Computers & Graphics 137 (2026) 104612

Contents lists available at ScienceDirect

Computers & Graphics

journal homepage: www.elsevier.com/locate/cag

Editorial

Shape Modeling International (SMI) 2025 awards: Interviews with SMI'2025 award winners☆

Bianca Falcidieno [a], Ergun Akleman [c,*], Stefanie Hahmann [b], Jorg Peters [d]

[a] CNR, Italy
[b] Université Grenoble Alpes, France
[c] Texas A&M University, USA
[d] University of Florida, USA

ARTICLE INFO

Keywords:
Shape Modeling International
Awards
Interviews

ABSTRACT

The Shape Modeling International awards (SMI awards) were introduced to commemorate the passing of SMI founder, Professor Kunii. Since 2021, the SMI awards recognize exceptional contributors to Shape Modeling. Currently, there are three awards: the Tosiyasu Kunii Distinguished Researcher, the Young Investigator, and the Alexander Pasko Service Award. The 2025 Distinguished Researcher awardees are Brian Wyvill and Hong Qin. The 2025 Young Investigators are Chiara Romanengo and Guillaume Cordonnier. The 2025 Service Awardee is Yang Liu. This article provides interviews with the five SMI 2025 award winners.

1. Introduction

In 2025, the Shape Modeling International (SMI) Conference was co-located with the Solid and Physical Modeling (SPM) Conference. The jointly held conferences took place from October 29 to November 2, 2025, at the Dragon Hotel Hangzhou in Hangzhou, Zhejiang, P.R. China. Figs. 1 and 2 show the organizers who were able to attend in person.

1.1. History of SMI and SMI awards

Shape Modeling International (SMI) is a global community dedicated to advancing the mathematical and computational foundations of shape modeling. It serves as a premier forum where researchers, developers, educators, and practitioners come together to exchange ideas, present innovations, and explore new methods for modeling, simulating, and processing digital shapes and their properties [1].

Initiated in 1997 by Tosiyasu L. Kunii (see Fig. 3), the symposium became an annual event in 2001 after its merge with the Eurographics/ACM SIGGRAPH Workshop on Implicit Surfaces. Fig. 5 shows a photo from the Implicit Surfaces 1998 workshop. The symposium venue rotates among 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 promote it actively. 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] and was established in 2023 to recognize contributions to the organization of SMI conferences.

1.2. Award nominations

The awardees are selected by the SMI Awards Committee, 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 candidate's contributions 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

☆ This article is part of a Special issue entitled: 'SMI 2025' published in Computers & Graphics.

* Corresponding author.
E-mail addresses: bianca.falcidieno@gmail.com (B. Falcidieno), ergun.akleman@gmail.com (E. Akleman), stefanie.hahmann@inria.fr (S. Hahmann), jorg.peters@gmail.com (J. Peters).

https://doi.org/10.1016/j.cag.2026.104612
Received 28 April 2026; Accepted 29 April 2026
Available online 7 May 2026

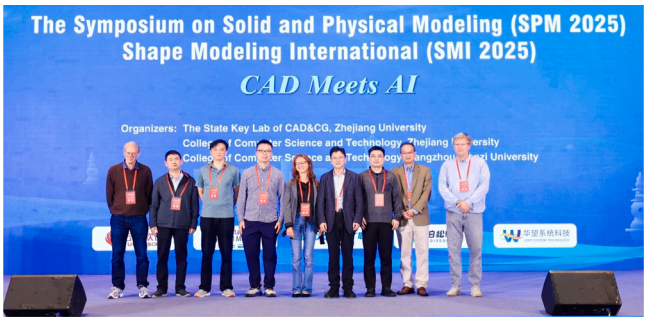

Fig. 1. A group photo of the organizers of the jointly held 2025 conferences Solid and Physical Modeling (SPM'2025) and Shape Modeling International (SMI'2025).

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.

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 2025, Stefanie Hahmann replaced Brian Wyvill. In conflict of interest cases, only the committee members without a conflict of interest make the decision.

1.3. Award winners

The Distinguished Researcher awardees during the first four years were Bianca Falcidieno (2020), Marie-Paule Cani (2021), Wenping Wang (2023), Gershon Elber (2024), and Stefanie Hahmann (2024) for their outstanding career achievements in shape modeling research. This year, Brian Wyvill and Hong Qin were recognized as Distinguished Researchers for their contributions to Shape Modeling Research (see Fig. 4).

