Time Ray Tracing
10:30 AM-12 PM: Advanced Real-Time Ray Tracing Tutorial
2 PM-5:15 PM: Ray Tracing Gems 1.1

PIXAR ANIMATION STUDIOS: RECRUITING
Room: 515A
29 July – 1 August
All day events

QUMULO
Room 511B/C
31 July, 2 PM-3 PM

SHOTGUN DEV DAY
Room 409A
29 July
9 AM-10:30 AM: Intro to Developing for Shotgun
11 AM-12:30 PM: Advanced Shotgun Development
2 PM-3 PM: Shotgun Developer Group

SUBSTANCE BY ADOBE: SUBSTANCE DAY AT SIGGRAPH
Room 409B
29 July, 10 AM-6 PM

TOBII AB: BETTER XR DEVICES WITH EYE TRACKING
Room 511B/C
30 July, 2 PM-3 PM

WALT DISNEY ANIMATION STUDIOS
Room 410
29 July
2 PM-5 PM: Women In Animation Summit

30 July
11 AM-5 PM: The Walt Disney Company Suite - Open Hours

31 July
9 AM-11 AM: Walt Disney Animation Studios Educator's Forum
1 PM-5 PM: The Walt Disney Company Suite - Open Hours
The Job Fair is the best place at SIGGRAPH 2019 for employers to meet with thousands of job seekers from around the globe!

Once again, Job Fair Exhibitors will be posting their jobs on the CreativeHeads.net and ACM SIGGRAPH job boards one month prior to the conference. This allows SIGGRAPH 2019 attendees to connect with employers before the conference, during the conference via the Job Fair, and after the conference via the CreativeHeads.net job board and candidate profiling system.

CreativeHeads.net provides the most comprehensive recruitment software solution for the VFX, animation, video game, TV, film, and 3D technology and software tools industries.

**Employers**

The Job Fair is **the best place to be** if you want to...

- Meet with seasoned professionals working in the creative industries.
- Find right-brain, left-brain, and hybrid talent!
- Promote your company, job openings, projects, and participation to millions of people via SIGGRAPH 2019 and the CreativeHeads.net Job Board.
- Reach an extremely diverse and experienced group of creative professionals working across multiple creative industries.

**Job Seekers & Casula Networkers**

The Job Fair is **the best place to be** if you are:

- Actively looking for a new job.
- Passively networking to see what opportunities are available.
- Interested in getting acquainted with some great companies.
- Hoping to broaden your horizons and possibly switch industries.
- Looking for career development tips.
- Wanting to learn about the latest CG and interactive techniques.

---

**JOB FAIR HOURS**

Tuesday, 30 July, 9:30 AM-6:00 PM
Wednesday, 31 July, 9:30 AM-6:00 PM

**JOB FAIR PARTICIPANTS**

(AS OF 7 JUNE)

Activision
Animal Logic
Bungie
The Focus
FoxNext Games
Garmin International
Hi- Rez Studios
Ilion Animation Studios
Mikros Animation
The Mill
MPC Film
Mr. X
Oxide Games
Reel FX Animation Studios
Rodeo FX
Savannah College of Art and Design
Ubisoft Group
WB Games
Weta Digital
Zero VFX
Zoic Studios
ATTENDEE LOUNGE

Hang out, relax, and recharge (yourself and your devices). All registration levels welcome.

Hours
Sunday, 28 July, 8:30 AM-8 PM
Monday, 29 July, 8:30 AM-6 PM
Tuesday, 30 July, 8:30 AM-7:45 PM
Wednesday, 31 July, 8:30 AM-8 PM
Thursday, 1 August, 8:30 AM-5:35 PM

BOOKSTORE

BreakPoint Books offers books, CDs, and DVDs on computer animation, graphic design, gaming, 3D graphics, modeling, and digital artistry. The bookstore features recent books by SIGGRAPH 2019 speakers and award winners.

To suggest books, CDs, or DVDs that should be available in the bookstore, please contact Breakpoint Books at dhemsath83@gmail.com.

CHILD CARE

SIGGRAPH 2019 will offer high quality children’s programming and services, provided by KiddieCorp. Inc., for children aged 6 months through 12 years old. There will be appropriate activities for each age group. A $5 non-refundable deposit is required at the time of the reservation.

The registration deadline is 26 July, 2019 at 12 PM Pacific Time. For hours of operation and to register, visit https://s2019.siggraph.org/attend/child-care/

CHILD POLICY

Registration Requirements
All children must register for the conference, regardless of age. Each paid adult may register up to three children, 12 and under at no charge. Children 13 and over will be required to purchase their registration.

Disclaimer
Please be aware that parts of the Conference may contain adult content, graphic images, or violence.

Attendance Restrictions
There are no age-based restrictions to attend at Conference. However, children 17 and under must be accompanied by a registered adult at all times.

