

Art Papers

Art Papers Jury

Rachel Dickey is an assistant professor of architecture at the University of North Carolina Charlotte and founder of Studio Dickey, a public art and design practice. Recognizing that current technologies are increasingly affecting the production and experience of space, she explores through her research the use of machines and tools in design not only in terms of material manipulation, but also as instruments that affect people and their environments.

Francesca Franco is an art historian and curator based in Italy and the U.K. She is senior research fellow at the University of Exeter and visiting lecturer at Danube University Krems. In 2017 she curated *Algorithmic Signs* (Bevilacqua La Masa, Venice), an exhibition that explored the history of generative art. Franco is author of *Generative Systems Art: The Work of Ernest Edmonds* (Routledge 2018) and *The Algorithmic Dimension: Five Artists in Conversation* (Springer 2020).

Esteban García Bravo explores computational art as a researcher, a practitioner and an educator. He earned his MFA in 2008 and a PhD in Technology in 2013, and is currently an assistant professor of computer graphics at Purdue University.

Nicolas Henchoz is the director of the EPFL+ECAL Lab, the design research center from the EPFL, one of the two Swiss Federal Institutes of Technology. He drives projects focusing emerging technologies on user experience, while understanding human perception. His work promotes disruptive but sustainable innovation. He has curated more than 30 exhibitions and is the author of several publications, including the book *Design for Innovative Technology: From Disruption to Acceptance*.

Janina Hoth (MA in Theatre, Film and Media Studies—2015, University of Vienna; BA in Art History) is currently researcher and lecturer in the Department for Image Science at Danube University Krems, working on the Archive of Digital Art and developing projects in the field of Digital Art Archiving, Online Exhibitions and Digital Humanities. As a freelancer, she works as translator and author, and is developing her PhD thesis on Collective Aesthetics.

Kathy Rae Huffman is a freelance curator, networker, writer and media art collector and is cofounder of the FACES online community for gender, art and technology. Since the 1980s, she has consulted, curated, juried, administered and coordinated events for numerous international media art festivals and arts organizations. She currently resides in Southern California.

June Kim is a media art practitioner-researcher who currently teaches at UNSW Art & Design, Sydney, Australia. Her current research in virtual reality is to investigate the ways VR can challenge the dichotomous relationship between humans and between humans and non-humans. She was a SIGGRAPH Asia 2019 Art Gallery and Art Papers cochair.

Kris Layng is an award-winning set designer, director and XR researcher. He was nominated for an Art Directors Guild Award for MANIAC (Netflix) and cocreated and directed *CAVE* (SIGGRAPH 2018, Tribeca Film Festival 2019, winner of Best Art Paper Award SIGGRAPH 2019). He is the artist-in-residence at the NYU Future Reality Lab and cofounder of Parallax.

Patrick Pennefather is an assistant professor coappointed in the Department of Theatre and Film at the University of British Columbia and the Master of Digital Media Program in Vancouver. Pennefather is a sound designer, composer, teacher, instructional designer and researcher with a PhD in Educational Technology and Learning Design.

Ken Perlin is a professor in the Department of Computer Science at NYU, where he directs the Future Reality Lab. Research interests include future reality, computer graphics and animation, user interfaces and education. He is chief scientist at Parallax Inc., Tactonic Technologies and Autotoon Inc. Education: PhD in Computer Science from NYU; BA in Theoretical Mathematics from Harvard.

Daria Tsoupiakova is a professor in the School of Design and the Electronic Visualization Laboratory at the University of Illinois at Chicago. Her research and artwork explore the art of virtual reality and networked multiuser exhibitions for VR projection systems—such as *CAVE* and *CAVE2*. She designs computer graphics applications for educational multimedia and virtual rehabilitation for stroke survivors.

Anya Yermakova is a doctoral candidate and teaching fellow in the departments of Critical Media Practice and History of Science at Harvard University. Her work takes the formats of performance installation, music composition and movement research, as well as academic and creative writing. She is particularly interested in making interactive scores from unfinished archival snippets as a way of recovering intentions of uncelebrated people throughout history.

Art Papers External Reviewers

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Introducing the SIGGRAPH 2020 Art Papers

Andrés Burbano

The history of computation is the result of weaving together multiple cultural threads; one of the major threads is the relation of the arts to computation. Consider Ada Lovelace's comments on the Analytical Engine, designed by Charles Babbage in 1837; the early devices built by Konrad Zuse, including the Z3, developed in 1941 and the Graphomat 64, created in 1964 [1]; CSIRAC's experiments with computational sound in Australia in 1949 [2]; or the artworks made by Geraldo de Barros in Brazil using punched cards [3]. Art is a significant force that drives technical and scientific developments, and the contemporary landscape of research into the complex relationship between art and computation is increasingly vibrant.

According to scholar Warren Sack, this relationship precedes Babbage's and Lovelace's contributions. For example, the punched cards used to encode instructions to be processed by the Analytical Engine were already widely used in the textile industry. Moreover, Sack argues, various crafts and clerical practices anticipated computation in many senses, especially with regard to the notion of software that could be interpreted by a machine and to the idea that computers can be thought of as "language machines" [4]. A goal of the SIGGRAPH Art Papers is to explore these fundamental relationships and tensions, and to document how they continue to take on new forms relevant to our current age and our current technologies.

