

## Editorial

Shape Modeling International (SMI) 2024 awards interviews with SMI'2024 award winners<sup>☆</sup>

## 1. Introduction

Shape Modeling International Organization (SMI) is an international forum for the dissemination of new mathematical theories and computational techniques for the modeling, simulation, and processing of digital representations of shapes and their properties to a community of researchers, developers, students, and practitioners in various fields [1].

Initiated in 1997 by Tosiyasu L. Kunii (see Fig. 1), the symposium became an annual event in 2001 after its merge with the Eurographics/ACM SIGGRAPH Workshop on Implicit Surfaces. In Fig. 2, there is a photo of the SMI 2001 conference where its organizers, Bianca Falcidieno and Tosiyasu Kunii, can be recognized. The symposium venue rotates in turn between Asia, Europe, and the United States. Proceedings until 2010 are available at DPLP, computer.org, and IEEE Explore. Since 2009, SMI proceedings have been published by Elsevier as a special issue of the *Computers & Graphics* journal.

The SMI council was formed in 2020 and consists of previous SMI conference organizers [2]. The SMI Council's charge is to maintain the quality and visibility of the SMI conference and to actively promote it. The SMI Council established the SMI awards in 2020 after the passing of Tosiyasu Kunii [3,4].

The committee established two awards in 2021. In honor of Tosiyasu Kunii (1938–2020), the Distinguished Researcher Award was established to recognize shape modeling researchers with distinguished careers. The Young Investigator Award was established to recognize young researchers who are in the first seven years of their careers and have made significant contributions to shape modeling. The Service Award commemorates Alexander Pasko (1960–2022) [5] (see Figs. 3, and 4) and was established in 2023 to recognize contributions to the organization of SMI conferences.

## 1.1. Award nominations

The awardees are selected by the SMI Awards Committee (see Section 1.2), based on nominations from the Shape Modeling community. Nominations can be made in a formal letter format. Self-nominations are also considered. The nomination letters should provide a clear description of the contributions of the candidate to the shape modeling research and the SMI community. Nomination proposals can be accepted by the SMI awards committee at any time. The awards are presented at the Shape Modeling Conference and the award recipients are invited to give a speech at the Conference. The awards also include interviews with award winners. This allows a casual discussion of the research areas, insights, and contributions of the award winner.

## 1.2. Award committee

The SMI council developed rules in the SMI bylaws [2] to form a separate award committee to handle the award in 2021. According to the current SMI bylaws, the SMI Award Committee consists of four members. These members are selected from the members of the SMI Council by the SMI Council. The members are elected for a four-year period, and one member is replaced per year by election. Each year, a member of the award committee is elected as the chair by award committee members. The chair collects nomination letters and interviews award winners.

The initial 2021–22 committee was selected from the SMI council members and consisted of Ergun Akleman, Loic Barthe, Michela Spagnuolo, and Brian Wyvill (chair) in alphabetical order. In 2023, Bianca Falcidieno replaced Michela Spagnuolo. In 2024, Jorg Peters replaced Loic, and Bianca Falcidieno became the chair of the committee. In conflict of interest cases, only the committee members without conflict of interest make the decision.

## 1.3. Award winners

The first three Distinguished Researcher awardees were Bianca Falcidieno (2020), Marie-Paule Cani (2021), and Wenping Wang (2023) for their outstanding career achievements in shape modeling research. This year, Gershon Elber and Stefanie Hahmann were recognized as Distinguished Researchers for their contributions to Shape Modeling Research.

The first three Young Investigator awards were presented to Mélina Skouras (2020), Teseo Schneider (2021), and Étienne Corman (2023) for their contributions to shape modeling research during the first seven years of their career after the completion of their Ph.D.s. This year Gianmarco Cherchi and Amal Dev Parakkat were recognized as Young Investigators based on their exceptional contributions to Shape Modeling early in their career.

The first Alexander Pasko service award was presented to Dr. Michela Spagnuolo in 2023. This year, Ergun Akleman was recognized as a service award winner for his exceptional contributions to the Shape Modeling Community.

SMI'2024 took place from 12 to 14 July in Detroit, Michigan, USA. The conference was held at Wayne State University. Wenping Wang, 2023 SMI Distinguished Award winner, gave a keynote speech on Friday, July 12. The award session was held on Saturday, July 13, 2024. Distinguished award winner Stefanie Hahmann and Service award winner Ergun Akleman gave two 20-minute acceptance talks

<sup>☆</sup> This article was recommended for publication by Prof. J. Jorge.



Fig. 1. Tosiyasu Kunii in his 60th birthday celebration in 1998.

during the session. The other 2024 award winners will give talks at the next two SMI conferences. At night, there was also a dinner for all organizers, keynote speakers, and award winners at the top of the Renaissance tower in Detroit (see Fig. 5). The tower is also the headquarters of General Motors. What follows are the interviews with the 2024 award winners.

## 2. Kunii award winner: Gershon Elber

Gershon Elber is a professor in the Computer Science Department at Technion, Israel. His research interests span computer-aided geometric design and computer graphics. Elber received a Bachelor's Degree in Computer Engineering and an M.Sc. in Computer Science from Technion, Israel, in 1986 and 1987, respectively, and a Ph.D. in Computer Science from the University of Utah, USA, in 1992. He is a member of the SIAM and the ACM. He was a Visiting Professor at the University of Washington, at the Boeing Company in 2006–2007, and at MIT in 2018, and founded GeomCore, a geometry-related company, on his sabbatical in 2000.