Lost Children
Unattended and lost children are to be taken to the Conference Management Office (Room 304A) until parents/guardians can be located. Conference Management staff will notify SIGGRAPH security and instruct them to advise their staff with respect to the discovered child, as parents will probably approach Security personnel with inquiries.

GEEK BAR

Network in real-time, stream conference session content, or enjoy wireless access and comfy chairs. Only open for Full Conference Platinum and Full Conference attendees.

Hours
Sunday, 28 July, 8:30 AM-8 PM
Monday, 29 July, 8:30 AM-5:35 PM
Tuesday, 30 July, 8:30 AM-7:45 PM
Wednesday, 31 July, 8:30 AM-8 PM
Thursday, 1 August, 8:30 AM-5:35 PM

HOTEL RESERVATIONS

Visit the SIGGRAPH 2019 hotel page to access the easy-to-use online hotel reservation system, or contact SIGGRAPH 2019’s Official Housing Partner:

onPeak
+1.855.416.6073 (Toll Free and Domestic)
+1.312.527.7300 (International)
siggraph@onPeak.com

onPeak is the only official hotel provider for SIGGRAPH 2019. Room rates or availability by any other company or representative cannot be guaranteed by SIGGRAPH 2019. While other hotel resellers may contact you offering hotel options, they are not endorsed by or affiliated with SIGGRAPH 2019, and entering into financial agreements with such companies may have costly consequences (such as, loss of deposit or payments, unintended cancellation of reservations or no reservations).

LOS ANGELES CONVENTION CENTER

1201 South Figueroa Street
Los Angeles, California 90015

Accessibility
The convention center is handicap accessible. If you have special needs or requirements, please contact Conference Management at: confadmin@siggraph.org

Food Services
A variety of food truck vendors and concessions are available throughout the convention center and outdoor plaza space.

Internet Access
Free wireless access is available during SIGGRAPH 2019 in all conference locations within the Los Angeles Convention Center (except in the Exhibit Hall).

Disclaimer
Please be aware that parts of the Conference may contain adult content, graphic images, or violence.

Attendance Restrictions
There are no age-based restrictions to attend at Conference. However, children 17 and under must be accompanied by a registered adult at all times.

Lost Children
Unattended and lost children are to be taken to the Conference Management Office (Room 304A) until parents/guardians can be located. Conference Management staff will notify SIGGRAPH security and instruct them to advise their staff with respect to the discovered child, as parents will probably approach Security personnel with inquiries.

GEEK BAR

Network in real-time, stream conference session content, or enjoy wireless access and comfy chairs. Only open for Full Conference Platinum and Full Conference attendees.

Hours
Sunday, 28 July, 8:30 AM-8 PM
Monday, 29 July, 8:30 AM-5:35 PM
Tuesday, 30 July, 8:30 AM-7:45 PM
Wednesday, 31 July, 8:30 AM-8 PM
Thursday, 1 August, 8:30 AM-5:35 PM

HOTEL RESERVATIONS

Visit the SIGGRAPH 2019 hotel page to access the easy-to-use online hotel reservation system, or contact SIGGRAPH 2019’s Official Housing Partner:

onPeak
+1.855.416.6073 (Toll Free and Domestic)
+1.312.527.7300 (International)
siggraph@onPeak.com

onPeak is the only official hotel provider for SIGGRAPH 2019. Room rates or availability by any other company or representative cannot be guaranteed by SIGGRAPH 2019. While other hotel resellers may contact you offering hotel options, they are not endorsed by or affiliated with SIGGRAPH 2019, and entering into financial agreements with such companies may have costly consequences (such as, loss of deposit or payments, unintended cancellation of reservations or no reservations).

LOS ANGELES CONVENTION CENTER

1201 South Figueroa Street
Los Angeles, California 90015

Accessibility
The convention center is handicap accessible. If you have special needs or requirements, please contact Conference Management at: confadmin@siggraph.org

Food Services
A variety of food truck vendors and concessions are available throughout the convention center and outdoor plaza space.

Internet Access
Free wireless access is available during SIGGRAPH 2019 in all conference locations within the Los Angeles Convention Center (except in the Exhibit Hall).
GENERAL INFORMATION, CONTINUED

Luggage and Coat Check
Luggage and Coat check services are available in the Image Quest Plus Business Center at the Los Angeles Convention Center throughout the conference week. There is a $5 fee for each item up to four hours and a $10 fee for each item dropped off for more than four hours. Late fees for items not picked up at the conclusion of the day will apply.

Nursing Mothers Room
The First Aid Station in South Hall Lobby has a private room reserved for breastfeeding mothers. There is also a nursing room in the First Aid Station in West Hall also. Both are available during the conference days.