The Young Investigator awards during the first four years were presented to Mélina Skouras (2020), Teseo Schneider (2021), Étienne Corman (2023), Gianmarco Cherchi (2024) and Amal Dev Parakkat (2024) for their contributions to shape modeling research during the first seven years of their career after the completion of their PhD. This year, Chiara Romanengo and Guillaume Cordonnier were recognized as Young Investigators based on their exceptional contributions to Shape Modeling early in their career.

The two Alexander Pasko service awards were presented to Michela Spagnuolo (2023) and Ergun Akleman (2024). This year, Yang Liu was recognized as a service award winner for his exceptional contributions to the Shape Modeling Community.

2. Kunii award winner: Brian Wyvill

Brian Wyvill studied physics at the University of London and attended Bradford University as a graduate student, one of the few Universities in the Uk where computer science was offered in the early 1970s. Along with the late Ray Earnshaw, he was one of the first to gain his PhD in computer graphics in the Uk. As a post-doc at the Royal College of Art, he helped build a computer animation system used for the Hollywood film, "Alien" (see Fig. 6).

Brian joined the University of Calgary faculty, in 1981. His work focused on developing algorithms for implicit modeling and animation [6–10]. in 1986, with his brother, Geoff Wyvill, he pioneered the first iso-surface polygonizer, followed by implicit texturing, and the BlobTree, which became part of the GraphicsJungle animation project with colleague, Prof. Przemek Prusinkiewicz. In 2006 he joined the computer science department at the University of Victoria in British Columbia with a Canada Research Chair, where he continued to publish papers in Implicit Modeling and some combining computers and art. Many of his early papers were in collaboration with Geoff Wyvill, and the late Kees Van Overveld. He has collaborated with many colleagues, including Marie-Paule Cani, Loic Barthe, Jules Bloomenthal, Alyn Rockwood, Andrea Tagliasacchi and Sheelagh Carpendale (see Fig. 7).

With Marie-Paule Cani, Brian started the Implicit Modeling series of conferences, which later merged with Shape Modeling International. One of his mentors in his career was the late Professor Kunii. He was on the board of the Visual Computer for many years and was active in organising many conferences inspired by Prof. Kunii, such as CGI and SMI. He was on the executive for Eurographics and ACM SIGGRAPH, helping with the organization of specialized conferences, and later as SIGGRAPH VP for seven years (see Fig. 8).

Brian retired from the University at the end of 2018 and spends his time rock climbing, writing novels and software for visualizing timelines of a novel, as well as composing and arranging music. His piece for strings: The West Coast Trail Lament was performed in Victoria by the DieMahler Ensemble led by violinist, Pablo Dimeckie (see Fig. 9).

2.1. Brian Wyvill interview

Question: What is your current research field?

Answer: I still do some work in shape modelling since retiring from teaching, but mainly I have moved into visualization. After publishing my first novel I became aware that dealing with complexity in a hundred thousand word (plus) novel often told in a non-linear manner, is best handled using some visualization. My software, SceneWizard reads in the text of a novel and produces a variety of views of the information flow and timelines to ease the task of the writer (see Fig. 10).

Question: Where did you complete your formal education?

Answer: I studied Physics at the University of London, and in my final year was teaching myself to program in Algol 60 (punched cards on an Elliot 4120). At that time, however, rock climbing occupied my weekends and involved hitch-hiking to the mountains of North Wales on Friday afternoon. Unfortunately, that clashed with the lab. time for my final year project, and by the end of term, I was missing quite a few data points. The lab teaching assistant had given me a program to compute the results from the data points, and by reverse engineering, I could write a procedure for taking the expected results and computing the missing data. From that moment, I was determined to build my career around computers as they had the power to allow me to go climbing at the weekends! There were very few universities offering graduate degrees in computer science in the late 1960s, one of these was Bradford University, where my brother, Geoff had a job as a lecturer. Also, a much better location for rock climbing than London. After guidance from my brother, I graduated with my PhD in 1976, with a thesis based on recursive data structures applied to generation of graphics for art and design (see Fig. 11).