Elber has served on the editorial board of the Computer Aided Design, Computer Graphics Forum, The Visual Computer, Graphical Models, and the International Journal of Computational Geometry & Applications and has served on many conferences' program committees including Solid Modeling, Shape Modeling, Geometric Modeling and Processing, Pacific Graphics, Computer Graphics International, and Siggraph. Elber was one of the paper chairs of Solid Modeling 2003 and Solid Modeling 2004, one of the conference chairs of Solid and Physical Modeling 2010, the chair of GDM 2014, the conference co-chair of SIAM GD/SPM 2015, and the conference co-chair of SPM 2018. He has published over 250 papers in international conferences including SMI [6–9] and journals, received 15 best paper awards, presented a dozen keynote plenary talks, and is one of the authors of a book titled "Geometric Modeling with Splines - An Introduction". Elber received the Ray and Miriam Klein - the Technion Research Award, in 1998, the Hershel Rich - Technion Innovation Award in 2002 for "Virtual Marionettes - Remote Collaboration Animation and Interaction" and in 2019 for "Volumetric Modeling Solutions", the CodeArt award in 2003 (National Art in Computing Contest, third place), the John Gregory Memorial Award, 2011, in "Appreciation for Outstanding Contributions in Geometric Modeling", the Solid Modeling Association pioneers award in 2016, and the Bézier award in 2019.

Elber was the Vice Dean for computing and teaching, in the CS department, Technion - Israel Institute of Technology, in 1997–1999 and 2002–2004, respectively, and was the Deputy Vice President for computing at the same institution in 2010–2013. He is now the head of the Technion Centre for additive manufacturing & 3D printing (<https://tamc.technion.ac.il>). Elber can be reached at the Technion, Israel Institute of Technology, Department of Computer Science, Haifa 32000, ISRAEL. Email: gershon@cs.technion.ac.il, WWW: [www.cs.technion.ac.il/~gershon](http://www.cs.technion.ac.il/~gershon) and [www.gershonelber.org](http://www.gershonelber.org)

### 2.1. Gershon Elber interview

**Question:** What is your current research field?

**Answer:** I have always worked amid computer graphics and geometric modeling (GM) while in recent years, my focus has been more towards GM. That said, I have always enjoyed harnessing my expertise in related areas such as 3D design/s of so-called impossible objects (<https://gershanelber.org/EscherForReal>) [8] and woodworking (<https://gershanelber.org/WoodWorking>).

**Question:** Where did you complete your formal education?

**Answer:** My Bachelor's and Master's degrees are from the Technion, in Israel. My PhD work was done at the University of Utah, working with Elaine Cohen. Elaine has had a profound impact on the research directions I have taken thereafter.

**Question:** What was your first job?

**Answer:** I joined the Technion immediately after completing my PhD, and I have been working there ever since.

**Question:** What was your first publication?

**Answer:** Fruited from my Master's degree, together with my advisor Moshe Shpitalni, we published a result on automatic (dis)assembly of 3D structures, using Octrees. Interestingly, during my first year as a PhD candidate, Elaine and I worked on algorithms for hidden curve removal for freeform spline models. The paper was accepted to Siggraph so with my then broken English, my first ever international presentation was in front of an audience of several thousand Siggraph attendees...

**Question:** How and when did you first get involved with Shape Modeling?

**Answer:** I think that my first exposure to the leading teams of shape modeling was in 1993. I just graduated and started a new career at the Technion. I attended two conferences in Europe. The first was in Lausanne (I think it was CGI) and the second was a workshop in GM in Genova, organized by Bianca Falcidieno and Tosiyasu Kunii. Both events had a tremendous impact on me. I met Kunii for the first time. I met Bianca for the first time. I met Michela for the first time (we took the train together from Lausanne to Genova). Then, I also met Myung Soo Kim for the first time. Myung Soo invited me to visit him in Korea after these conferences and the rest is history. Since then, we have had close to thirty academic publications together — about a publication every year!

**Question:** What is your favorite memory of an SMI conference and when was your first?

**Answer:** I always enjoyed SMI as it was more open. CAGD (computer aided geometric design) and SPM (Symposium on Solid and Physical Modeling) events are more mathematically and engineering-oriented events, respectively. In contrast, SMI was more open, and artistic publications were not uncommon there. A recent publication I had with Myung Soo in SMI was on the design of 3D puzzles [10]... I have always liked this broad-mindedness, and was very happy to see the emergence of FASE and later on SCULPT as a sub-event in SMI, which I have been contributing to over the years.

**Question:** Who are your research mentors? How did they inspire and support you along the way?

**Answer:** Before I came to Utah for my PhD, I knew very little about GM and splines in particular. The time I spent in Utah altered that – I met and was influenced by Elaine, Rich Riesendfeld, and the entire Alpha\_1 team there. Utah was a Mecca for CAGD then and researchers from all over the world came and gave inspiring talks, like Tom Lyche and Tom Sederberg (see Figs. 6–10).

**Question:** What can you point to in your career as your proudest moment?

**Answer:** Unfortunately, I cannot identify a single moment or event as my proudest. Very early in my career, I started developing my own geometric modeling kernel (<https://gershon.cs.technion.ac.il/irit>). This was due to having no access to the source code of existing kernels, kernels I wanted to experiment with, modify, and have full control of. I



Fig. 2. Bianca Falcidieno, Hans-Peter Seidel, Toshiyasu Kunii, Roberto Scopigno, and Geoff Wyvill in front row in Genoa during one of the sessions of SMI'2001.



