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*on Computer Graphics and
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Proceedings of the ACM

on Computer Graphics and Interactive Techniques

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The proceedings of the ACM in Computer Graphics and Interactive Techniques (PACMCGIT) publishes original research of the highest quality dealing with all areas of computer graphics and interactive techniques including rendering, modeling, animation, and digital image processing as well as the visual computing and simulation elements of such disparate areas as computational fabrication, computational photography, physical modeling and control, user interfaces, video game techniques, and virtual and augmented reality. PACMCGIT broadly spans all of these areas as well as new areas that will develop under the wide umbrella of computer graphics and interactive techniques. The journal operates in close collaboration with the ACM special interest group on Computer GRAPHics and Interactive Techniques (ACM SIGGRAPH) with each issue devoted to a particular subject area within CGIT. All accepted papers receive two rounds of reviewing and authors can expect publication decisions within posted timelines.

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Cover image from "In Search of the Plastic Image: a Media Archaeology of Scan Processing", by Derek Holzer, in this issue.



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Editor's Note

PACMCGIT is pleased to present this issue which encompasses the program of the ACM SIGGRAPH 2022 Arts Papers, the second PACMCGIT issue working with the Arts Paper Chair and Jury of the annual conference. These papers represent the culmination of the merger of art and technology, as artists shape the cutting edge and understanding of digital art technology through their work and writing. PACMCGIT is proud to support the arts community through the publication and dissemination of this important work.

Victor Zordan
PACMCGIT Editor-In-Chief

Since the 1980s, the SIGGRAPH Art Papers have cultivated an evolving, multidisciplinary community of artists, researchers, and scholars at the nexus of technology, the arts, and the humanities. Today, this community is uniquely placed to shed light on the changing place of technology in the arts and — perhaps more intriguingly — the changing place of the arts in our technological society. Accordingly themed “Art/Tech Relocations”, this special issue collects the papers presented as part of the SIGGRAPH 2022 Art Papers program, which invited authors to recognize the instability — and interdependence — of these two concepts. Drawing a distinction between “art” and “artistry” (as Technical Papers are doubtlessly and delightfully artful in this sense), the papers here included underscore imagination, speculation, and critique as lenses to discover paths for artistic and technological exploration that circumvent industry expectations and take distance from commercial imperatives. This distance is essential, I believe, for the arts to fulfill their important mission to critically shape cultural understandings of technology; activate difficult questions about our increasingly mediated social lives; and subvert — and offer alternatives to — reductive or deterministic visions of technological progress that all too often ignore the social and environmental impacts, and unintended consequences, of technical systems.

Scholarship is never solely the work of individuals but of communities of knowledge production, and the review process is one key space where the Art Papers community interacts, deliberates, and grows. The members of the jury engaged with authors in a spirit of collegiality and generosity, and were absolutely essential to the issue: Freida Abtan, Gabriela Aceves Sepúlveda, Yana Boeva, Roberta Buiani, Benay Gursoy, Nicolas Henchoz, Anna Henson, Andrew Hieronymi, Rod Martin, Leonardo Parra, Annina Rüst, and Theodora Vardouli. I am also indebted to the external reviewers for supporting the jury, helping ensure that each paper received in-depth feedback by domain experts: Nik Aberle, Julieta C. Aguilera, Ardavan Bidgoli, Andy Buchanan, Ozguc Capunaman, ginger coons, Judith Doyle, Angus Forbes, Esteban Garcia Bravo, Janina Hoth, Conor McGarrigle, Daniel Pillis, Diego Pinochet, Everardo Reyes, Gustavo Rincon, Charlie Roberts, Tina Shah, Andrea Sosa, Victoria Szabo, Francesca Torello, Daria Tsoupikova, Graham Wakefield, Jessica Westbrook, and Fabian Winkler. Administrative support from Jenna Feldman, Leona Caffey, and Emma Siemsen was essential to ensure that the process ran smoothly and on time.

Authors submitted to one of four categories: *Projects and case studies* sought papers documenting a realized computational art or design project while positioning it within the state of the art, and critically reflecting on both the process and its results. *Methodological contributions* sought works documenting emergent methodological approaches to the practice and scholarship of computational art and design. *History, theory, and criticism* invited contributions offering new historical, theoretical, and critical perspectives on the technical artifacts, infrastructures, and communities enacting computational art and design. Finally, *Critical technical practices* sought works that do not fit neatly within disciplinary or methodological categories, and explore computer graphics and interactive techniques as arenas for critical or creative engagement with questions about affect, culture, society, and the environment. After the first round of reviews and careful deliberation, the jury selected 15 papers out of a pool of over 70 submissions. Over the course of several weeks, each of the selected papers was shepherded by a jury

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member who worked closely with the authors, communicating the reviewers' feedback and guiding them towards the final version. Attentively fine-tuned by Daniela Hönigsberg's deft editorial eye, the results are compiled in this special issue: a remarkably strong cohort of Art Papers, which is organized here along three thematic axes: *Intelligences*, *Realities*, and *Visions*.