Question: What was your first job?

Answer: I followed up by working as a post, doc. At the Royal College of Art in London. There I was building an animation system for use by artists and helping develop an existing system 'Frolic' by

Fig. 2. A detailed group photo of the organizers of the jointly held SPM'2025 and SMI'2025 conferences. From left to right: Gershon Elber (Kunii Awardee 2024), Hongwei Lin (SMI 2025 Technical Paper Co-chair), Yang Liu (SMI 2025 Communication Co-chair), Zichun Zhong (SMI 2025 Technical Paper Co-chair), Michela Mortara (SMI 2025 Technical Paper Co-chair), Weiwei Xu (SMI & SPM Conference Co-chair), Qiang Zou (SMI & SPM Local Coordinator), Yunbo Zhang (SPM 2025 Program Co-chair), and Michael Barton (SMA Executive Committee Chair). The three organizers — Georges-Pierre Bonneau, Ergun Akleman, and Silvia Biasotti — were unable to attend.

Fig. 3. Shape Modeling International founder Tosiyasu Kunii in Geneva 1988. From Geoff Wyvill Archive.

Colin Emmet. We used this system to make some sequences for the first Alien movie in the late 1970s. I was paid seven pounds an hour to work on Alien. A fortune for a PhD graduate, especially useful when Alien director, Ridley Scott kept us waiting at Shepperton Studios for six hours to report to him on the progress of the animation.

Question: What was your first publication?

Answer: My first paper was in Software Practice and Experience in 1977, titled "Pictures-68";. In the paper I described my work on recursive hierarchical graphical data structures applied to a set of procedures, written in the ALGOL 68R programming language, based on my PhD thesis work.

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

Answer: In 1995, while I was working as a professor at the University of Calgary, Marie-Paule Cani and I started a series of workshops, sponsored by Eurographics, on Implicit Surfaces. In 2001 we merged the conference with SMI, which that year took place in Genova. I had already met many of the researchers involved in this community and it was a good fit, mainly because it was better to use a title that was about a problem, i.e. modeling shapes, rather than a solution using implicit surfaces. The merger exposed both communities to a wider range of papers and gathered together more researchers to help keep SMI alive into the future. 6. What is your favorite memory of an SMI conference, and when was your first? My brother and I attended the first SMI conference in early March 1997 at the University of Aizu in Japan. The event was organized by Prof. Kunii and Bianca Falcidieno. It was there that I first introduced our BlobTree modeling work, providing a structure in which space warping, CSG and implicit modeling could be managed, although it wasn't called the BlobTree until later. I also got to meet two researchers who would have a very positive impact on my work, Alexandra Pasko and Vladimir Savchenko. At SMI97, I remember asking Alexander if he would play chess with me, as I had never played a Russian and there was a chess set in the Japanese bath house. He said I should play Vladimir Savchenko instead. Maybe I was not a good enough player for Alexander, I will never know! Playing Vladimir was an amazing experience. None of his moves were expected or made sense to me, yet after perhaps fifteen moves, he checkmated with a knowing smile. I had not understood the game at all! In 2002 SMI came to Canmore, Alberta, where I was also living at the time. I remember at that SMI. Prof. Kunii presented his work on homotopy, opening my eyes to something very fundamental and presenting a theoretical concept to make it relevant to current Shape modeling research. Vladimir had visited me before, and one evening after the sessions many of us gathered at my house. Valdimir went straight to the freezer where, on a previous visit, he had left a bottle of good Russian vodka. I opened up the chess set, he opened up the vodka. It was time for a return match. The crowd gathered and, armed with the knowledge of an easy defeat for me the last time, Vladimir was expansive and generous in his moves. I was also generous, with the amounts of vodka poured into his glass, not mine. Armed with the knowledge of our previous game, he knew he would defeat me easily and played accordingly, not wishing me to lose too fast. Once the vodka started working, I caught him in a fork and won against a Russian! I cannot let him play me again; he will be wise to my tricks and I will lose in a few moves (see Fig. 12).