Fig. 3. Alexander Pasko in SMI'2004 in Genoa, Italy.



Fig. 4. Alexander Pasko (at the right, front) with Marie-Paule Cani, Brian Wyvill, John Hart and Michela Spagnuolo (from left to right, front), in SMI'2010 in Aix-En-Provence, France.

believe that this kernel made me and my team members, students, post-docs, researchers, and engineers, much more competent, and am very happy about this early decision. By now, this kernel has state-of-the-art features that exist virtually in no other place, like mixed numeric and symbolic manipulation of multivariate splines that allowed Myung Soo and me and others to devise computation algorithms for freeform intersections, offsets, bisectors, convex hulls, and kernels, etc., and of volumetric spline representations that allow for seamless support of graded heterogeneity and conformal lattices, that are critical these days towards additive manufacturing. Then, this kernel has always been free, at the source code level, to all the academic community and is been used in hundreds of locations, all over the world. In fact, many of my international collaborative efforts have been greatly augmented due to this kernel.

**Question:** How do you feel your work has made an impact in your field or community?

**Answer:** I would like to think it has... While some of the algorithms we have developed over the years appeared in commercial software, I think the main impact is yet to unfold. The GM field has made a tremendous impact on the world, looking at the progress of the car, ship, and aerospace industries, in the last fifty years. Going from drawing boards to computer-based design systems was a huge leap. Yet, in these fifty years, little has changed in GM. Some of the deficiencies GM had all along are still with us today. One example is the poor link between the design and the analysis stages in GM, and some analysis researchers are already working on a remedy, most noticeably isogeometric analysis. Another inadequacy in contemporary GM has surfaced in recent years with the emergence of new (additive) manufacturing technologies that allow for the fabrication of generally shaped lattices and/or functionally graded heterogeneous artifacts. In fact, never before have the fabrication/manufacturing abilities been ahead of contemporary CAGD tools. The GM world must undergo another major leap as a result, and I believe that our kernel, which aims to resolve these deficiencies, can make an impact here.

**Question:** What advice would you give to aspiring individuals in your field?

**Answer:** Find your own path, commit to it, and do not follow trends. While the CAGD field seems mature, we are at exciting times when the field must undergo major changes, as I have mentioned. Find the path you can make your impact in and pursue it.



**Fig. 5.** SMI'2024 organizers, keynote speakers and 2024 award winners (From left to right): Tao Ju, Jorg Peters, Jing Hua, Georges-Pierre Bonneau, Hao (Richard) Zhang, Ergun Akleman, Stefanie Hahmann, Wenping Wang, and Zichun Zhong.



**Fig. 6.** Gershon Elber is with Elaine Cohen and Richard Riesenfeld in 2023 in Utah.



**Fig. 7.** Gershon Elber is with Myung Soo Kim in 2012 in Huangshan, China.

### 3. Kunii award winner: Stefanie Hahmann

Stefanie Hahmann is a professor at the University Grenoble INP, France, and a member of the INRIA research team Anima, part of Laboratoire Jean Kuntzmann. A graduate in Mathematics from the TU Braunschweig and University Paris VI, she received a Ph.D. in Computer Science from the University of Kaiserslautern in 1994. Her research focuses on geometric modeling and computer graphics. She is interested in the development of geometric models and computational tools for the expressive representation, synthesis, modeling, and computational fabrication of shapes. Grounded in the differential geometric properties of free-form surfaces, her work mainly centers on the creation of user-friendly algorithms that make the design and manipulation of 3D virtual objects more accessible to users [11]. Contributions over the years include high-level models for 3D shapes and animation, reconstruction of shapes from sketches and sensor data [12,13], multiresolution methods, feature detection [14], shape deformation tools, applications to CAD/CAM, my early surface fairing and interrogation algorithms. Stefanie Hahmann was program co-chair and general co-chair of many international conferences in the field of shape modeling and has organized five Dagstuhl seminars on Geometric Modeling. She served on the steering committees of SMI, SPM, and SIAM GD and is now a member of the editorial boards of Computer Aided Design (CAD) and Computers & Graphics. In France, she led the French Geometric Modeling Working Group (GTMG) part of CNRS for more than a decade. Stefanie Hahmann is a Fellow of the Solid Modeling association, and in 2022, the Alexander von Humboldt Foundation awarded her the Gay-Lussac Humboldt Prize.

#### 3.1. Stefanie Hahmann interview

**Question:** What is your current research field?

**Answer:** First of all, I'd like to thank you, Bianca, and the Awards Committee. Receiving this award is an extraordinary honor for me. My research field has always been Shape Modeling. Over the last 30 years, I have contributed to many different topics such as surface interrogation and fairing, G1-splines of arbitrary topology, multiresolution methods, CAD interfaces and assemblies, shape structure and topology, surface deformation and reconstruction [15], computer animation,



**Fig. 8.** Stefanie Hahmann with Georges-Pierre Bonneau in SMI 2024 at the Wayne State University, Detroit .

sketch-based modeling [16], developable surfaces [17], geometric design of microstructures, digital fabrication. Currently, I'm interested in 3D sketching and computational design of bending active surfaces.