The first section, *Intelligences*, features artistic research that mobilizes artificial intelligence and machine learning methods towards aesthetic, material, and cultural questions. In "Dream Painter: Exploring creative possibilities of AI-aided speech-to-image synthesis in the interactive art context" Mar Canet Sola and Varvara Guljajeva discuss an interactive robotic art installation that playfully puts algorithms and audiences in an art-making conversation. In "An Aquarium of Machines: A Physically Realized Artificial Life Simulation" Nathan L. Lachenmyer and Sadiya Akasha document and critically reflect on their development of conceptual artist Anicka Yi's installation *Aerobes* at the Tate Modern's Turbine Hall, immersing us in the computational techniques they put in motion to create the illusion of artificial life and sentience. In "Traditional African Dances Preservation Using Deep Learning Techniques" Adebunmi, E. Odefunso and coauthors present a detailed case study of the use of machine learning methods to creatively document and preserve cultural traditions. This submission was voted best paper by the Art Papers jury. In "Three Stage Drawing Transfer" Robert Twomey offers a lively and rigorously documented case study of human-machine artistic "collaboration", which is also on display in this year's Art Gallery. In "Woven Behavior and Ornamentation: Simulation-Assisted Design and Application of Self-Shaping Woven Textiles" Elizabeth Meiklejohn and coauthors present a simulation-assisted workflow for the design of woven fabrics where the material behavior of yarns is codified and incorporated into a computational framework following structural and aesthetic considerations. While AI methods are often believed to blur the boundary between humans and machines, these projects show how these techniques are themselves shaped by cultural practices and imaginaries held by the communities that make or appropriate them.

The second section, *Realities*, features works that mobilize virtual and augmented reality techniques to instigate new kinds of embodied and tangible experiences. Papers in this section show how, enabled by computer graphics and interactive techniques, artists and performers delineate new forms of spatial experience and human presence. In "FaceType: Crafting Written Impressions of Spoken Expression" Kevin Maher and coauthors document an interactive installation visually linking in real time a visitor's spoken expression with calligraphic responses. In "Groupthink: Telepresence and agency during live performance" Ali Hossaini and coauthors use hemodynamic sensors to bring physiological signals across the virtual divide in virtually-staged performances. In "Erratics on the road to Wigan Pier: The Creation of TouchAR" Chara Lewis and coauthors probe notions of creativity and collaboration in the production of interactive public artworks through an augmented-reality project grappling with the pandemic context as well as with environmental questions. In "A Tale of Two Productions: A Christmas Carol On Stage and in Virtual Reality" David Gochfeld and coauthors report on the imaginative use of real-time motion capture, virtual humans, game engine rendering, and multi-user VR as resources in the context of a theatrical performance, offering a glimpse of how the challenges of the pandemic may have instigated a profusion of techniques in support of the performative arts.

Over the course of the last sixty years, computer graphics have come to shape not only what we see but also what counts as seeing. The final section, *Visions*, features artistic research using computer vision, image capture, and visualization techniques as vehicles for artistic expression, civic engagement, or historical inquiry. In "Field of Leaves: An Interactive Installation Sprouting Leaves Out of Public Money" Pedro Silva and coauthors create an elaborate visual language to make data from Portugal's public contracts visible to a broad public through an interactive installation. In "The Ghost in The Machine: Digital Stylization and Expressive Re-Materialization of Ancient Ceramics" Sharan R. Elran and Amit R. Zoran explore issues of cultural preservation, self-expression, and authorship through the use digital capture and 3-D, CAD/CAM methods to re-materialize ancient ceramic artifacts. In "In Search of the

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Plastic Image: A Media Archaeology of Scan Processing” Derek Holzer documents his rigorous media-archaeological examination of scan processing, an analog electronic image manipulation technology, including technological reenactments and historical insight. In “KineCAM: An Instant Camera for Animated Photographs” Ticha Sethapakdi and coauthors present an open source camera for capturing and fabricating kinegrams — a classic animation technique involving a sliding stripped overlay across an interlaced image to create the effect of frame-by-frame motion. In “Below Victory: Subsurface Radar Advances for Creative Digital Heritage” Scott Hessels engages with a GPR scan of 2,000-year-old Gallo-Roman temple ruins below the plaza of a gothic cathedral in France, presenting a series of data visualizations and design experiments that challenge conventional approaches to digital cultural heritage.

Together, these papers paint a compelling picture of an evolving community creatively expanding — and critically reflecting on — the arts’ technological repertoires. They also hint at a world where artistic and scholarly sensibilities guide, rather than follow, technological innovations. All my gratitude to the authors and reviewers who are this community’s living engine. It’s been an honor.

Daniel Cardoso Llach

SIGGRAPH 2022 Art Papers Chair