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

Answer: At Bradford my brother, Geoff was my guide in all things computer science. He also pushed me towards computer graphics and my PhD project extended his work. Later, in Calgary, he also was the prime mover in getting me interested in what became known as implicit modeling. We had several joint publications in the 1980s and 1990s. When I came to Calgary one of the professors and indeed an ex. Bradford lecturer, Graham Birtwistle became my mentor. He taught me how to write papers and how to develop crazy ideas into solid research. Prof. Kunii was always a great mentor, and supporter of my work and wrote letters to tenure and promotion committees on my behalf. In the early days at Calgary, I met Fred Park on a visit to NYIT. He shared the first wire mesh human face data with me and I worked with the late David Hill and then student, Andrew Pearce to build the first example of an automatic lip synched speaking face. Fred also invited me to speak in his SIGGRAPH facial animation tutorials. Andrew went on to become head of research at Dreamworks. Through the late Ray Earnshaw's 1980s NATO funded workshops, I met various people with whom I later

Fig. 4. 2025 Distinguished Researcher Award winner Brian Wyvill with his brother Geoff Wyvill. The photo on the left was taken in Geneva in 1988. The remaining photos are from Boston in 1991. In the right photo, they are eating lobster with Nadia Magnenat-Thalmann.

Fig. 5. Brian Wyvill with Kees van Overveld, Jules Bloomenthal, and Alexander Pasko at the Implicit Surfaces workshop in Seattle, 1998. Kees and Jules organized the 1996 and 1998 Implicit Surfaces workshops. Sadly, we lost Kees on 16 December 2014 and Alexander on November 15, 2022.

Fig. 6. Brian Wyvill with members of the Rocky Mountain Shakespeare Company, where he performed for many years (established in 1993).

worked. Roy Hall helped me make one of the implicit movies shown at SIGGRAPH. The late Kees van Overveld and I collaborated on a large number of projects and subsequent publications. Through the shape modelling world many people encouraged me, such as Malcolm Sabin, Robin Forest and the old guard at SIGGRAPH such as Henry Fuchs, John Hughes, Jim Blinn, Mary Whitton, and Turner Whitted. Despite the competitive nature of academia, people in computer graphics are often generous with their time and help to new researchers. Mentoring students often works both ways. I owe a lot to my many excellent students, thank you all of you, without whom I would not be receiving this award (see Fig. 13).

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

Answer: My work on implicit modeling began in 1985 with the visit of my brother, Geoff, to Calgary. We worked on a polygonizer to visualize iso-surfaces in a scalar field (in tar sands oil reservoir) for a Provincial government led research organization. This work was published in the The Visual Computer in 1986 and was more efficient than the later Marching Cubes, which was published later in 1987. Another highly memorable project was The BlobTree paper with then postdoc., Eric Galin. The paper won best paper in SMI and a somewhat improved version appeared in Computer Graphics Forum. I was proud of that work as it formed the foundation for many subsequent projects. Another proud moment was at SIGGRAPH 1986 in Dallas, when my movie "SOFT" was shown in the electronic theatre. Back in the flying logos era it was very unusual to see something like an implicit model change its shape. In this case the letters SOFT consisting of implicit primitives contoured itself up a flight of stairs. There was an audible gasp from the audience, which I will never forget. Of course, receiving the Kunii award is also a very proud moment for me.

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

Answer: Through my visits to Xerox PARC as a nofee (unpaid researcher) introduced me to many researchers who have had an impact on my career and the collaborative work that followed an impact on the community. Jules Bloomenthal was a fellow enthusiast in implicit modeling and convinced me to try and introduce some uniformity for naming for the area as well as the function names, the naming confusion has been great in this area. I have tried to do this through my papers, and my chapter in the influential textbook, Fundamentals of Computer Graphics (Marschner and Shirley). Jules also published an excellent implementation of our polygonizer via Graphics Gems, which had an impact by being well used. Later the work I did with my students on the BlobTree, texturing, ray tracing, functional warping, and many other implicit modeling techniques developed with collaborators such as Jules Bloomenthal, Loic Barthe, Alyn Rockwood, Marie-Paule Cani, Joaquim Jorge, Eric Galin, Marco Tarini, Andrea Tagliasacchi and a great number of wonderful students, has contributed to the fact that implicit modeling is now used by many companies building modeling systems such as nTop, Frustum, Altair, Autodesk, Seequent, and Siemens (see Fig. 14).