PARKING
Use these links below to locate parking near or at the Los Angeles Convention Center:

Downtown Parking
LA LIVE Parking
Los Angeles Convention Center Parking

PHOTOGRAPHY AND RECORDING POLICIES
All registered media and attendees are encouraged to take photos and record video in approved areas at SIGGRAPH 2019. However, it is important to recognize that many of the words, images, sounds, objects, and technologies presented at SIGGRAPH are protected by copyrights or patents. Please respect their intellectual-property rights and do not photograph or shoot video in designated “No Photography” areas.

Photography and recording is prohibited in the Electronic Theater, Production Sessions and the VR Theater, and is at the discretion of presenters for the following programs: ACM SIGGRAPH Award Talks, Art Papers, Courses, Exhibition, Exhibitor Sessions, Panels, Talks and Technical Papers.

Cameras and Recording Devices
All attendee cameras and recording equipment must be hand-held. Members of the media are allowed to use tripods and larger equipment, but they must register their devices with the SIGGRAPH 2019 Media Office in advance of use.

Conference Photographers & Videographers
SIGGRAPH 2019 employs professional photographers and videographers and reserves the right to use all images and videos that these content creators document during the conference for publication and promotion of ACM SIGGRAPH events.

POWER STATIONS
There are three charging stations at SIGGRAPH 2019, one in the Concourse Hallway (between South Lobby and in front of the Business Center), one in the Compass Terrace (in front of the Compass Café) and one in the Petree Hall Corridor (in front of Hall A across from the Galaxy Café).

SPECIAL POLICIES
Computer Animation Festival Electronic Theater Access
To be admitted to the Computer Animation Festival Electronic Theater, you must have a ticket. A ticket is included with Full Conference Platinum and Full Conference registrations. Other levels will need to purchase a ticket separately. Please note: There will be only one show this year, Monday, 29 July, 6:30 PM-8:35 PM

Reception Access
To be admitted into the Reception, you must have a ticket. Your badge does not provide access.

Technical Materials and Merchandise
All SIGGRAPH 2019 technical materials and merchandise must be picked up at the conference at Merchandise Pickup. No refunds will be given for items that are not claimed at the conference, nor will unclaimed items be shipped after the conference.

REGISTRATION FEES AND CATEGORIES INFORMATION
For detailed information on the registration fees and registration categories that best fits your schedule and budget visit:

https://s2019.siggraph.org/attend/register/

One-Day Registration
Full Conference One-Day registration is available. It includes one-day admission to conference programs, events, and experiences as well as the Exhibition (Tuesday-Thursday). It does not include access to the Business Symposium, Electronic Theater or a Reception ticket.

Refund and Cancellation Deadlines
Cancellation requests for refunds must be made in writing and received on or before Friday, 5 July. No refunds will be issued after this date. There is a refund processing fee of $75. Experiences registrations are not refundable

Note:
Lost badges cannot be replaced. If you lose your badge, you must purchase a new registration.
SIGGRAPH 2019 CONFERENCE COMMITTEE

SIGGRAPH 2019 Conference Chair
Mikki Rose
Blue Sky Studios

Creative Development Director
Munkhtsetseg Nandigjav
Savannah College of Art and Design

Production Sessions Chair
Derrick Nau
DreamWorks Animation

ACM SIGGRAPH Frontiers Talks Chair
MK Haley
Walt Disney Imagineering

Education Liaison
Andrew Duchowski
Clemson University

Real-Time Live! Chair
Gracie Arenas Strittmatter
BioWare/EA

Adaptive Technology Co-Chairs
Natalie Rountree
Dylan Moore

Emerging Technologies Chair
Courtney Starrett
Seton Hall University

Student Volunteer Chair
Corinne Price
ICF

Art Gallery Chair
Brittany Ransom
California State University Long Beach

Experience Hall Manager
Christine Holmes
Blue Sky Studios

Studio Chair
Chrissy Cain
Santa Cruz Bicycles

Art Papers Editor
Everardo Reyes
Université Paris 8

Technical Papers Chair
Olga Sorkine-Hornung
ETH Zurich

Attendee Experience Manager
Joshua Grow
Zorroa

VR Theater Director
Maxwell Planck
Adventure Lab

Birds of a Feather Coordinator
Mark Elendt
SideFX Software

Virtual, Augmented and Mixed Reality Chair
Victoria Rege
Graphcore

Business Symposium Chair
Adele Newton
University of Waterloo

SIGGRAPH 2020 Conference Chair
Kristy Pron
Walt Disney Imagineering

Computer Animation Festival Director
Emily Hsu
Blizzard Entertainment

SIGGRAPH 2021 Conference Chair
Pol Jeremias-Vila
Pixar Animations Studio

Courses Chair
Michael Reed
Blue Sky Studios

Pathfinders Coordinator
Jim Kilmer
The OPAL Group

Posters Coordinator
AJ Christensen
National Center for Supercomputing Applications (NCSA)