**Question:** Where did you complete your formal education?

**Answer:** In Germany, I first completed my degree in mathematics and computer science at the TU Braunschweig in 1991. I had always been very attracted by France. At school, French was my main subject alongside math. I had the opportunity to study there for a year funded by a DAAD Master scholarship. Back in the 80s, it was anything but straightforward to study abroad. So, I obtained a second master's degree at the Université Pierre et Marie Curie (Paris VI) in Applied Mathematics. I then came back to Germany to pursue my doctorate at the University of Kaiserslautern in Germany.

**Question:** What was your first job?

**Answer:** After my PhD I applied in France to a Maître de Conférences position at many Universities. This is an early-career position with tenure status. I received offers for a permanent position from Paris, Nantes, and Grenoble respectively, and had a difficult choice to make because all three positions were associated with excellent laboratories. In the end, I chose Grenoble because the IMAG-LJK laboratory in France was known for treating math and computer science as a unit in research. This was very important to me because of my background. In 1995, I was recruited as an Associate Professor at ENSIMAG (École Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble). Part of the Grenoble Institute of Technology (Grenoble INP), ENSIMAG is a prestigious French engineering school specializing in computer science and applied mathematics. The snow in winter and skiing have always been my favorite hobby, so Grenoble was the ideal place for that too.

**Question:** What was your first publication?

**Answer:** In 1992, during my PhD, we published my first paper on generalized focal surfaces a surface interrogation method enabling to visually highlight surface imperfections and higher order discontinuities. I presented it at the IEEE Visualization conference in Boston to an audience of several hundred people. In those days the Q&A after talks could be quite intensive, and you had to defend firmly your scientific positions in front of an audience that did not hesitate to question them harshly.

**Question:** How and when did you first get involved with Shape Modeling?

**Answer:** At the TU Braunschweig during my studies, I was very fortunate to be able to attend courses in CAGD with Wolfgang Böhm and Geometric Modeling and Computer Graphics with Hans Hagen. Both gave outstanding lessons in which they presented the subject in a very interactive and lively way. It was fascinating. At the time, I also had a student job supervising the mathematics library. This left me plenty of time to browse the journals, including CAD and CAGD in particular. The latter was a very young journal, founded by Wolfgang Böhm and Bob Barnhill just a few years before in 1984. I finally enjoyed a semester's work on Gregory Patches so much that I decided to write my Master thesis in CAGD about implicitization of parametric curves and surfaces.



**Fig. 9.** Stefanie Hahmann with IMAGINE-Inria team in 2012, when Marie-Paule was the head of the team.

**Question:** What is your favorite memory of an SMI conference and when was your first?

**Answer:** Since my first SMI conference in Cambridge, USA in 2005, I have participated in almost all SMI conferences and published 9 papers there. I have fond memories of all the conferences, especially Aix-en-Provence 2010, Berlin 2016, and Berkeley 2017, but for me, the most impressive of all was Matsushima in 2006. The location was heavenly, the trip was a real adventure and, as it was my second SMI conference, I got to know many new colleagues.

**Question:** What can you point to in your career as your proudest moment?

**Answer:** The moment for which I am most grateful occurred early in my career, when in 1995, Bob Barnhill, then Vice President of research at Arizona State University, whom I had already met earlier during my thesis, invited me and Georges-Pierre Bonneau to visit ASU for a few months. At the time, it was a CAGD Center of Excellence. During this period, we had the opportunity to work with Greg Nielson on wavelets in computer graphics, which culminated a year later in a joint publication on BLaC-Wavelets. The famous paper by Tony de Rose et al. on wavelets for computer graphics had just been published, and for me, it marked the start of several works on multiresolution methods. During this time at ASU, we also met Gerald Farin, Dianne Hansford, and Tom Foley, who gave us a very warm welcome. We will always remember the best times with Gerald and Dianne. It was Gerald's work on the geometric continuity of triangular patches that inspired our work on G1 splines - which we started shortly afterward.

**Question:** Who are your research mentors? How did they inspire and support you along the way?

**Answer:** If I were to name only one mentor, this would be Hans Hagen without hesitation. Although I was on my own thematically and geographically in France after my doctorate, we always stayed in touch. Hans not only introduced me to research in a very open-minded way but also to the management of a research team at the highest level. I learned the importance of making and maintaining international contacts. In fact, working internationally has been what I enjoy most about my job since then. Participating in major European projects such as the RTN Mingle (led by SINTEF), the FP7 NoE Aim@Shape (led by Bianca Falcidieno, CNR-IMATI) and the Horizon 2020 FET OPEN ADAM2 (led by Michael Barton, BCAM) was very motivating. After my Ph.D., I had the opportunity to meet and learn from so many scientifically strong and inspiring colleagues. I would like to mention Marie-Paule Cani from Ecole Polytechnique and Gershon Elber from Technion. I wrote several papers with them. In addition to their scientific expertise, they both show tremendous energy and optimism at work, and this is very refreshing to work with them.



Fig. 10. Gianmarco Cherchi, presenting his “first” article in Berlin in 2016.

**Question:** How do you feel your work has made an impact in your field or community?

**Answer:** The direct impact of one’s own scientific papers is hard to assess. Therefore, more than about my paper’s citation I’m very proud of all the amazing students that I had the great chance to teach at the undergraduate level and to supervise during their PhD. Many of them are now active in animation studios, in R&D in large companies, and in academic research. I’m especially proud to have supervised the PhD of Basile Sauvage who is today a full professor at the University of Strasbourg, Damien Rohmer who is now a full professor at the Ecole Polytechnique, and Camille Schreck who is a Research Scientist at INRIA Nancy today.