Fig. 7. Many faces of Brian Wyvill as an actor. These frames are taken from an archival video in which he portrays Scrooge. In that production, a farm cat unexpectedly wandered onto the set and stole the scene.

Fig. 8. Brian Wyvill is an avid mountain climber. In the left two images, Brian is climbing on the island of Kalmnos, Greece, in 2025. In the right two images, Brian is pioneering a new route on the Mouse's Tooth, Joffre Creek, British Columbia in 2024 with his son, Simon.

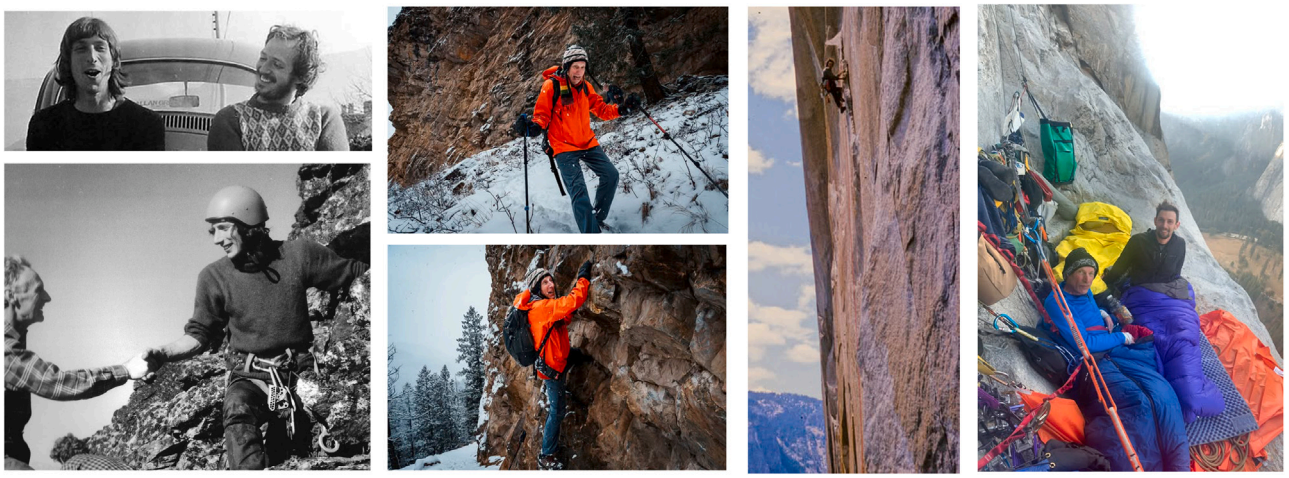

Fig. 9. In the top-left image, he is with Ray Evans in Deniolyn during an adventure weekend circa 1970. In the bottom-left image, he is with the renowned Norwegian guide and war hero Arne Randers-Heen, after topping out on the French route on the Trolltind Wall. This was Brian's first big wall, and the ascent took eight days in traditional big-wall style. In the center-left image, he is in "the 'hood" (Mount Hood) on a ski holiday, taking a snowy hike on a rest day. In the center-right image, he is on an ascent of the North America Wall on El Capitan in 1972. In the right image, he is with his son Simon Wyvill, who lent Brian his sleeping mat after Brian's sleeping bag had disappeared on the Salathe Wall, El Capitan, in 2019.

Fig. 10. Brian Wyvill at SIGGRAPH. In the top-left image, he is with Jessica Hodgins, Joaquim Jorge, and Marisa Ginger Tontaveetong. In the bottom-left image, he is with Joaquim Jorge and Dave. In the center image, he is with Lego Alain (a Lego sculpture of Alain Chesnais). On the right, he is with Turner Whitted, the inventor of ray tracing, standing in front of the physical replica of the first ray-traced image.

Fig. 11. Brian Wyvill at SIGGRAPH in Vancouver, with Alyn P. Rockwood and Ken Anjyo.

Fig. 12. Brian Wyvill's hand, visibly swollen and blotchy after being stung by a wasp on the ring finger knuckle, photographed at his brother Geoff Wyvill's home in Dunedin, New Zealand.

Fig. 13. Brian Wyvill with his Ph.D. student Lucky's (Li Ji) convocation ceremony at the University of Victoria. Lucy received his diploma from UVic's chancellor, Shelagh Rogers.

