HYPERSEEING
Special Issue on SMI-SCULPT 2024

Shape Modeling International 2024
Shape Creation Using Layouts, Programs, & Technology (SCULPT) Event

Twenty third Interdisciplinary Conference of the International Society of the Arts, Mathematics, and Architecture

Online Event
July 14, 2024

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CONTENTS

Preface

History of Shape Creation Using Layouts, Programs, & Technology (SCULPT) Event

The SCULPT event began as an experimental extension of the Shape Modeling International (SMI) conference in 2012. Originally titled the Fabrication and Sculpting Event (FASE), it debuted at SMI 2012 and returned again at SMI 2013. Both events were met with enthusiastic responses to the FASE papers and presentations. Although there was no FASE event at SMI 2014, the success of the initial editions led us to continue FASE as part of the SMI conference annually from 2015 to 2021.

In 2013, Nat Friedman—Chair of the International Society of the Arts, Mathematics, and Architecture (ISAMA)—approached me with the idea of organizing the event as an annual ISAMA conference. I proposed the suggestion to the SMI Steering Committee, which unanimously supported the idea. As a result, the event now also serves as the Twentieth Interdisciplinary Conference of ISAMA.

ISAMA itself has a rich and meaningful history. The first Art and Mathematics Conference (AM 92) was organized by Nat Friedman at SUNY Albany in June 1992. This was followed by annual events AM 93 through AM 97 in Albany and AM 98 at the University of California, Berkeley, co-organized with Carlo Séquin. ISAMA was officially founded by Nat Friedman in 1998, and the ISAMA publication Hyperseeing was co-founded by him and me in 2006.

Over the years, the art/math movement has grown significantly, with the emergence of new conferences and organizations. Notably, the Bridges conference, launched by Reza Sarhangi in 1998, has become highly successful, with excellent proceedings and international recognition. The importance of the art/math movement is also highlighted by the prominent art/math exhibit at the annual Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, organized by Robert Fathauer.

In 2022, we renamed the event SCULPT to better convey its mission. SCULPT stands for Shape Creation Using Layouts, Programs, & Technology. Unlike other math/art conferences, SCULPT is uniquely focused on the physical realization of 3D shapes. We primarily invite submissions from practitioners such as sculptors and architects to describe their creative methods. These contributions, along with the discussions they spark, are expected to raise new questions and challenges for theoretical research in shape modeling.

In 2023, we introduced a new *Show and Tell* event as part of SCULPT, held virtually via Zoom. In this format, participating sculptors briefly present their work in 5-minute segments. Each session has featured more than 15 artists, showcasing a wide range of creative processes and techniques. This informal yet dynamic platform has helped foster greater engagement and community among artists, designers, and researchers. Beginning with this edition, we now include the showcased works as part of the official proceedings, helping to document and share the contributions of our creative participants more broadly.

Ergun Akleman

Editor, Hyperseeing

Preface

Shape Creation Using Layouts, Programs, & Technology (SCULPT) 2023

There are at least two aspects to shape modeling: theoretical and practical. The mathematical and theoretical aspects of shape modeling have traditionally been supported by the SMI conference. With the Fabrication and Sculpting Event (FASE) our goal is to include more hands-on, application-oriented ways by designers and sculptors who construct sophisticated real-world objects.

FASE has its own program committee, and the accepted papers are published in Hyperseeing. With FASE, we hope to attract practitioners who might usually be less inclined to write papers containing formal algorithms or mathematical proofs, but who nevertheless have important things to say that are of interest to the shape modeling community and who also might provide visually stimulating material.

For this year's Fabrication and Sculpting Event, we solicited papers that pose new questions and motivate further research in designing, fabrication and sculpting. Topics should be useful, for example, in the following areas: Fabrication of digital models, Advanced manufacturing techniques such as additive manufacturing, laser cutting or CNC milling, Interactive or procedural design of manufacturable shapes, Interconnections of complex modeling and fabrication processes, visually stimulating fabrication techniques or printed structures.

Thus, the scope of FASE is the intersection of shape modeling and fabrication methods/algorithms, and papers may focus on both the digital/theoretical and the physical domain or just one of these domains – as long as the connection to the other domain is clear. It is not a requirement that the techniques presented in the paper involve computation as such, but they need to have a clear algorithmic or mathematical element.

We received six submissions this year and three of them were accepted as regular papers. The three accepted papers span a wide range of topics and views on the fabrication process of various artistically interesting artifacts. We wish to thank the authors and the reviewers for their participation in the SMI/ISAMA 2024 SCULPT Event. We hope that new ideas and partnerships will emerge from the FASE papers that can offer a glimpse into a much larger territory and the event can enrich interdisciplinary research in Shape Modeling. We hope that the attendees of SMI 2024 will enjoy this event of the conference.

Oleg Fryazinov, and Carlo Séquin

SCULPT Papers chairs