**Question:** What advice would you give to aspiring individuals in your field?

**Answer:** Even though we now have the options of videoconferencing and home office, in my opinion, personal contacts are still the most important asset in our environment. So, my advice would be not to stay at home but to meet and discuss with people in the lab or at conferences whenever possible. Of course, we shouldn’t travel so much and too far anymore. But in my opinion, personal contacts are the most important building block for collaboration and joint projects on an international level. For this reason, I would give priority to the young researcher to be able to continue traveling.

#### 4. Young investigator award winner: Gianmarco Cherchi

Gianmarco Cherchi is a Computer Science Researcher — Assistant Professor (non-tenure track) at the Department of Mathematics and Computer Science of the University of Cagliari (Italy), where he earned his BSc, MSc, and PhD. His research interests are Computer Graphics and robust geometric processing, focusing on surface and volumetric mesh generation, optimization, and digital fabrication [18–20]. He is also a professor of “Data Visualization” (Applied Computer Science and Data Analytics BS.c) and “Web Programming” (Computer Science BS.c) courses at the University of Cagliari.

##### 4.1. Interview with Gianmarco Cherchi

**Question:** Where did you complete your formal education?

**Answer:** I was born and grew up in Sardinia (Italy), so I decided to start my university career here on my island. I enrolled in the Computer Science degree program at the University of Cagliari, thinking I could start my education close to home and then move abroad in the following steps. However, my plans took a different turn. From the first year of my bachelor’s degree, I joined the Computer Graphics research group in my department: CG3HCI. I then decided to continue with the master’s degree in Cagliari and continue my activities in this group. Even with low expectations, I then applied for the Ph.D. program in Cagliari and unexpectedly received a doctoral fellowship, leading me to conduct also my doctoral research on the island. However, at that point,

I felt the need to explore the world of research beyond my comfort zone. For this reason, the period for which I joined the Titane research group supervised by Pierre Alliez at INRIA (France) was crucial for my Ph.D. I had one of the most significant (and beautiful) experiences of my education during that time. In fact, as soon as I had the opportunity, I replicated the experience.

**Question:** What was your first publication?

**Answer:** My first publication was an extension of my Bachelor’s thesis, entitled “AR Turn-by-turn navigation in small urban areas and information browsing” [21]. However, I prefer to recall as my first publication the paper “Polycube Simplification for Coarse Layouts of Surfaces and Volume” [22], which I co-authored with Marco Livesu and Riccardo Scateni. This article stemmed from the project that I started during my master’s thesis and continued during the first months of my Ph.D. I still remember that I was so excited and stressed (it was my first real deadline) that during the night I dreamed of a quad-layout on the skin of people close to me (I am still not sure if it was a dream or a nightmare). Thanks to this article and the concept that I explored while preparing it, I decided to focus my research on these subjects.

**Question:** How did you first get involved with Shape Modeling?

**Answer:** I was born in the early 1990s and grew up with Disney cartoons. I still remember my amazement when Pixar released the first “Toy Story” in 1995. It was the first time I had seen a cartoon with animated 3D objects and I immediately fell in love with it. How could that box with a flat screen show three-dimensional objects? How can it be possible to model and manipulate these objects? The curiosity was born early in my life and has never gone away. When I decided to study Computer Science at the university in 2010, I was sure of the topics I wanted to explore.

**Question:** When did you start your research in Shape Modeling and why?

**Answer:** After I completed my first year at the university, Riccardo Scateni organized a summer internship reserved for 4–5 students who had finished all their exams. The students had to choose whether to spend their summer at the beach or work in a basement laboratory known as the “BatCave” at the university (recall that we are in Sardinia). The BatCave was the headquarters of the GC3HCI group, which dealt with topics such as Computer Graphics and Human-Computer Interaction. It was a perfect experience for me. I finally had the opportunity to study and work with the 3D shapes that have fascinated me since my childhood. That was my first approach to these topics, and modeling a pyramid and rendering it with OpenGL was my first task. Five years later, Riccardo Scateni will become my Ph.D. advisor.

**Question:** Who are your research mentors? How did they inspire and support you along the way?

**Answer:** There are three people that I can call mentors in my young career. The first is without a doubt Riccardo Scateni. Riccardo has believed in me since my first year of university and has never stopped it. I owe Riccardo the opportunity to approach these disciplines with passion and enthusiasm. Thanks to Riccardo, I have learned crucial lessons about research and teaching, and I hope one day to learn how to approach life as lightly as he does. The second fundamental person for me is Marco Livesu, a.k.a. Cino. I started working with Cino during my master’s thesis and have never stopped. My most relevant articles are all in collaboration with Cino. Thanks to him, I learned almost everything I know about my research topics, and thanks to him, I overcame the moments when I felt inadequate for this work. He is a colleague who became a friend. Another person to whom I owe a lot is Davide Spano. Davide has always been a reference point for me as a researcher. He is honest and direct, qualities that I have always appreciated about him. In addition, Davide has helped me in difficult times, giving me unconditional help when needed.