The SIGGRAPH 2020 Art Papers are the joint effort of ACM SIGGRAPH and Leonardo/ISAST, who for 12 years have been providing meaningful content within the conference and through this special issue of *Leonardo* journal. The 2020 call for papers focused on six tracks: Project Description; Contemporary Computational Art (including Theory/Criticism); Methods/Techniques of Creative Practices; Media Art History/Media Archaeology of Artifacts and the Arts; Experimental Design Practice; and Indigenous and Aboriginal Communities, Arts and Technology. Out of 141 submissions, 14 papers were selected, seven long papers and seven short papers. Additionally, this issue also includes an article that was awarded "Best Paper" in the Art Papers track for SIGGRAPH Asia 2019, chaired by Sarah Kenderdine and June Kim.

The long papers explore territories as diverse and complementary as augmented reality, activism, computational art history, artificial intelligence, spatiality and interactivity, social networking, genetics and cultural analytics. The following long papers were selected by the Art Papers jury:

"REALational Perspectives: Strategies for Expanding beyond the Here and Now in Mobile Augmented Reality (AR) Art," by Liron Efrat; "Inverse-Rendering-Based Analysis of the Fine Illumination Effects in *Salvator Mundi*," by Marco (Zhanhang) Liang, Shuang Zhao and Michael T. Goodrich; "Stepping Inside the *Classification Cube*: An Intimate Interaction with an AI System," by Avital Meshi and Angus G. Forbes; "*Resonant Waves*: Immersed in Geometry," by Richard Grillotti, Andy DiLallo and Angus G. Forbes; "Cultural Viz: An Aesthetic Approach to Cultural Analytics," by Everardo Reyes and Lev Manovich; "*Body RemiXer*: Extending Bodies to Stimulate Social Connection in an Immersive Installation," by John Desnoyers-Stewart, Ekaterina R. Stepanova, Bernhard E. Riecke and Patrick Pennefather; and "Enhanced Family Tree: Evolving Research and Expression," by Fan Xiang, Shunshan Zhu, Zhigang Wang, Kevin Maher, Yi Liu, Yilin Zhu, Kaixi Chen and Zhiqiang Liang.

The short papers mainly belong to the Project Description track, exploring interactive, immersive and computationally mediated experiences from AI, robotics, storytelling, sonic installations, neural networks, cinematic experiences and VR, among other topics and techniques. The following papers were selected by the Art Papers Jury:

"*the Unknown Person*," by Eddie Wong; "Animated Robotic Sculptures: Using SMA Motion Display to Create Lifelike Movements," by Akira Nakayasu; "Visual Indeterminacy in GAN Art," by Aaron



Hertzmann; “Hybrid Embroidery: Exploring Interactive Fabrication in Handcrafts,” by Yi-Chin Lee and Daniel Cardoso Llach; “*Pixel of Matter: New Ways of Seeing with an Active Volumetric Filmmaking System*,” by Seonghoon Ban and Kyung Hoon Hyun; “*Rilievo: Artistic Scene Authoring via Interactive Height Map Extrusion in VR*,” by Sevinc Eroglu, Patric Schmitz, Carlos Aguilera Martinez, Jana Rusch, Leif Kobbelt and Torsten W. Kuhlen; “Artistic License in Heritage Visualization: *VR Sydney Cove circa 1800*,” by Kit Devine; and “*Cacophonous Choir: An Interactive Art Installation Embodying the Voices of Sexual Assault Survivors*,” by Şölen Kıratlı, Hannah E. Wolfe and Alex Bundy. The work described in the last paper was submitted as an artwork to the SIGGRAPH Art Gallery and also appears in that section of this special issue.

In this moment, when universities across the world have suddenly changed their instruction to remote classes, immersive and telematic experiences from the arts could offer new possibilities that nurture and diversify the uniform, rigid and corporate aspects of online education. Due to the current pandemic, it may be necessary to rely on AI algorithms to predict outbreaks and analyze public health data, which play a crucial role in understanding the exponential growth of the COVID-19 virus and the people who will be affected. In their roles as data visualization and user interface designers who are experts at communicating complicated information to a wide range of audiences, artists can help tremendously in the translation from organized data to interactive interfaces. At the same time, the arts serve as a forum for criticizing the contemporary problems related to the overreach of technology, such as information overload and lack of trust in data in times of crisis. These topics are part of our society in the 21st century, and in this historical moment, I believe that it is still critical to share the passion, creativity and courage of the artists, designers, creative technologists and theoreticians featured in this special issue.

Before closing, I would like to express my sincere gratitude to Kristy Pron, Jenna Feldman and especially to the jury members, the vast network of reviewers and external reviewers, without whom a task like this would be impossible. The Art Papers track is because of you and for you.

References and Notes

1. Rojas, Raúl and Hashagen, Ulf, eds., *The First Computers: History and Architectures*, revised edition (Cambridge, MA: MIT Press, 2002).
2. Doornbusch, Paul, *The Music of CSIRAC: Australia's First Computer Music* (Australia: Common Ground, 2005).
3. Burbano, Andrés, *Geraldo de Barros: Iso*, Barros, Fabiana de, ed. (São Paulo, SP: Sesc, 2013).
4. Sack, Warren, *The Software Arts* (Cambridge, MA: MIT Press, 2019).

Andrés Burbano is a media artist and scholar who is currently associate professor in the Department of Design at Universidad de los Andes in Bogotá, Colombia. Burbano holds a PhD in media arts and technology from the University of California, Santa Barbara (UCSB). He was SIGGRAPH 2018 Art Gallery Chair.