**Question:** What can you point to in your career as your proudest moment?

**Answer:** In 2020, I won a research position. I was excited for this new adventure, but the pandemic forced us to lock down. I must



**Fig. 11.** Gianmarco Cherchi with collaborators. Left to right: Riccardo Scateni, Gianmarco Cherchi, Davide Spano and Marco Livesu.

admit that my mental well-being suffered significantly during this time. I found it difficult to focus, work, or do anything productive. The lockdown exacerbated all my negative feelings and I considered quitting my research career. However, just as I felt like I had hit rock bottom, a collaborative effort with my colleagues (including Cino and Riccardo) resulted in the creation of one of the articles I am most proud of: my first Siggraph article [20]. This raised me up and boosted my self-confidence again. Looking back, the period I am most proud of in my career is not that article, nor any specific article, but it is the moment that I decided, despite the difficulties, not to give up! Of course, I am also extremely proud to receive this “SMI award”. Thank you :)

## 5. Young investigator award winner: Amal Dev Parakkat

Amal Dev Parakkat has been working as a tenured Assistant Professor (Maitre de Conferences in French) at LTCI-Telecom Paris, Institut Polytechnique de Paris, since September 2021. Parakkat was born in Kerala, India. He is interested in practical algorithms for digital content creation tasks with the main focus on Sketch-based interfaces [23]. He also works on fundamental problems in digital geometry processing, including reconstruction and meshing [24–26]. He leads the ANR SketchMAD project on novel algorithms for sketch-based modeling (2024–2028) and heads the IGD masters at the Institut Polytechnique de Paris. He regularly serves on program committees of Eurographics, Pacific Graphics, Shape Modeling International, and Computer Graphics International and will be the technical paper chair of Expressive 2025.

## 6. Interview Amal Dev Parakkat

**Question:** Where did you complete your formal education?

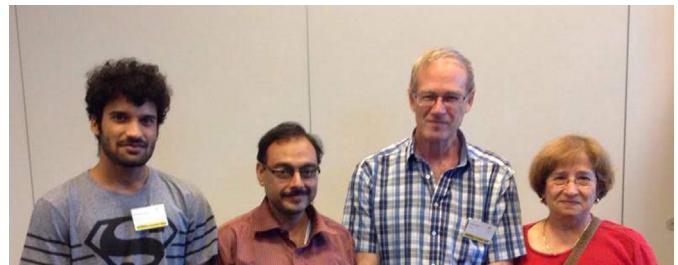
**Answer:** I completed my formal education at three Indian institutes. I earned my Bachelor’s degree in Computer Science with Honors from the University of Calicut in Kerala. I then pursued a Master’s degree in Computer Science at Mahatma Gandhi University, Kerala, graduating with first rank. Subsequently, I obtained a PhD in Computer Graphics with Institute Research Award from the Indian Institute of Technology Madras.

**Question:** What was your first publication?

**Answer:** My first formal publication was my M.Sc. thesis on Contour Extraction from Noisy Binary Images, published in CAD&A in 2015.

**Question:** How did you first get involved with Shape Modeling?

**Answer:** During the initial stage of my Ph.D., our plan was to investigate the deformation of materials. Since I did not find that topic particularly interesting, I began searching for an alternative topic. At that time, I happened to see the “Interactive Computer Graphics” course on Coursera given by Takeo Igarashi. I was incredibly excited after watching this course and subsequently read all the publications of Takeo (especially “Teddy”), which helped me decide which field I wanted to dedicate my career to.



**Fig. 12.** Amal Dev Parakkat with his advisor Ramanathan Muthuganapathy, his advisor’s advisor Gershon Elber and his advisor’s advisor’s advisor Elaine Cohen in SMI 2016.



**Fig. 13.** Amal Dev Parakkat with Marie-Paule Cani, his postdoc advisor, and SMI’2022 distinguished award winner.

**Question:** When did you start your research in Shape Modeling, and why?

**Answer:** I began my research on Shape Modeling at the beginning of my Ph.D. in 2015. The two main reasons why I like Shape Modeling are: (1) it combines creativity and artistic skills with Computer Science, and (2) the aesthetic satisfaction we get while working in this field is unparalleled.

**Question:** Who are your research mentors? How did they inspire and support you along the way?

**Answer:** I am proud to have had four remarkable individuals as my research mentors: Marie-Paule Cani, Elmar Eisemann, Takeo Igarashi, and Ramanathan Muthuganapathy.

Marie-Paule Cani was my postdoctoral advisor at Ecole Polytechnique (now part of Institut Polytechnique de Paris) and she unconditionally supported me in every aspect. Her pleasant and humble nature, combined with her unwavering support, always creates a positive and encouraging environment. I have learned (and continue to learn) a lot from her, including intuitive approaches to problem solving and finding effective solutions with ease. In addition, her pioneering technical knowledge, exceptional presentation skills, and insightful thinking make her an invaluable mentor and role model.

Elmar Eisemann was my advisor during my postdoctoral research at TU Delft. He is always pleasant and taught me how to formalize my vague, random ideas. Moreover, he taught me to frame and write technical papers in a very concise and effective manner. His supportive nature and his ability to have a far-reaching vision helped shape my academic and professional skills. In addition, his patience and willingness to provide constructive feedback make him a remarkable mentor.

Takeo Igarashi was my internship supervisor at the University of Tokyo. It was an honor to work with him, as it was his work that attracted me to this fascinating field. He always provides very constructive and expert comments to improve my ideas. His knowledge and expertise as a pioneering expert in the field make him an exceptional mentor with whom I love working. His dedication and passion for the subject are a great inspiration.



Fig. 14. Amal Dev Parakkat with the research group.

Ramanathan Muthuganapathy was my PhD advisor at the Indian Institute of Technology Madras, and deserves full credit for transforming me from an engineer into a researcher. He unconditionally supported my ideas and was always available when I needed help. He also provided me with complete freedom and flexibility to work in the field that I found most interesting. His guidance and support played an important role in my academic and professional development (see Figs. 11–15).

**Question:** What can you point to in your career as your proudest moment?

**Answer:** In my career, there are several things that I am particularly proud of. First of all, I am proud to have very supportive people around me, including family, mentors, friends, students, and colleagues. I am also proud to join Telecom Paris — IP Paris, a prestigious institution that has provided me with invaluable opportunities and resources. I also take great pride in being able to work in an area that perfectly aligns with my hobbies, such as sketching and watching animated movies, which makes my work deeply fulfilling and enjoyable.

## 7. Service award winner: Ergun Akleman

Ergun Akleman is a professor in the School of Performance, Visualization, and Fine Arts. He also works jointly with the Computer Science and Engineering Department. Akleman has been in Texas A&M University for almost 30 years. He received his Ph.D. degree in Electrical and Computer Engineering from the Georgia Institute of Technology in 1992. Akleman is a living embodiment of transdisciplinary teaching, research, and creative activities. He has published more than 250 papers in leading journals and conferences in a wide variety of disciplines from computer graphics, computer-aided design, and mathematics to art, architecture, and social sciences. His Erdős and Bacon numbers are both two. In other words, he is close to both the core of mathematics research and movie making. He is also a professional cartoonist who has published more than 500 cartoons. He has a bi-monthly corner called Computing through Time in the Flagship magazine of IEEE Computer Society, IEEE Computer. He also has a weekly column on the history of science in the magazine ‘Herkese Bilim ve Teknoloji’. He has illustrated and written a few children’s books. He also wrote several popular science articles with his own illustrations. His most significant and influential contributions as a researcher have been in modeling with shape algebras. He has developed methods for implicit modeling [27–29], orientable and non-orientable 2-manifold and 3-manifold meshes [30–33]; subdivision surfaces [34]; modeling woven surfaces, links and knots [35,36]; physical construction [37–39]; and partitive geometry [40,41]. His work on orientable manifold meshes has resulted in a powerful shape modeling system, called TopMod [42]. He teaches both technical and artistic elements of computer graphics in his courses. Now, almost 100 students have received graduate degrees under his supervision. Most of his former students now work in companies such as Pixar, Disney, DreamWorks, Digital Domain, Google, Amazon, and Facebook.



(a) Data Visualization Before Computing Era or Before Computers.  
(b) Data Visualization in Computing Era or After Digital.

**Fig. 15.** Two frames from a science cartoon of Ergun Akleman that is published in IEEE Computer [43]. Before 1850, all diseases were believed to be spread by “bad air”, called miasma. In 1854, Dr. John Snow, who believed that there might be another reason for the cholera outbreaks, plotted all cholera cases on a street map of the area and realized that the epidemic was actually spreading via water from a particular pump on Broad Street. This is considered to be the first scientific discovery obtained by using data visualization.



Fig. 16. Ergun Akleman with Jim Foley.

### 7.1. Interview with Ergun Akleman

**Question:** What do you do, and how long have you been doing it?

**Answer:** I was a professional cartoonist first. I started when I was 16 years old in high school. I was also very good in math and science. I also received a very prestigious Future Scientist scholarship for high school students from the Scientific and Technological Research Council of Turkey. I completed my BS in Engineering. So, Computer Graphics was the natural choice for me. During my career starting with PhD, I was mainly interested in representing, modeling, and visualizing shapes. By working with shapes, I naturally fell in love with geometry, topology, and algebra. Google classifies me now as a mathematician. On the other hand, I am strongly interested in and involved in practical applications, from modeling to visualization, engineering to architecture, and arts to science. My cartoon in Fig. 15(a) shows one motivation to go to higher dimensions.

**Question:** Where did you complete your formal education?

**Answer:** I started with mechanical engineering in Istanbul Technical University, since it was the most popular program in the university entrance exam in 1976. Then, I realized that Electronics could be a more rapidly growing field and I moved to an Electronic engineering program in the same university. When I completed my BS in Electronic Engineering, a computer science MS program was opened in the College of Electrical Engineering and I started in that program as both an MS student and research assistant. I was also drawing cartoons in one of the largest newspapers in Turkey against the military government at that time. Interestingly, I still received PhD scholarship from the



**Fig. 17.** 2023 Alexander Pasko service award winner, Michela Spagnuolo, and Alexander Pasko in SMI'2006 in Matsushima, Japan .(photo by Ergun Akleman, the 2024 service award winner).

Turkish Government in 1983. I came to the US knowing only a little English when I was 25 years old. It should be noted that I also have a severe hearing problems. While I was fairly known in Turkey, I suddenly became nobody in the US. This is mostly because since I grew up in Turkish, I most likely read lips. In English, I did not have the luxury. I learned English in the US and was accepted to the Electrical and Computer Engineering (ECE) department at Georgia Tech. At that time, Georgia Tech did not have a Computer Graphics faculty. Bruce Naylor was there but left. I started to work with one of the pioneers of Fractal Geometry, Michael Barnsley, from the math department. I was pretty bored and was thinking of leaving US and returning to Turkey. Then, in 1989 Siggraph came to Atlanta. I was hooked. At the conference, I learned that the Computer Science Department at Georgia Tech has hired Larry Hodges. The first day he came to school, I found him and asked to work with him. He became my PhD co-advisor with Russell Mersereau from ECE. They like my creativity and gave me complete freedom. I initially tried to develop a theory that encompasses fractal geometry, parametric surfaces, and implicit surfaces. With their guidance, I focused on implicit surfaces and completed my PhD in 1992. I was also lucky that Georgia Tech decided to invest in Computer Graphics. Graphics, Visualization, and Usability (GVU) Lab was founded. During my PhD, Holly Rushmeyer (Mechanical Engineering), Jim Foley (see Fig. 16), Brian Guenter, and Jessica Hodgins joined Georgia Tech. I learned a lot from them.

**Question:** What was your first job?

**Answer:** Since I had scholarship support, I needed to return back to Turkey and work there at least for two years. At that time, there were not many Computer Science departments. I started at Yildiz Technical University as an assistant professor. I also taught at Bosphorous and Marmara Universities. In 1995, when my mandatory time was over, I started to work at Texas A&M University.

**Question:** What was your first publication?

**Answer:** My first publication was a mathematics paper that combined Bézier curves and Fractal Geometry. Using these, I have obtained curves that are derivative continuous everywhere. I drew a Ronald Reagan caricature with these curves. It was published in one of the obscure local computer science conferences. I do not have a copy of some of my early publications including that one. Google Scholar does not list them.

**Question:** What is your favorite memory of an SMI conference and when was your first?

**Answer:** My first SMI conference was the Implicit Surfaces Workshop 1996 organized by Kees van Overveld in Eindhoven. I already met with Kees in several conferences before. He was a great person. Unfortunately, we also lost him very early. In 1996, I was looking forward to meeting with Brian Wyvill. A year before, I was in the Graphics Interface. But Brian was not there. Anyway, at the same conference, I also met Alexander Pasko, Marie-Paule Cani, John Hart for the first time. In Implicit Surfaces 1999, we decided to join SMI. I had two papers in SMI 1999 [29,30], but I could not go to Japan



**Fig. 18.** Alexander Pasko and Michela Spagnuolo (behind the glass) in SMI'2010 in Aix-En-Provence, France. (photo again by Ergun Akleman).



**Fig. 19.** Ergun Akleman with Ed Catmull in 2023. Ed Catmull contributed history of subdivision day in SMI 2020.

because of some complications with my green card application. Instead of me, my collaborator Jianer Chen attended the conference. He told me that Kunii was excited with our work [30], which eventually became the basis of our work on orientable mesh modeling. My first SMI was in 2001 in Genoa, where I met first time with Tosiyasu Kunii, Bianca Falcidieno, Michela Spagnuolo, along with the Wyvill brothers Brian and Geoff. Since then, I always tried to attend SMI (see Figs. 17–19).

**Question:** What was your most memorable service contribution to the Shape Modeling community?

**Answer:** I remember Brian invited me to discuss the future of Implicit Surfaces in 1999. I also remember Marie-Paule suggested that I organize SMI'2012 in the United States. However, it was not clear to me when I started to be part of the original SMI Steering Committee. It sort of happened naturally. When I organized SMI'2012, I introduced the SCULPT (formerly FASE) workshop and the Sculpture exhibition. Next year in SMI'2013, Alexander wanted to continue with SCULPT in Bournemouth. Now, SCULPT has become an integral part of the SMI conference for 12 years in a row. I have organized SMI one more time in 2021. At that time, I have introduced “history” workshops. I think my strong contribution to SMI is partly due to the development of better hearing aids and Zoom. In physical meetings, it was still hard for me to follow every discussion. However, in Zoom, I feel that I am close to every participant and I can hear them well. In such environments, I can be very effective. In other words, only after COVID, I started to impact more in Service. One problem with the original SMI Steering Committee was that it was an ad-hoc committee and it has been static for a long time. I was instrumental in creating by-laws for SMI. Based on bylaws, we created SMI council and we were able to formally create and elect a Steering committee. I suspect that is why I was selected as the award winner this year.

**Question:** How do you feel your work has made an impact in your field or community?

**Answer:** My research is mostly theoretical. It, therefore, takes a longer time to be recognized. SMI played a key role in the visibility of my work over the years. Now, engineers discovered some of my early work in shape modeling and current work in partitive geometry. With Vinayak Krishnamurthy, we started to form engineering teams and publish extensively in high impact journals. It is interesting that

my yearly citations seem to be exponentially increasing during the last few years. The main problem I have is that we have so many ideas that I am afraid that many of them will not ever be completed. In terms of the Shape Modeling community, I dream of developing a conference similar to Siggraph, with sculpture exhibitions, and architectural and art presentations in addition to theoretical presentations. I strongly believe that there will be strong cross-cultivation between multiple disciplines. Geometry Summit which can combine multiple geometry conferences can be such a forum.

**Question:** What advice would you give to aspiring individuals in your field?

**Answer:** Meeting, listening, and discussing with the best researchers is the most important thing to learn. Papers never tell the whole story. Sometimes, a single word can make you understand the idea. Do not try to read papers line by line. A paper is the result of countless failures and nobody can talk about those failures. After reading the paper, do not become discouraged and feel like the idea is already done. Unless you copy line by line, you will most likely find a new way. You will also find many ways to fail. If your new approach is significantly different, you can publish it by carefully explaining why and how it is different.

## Data availability

No data was used for the research described in the article.

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