Fig. 14. Brian Wyvill playing the piano after giving a personal tour of the scenic coastline of Oak Bay and Uplands to a friend, followed by dinner at the Penny Farthing Pub in Victoria, BC, Canada.

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

Answer: Some time ago I received a review from SIGGRAPH that read: "As many have pointed out, implicit modeling has not been seen in SIGGRAPH for some time". This was the main reason for rejecting my submitted paper. In other words, doing research other than mainstream (at that time meshing papers dominated) will not be accepted by the research community. The reviewer went on to say that the model examples in that submission were not produced by a professional designer and therefore not acceptable. In other words, you would need a very large grant to afford professional design assistance. I would give the opposite advice. Whatever misguided reviewers say, don't be discouraged. Stick with your ideas that may not follow the current trends of the day. Be as creative as you can, avoid the mainstream research or at least question the assumptions on which it is based, otherwise you will likely make only an incremental contribution. There can be pushback against original thinking that is outside the popular way of doing things, but try to be innovative, and do your best

Fig. 15. Hong Qin on the SUNY Stony Brook campus in the fall, with trees showing their autumn colors.

Fig. 16. Two of Hong Qin's former Ph.D. students in 2006 Doctoral Hooding Ceremony in Stony Brook University, Professor Xiaohu Guo (left) currently at University of Texas - Dallas, and Professor Ying He (right) currently at Nanyang Technological University in Singapore.

with the resources available. Your crazy ideas could one day become the mainstream, and lastly, don't be afraid to approach well known researchers in your field for help, advice and collaboration (see Fig. 15).

3. Kunii award winner: Hong Qin

At present, Dr. Hong Qin is a Professor of Computer Science in Department of Computer Science at Stony Brook University (SUNY at Stony Brook). He received his B.S. degree and his M.S. degree in Computer Science from Peking University, China. He received his Ph.D. (1995) degree in Computer Science from the University of Toronto. During his years at the University of Toronto (UofT), he received the UofT Open Doctoral Fellowship. He was also a recipient of NSF CAREER Award from the National Science Foundation (NSF), Honda Initiation Award, and Alfred P. Sloan Research Fellow by the Sloan Foundation. In 2024, Qin received the 2024 Solid Modeling Pioneer Award. In 2025, Qin received the annual Tosiyasu Kunii Distinguished Researcher Award to recognize his contribution to shape modeling. Qin's research interests include geometric, shape, and solid modeling, graphics, physics-based modeling and simulation, computer aided geometric design, human–computer interaction, visualization, and scientific computing. Qin has published more than 450 papers in the top-tier international journals and conferences, and a very small subset of his earlier Shape Modeling International (SMI) papers are highlighted here to showcase his heavy involvement with the SMI research community since 1995. These research results span across many important and interesting research sub-areas, covering the topics of Hierarchical D-NURBS [11], automatic knot selection and determination of NURBS curves/surfaces [12], dynamic implicit solids enabling haptic sculpting [13], novel volumetric subdivision schemes supporting interpolation over arbitrary simplicial complexes [14], the design of a haptic, stereoscopic virtual environment [15], a formal description and introduction of rational spherical splines for genus-zero shape modeling [16], a new curve definition and metric description supporting surface comparison [17], the general feature descriptor based on shape distribution which enables rigorous and robust shape matching and shape analysis [18], and generalized PolyCube trivariate splines [19]. More detailed information about Dr. Hong Qin can be found from his website: https://www.cs.stonybrook.edu/qin. He can be reached at qin@cs.stonybrook.edu, or qin@cs.sunysb.edu (see Fig. 16).

3.1. Hong Qin interview

Question: What is your current research field?

Answer: In a much broader sense, I am interested in the general area of visual computing, covering but not just limited to 3D graphics, geometry and shape modeling, CAD, CAGD, data visualization, computational vision, medical imaging and analysis, and virtual environment. In a narrower sense, our research community typically label me as a "modeling person" where both geometry and physics are most relevant as far as the underlying theories and techniques are concerned. Shape modeling is most definitely within the core of my research fields.

Question: Where did you complete your formal education?

Answer: I received my BS and MS degrees from Peking University (the best university in China) in 1986 and 1989 respectively. I received my Ph.D. degree from University of Toronto in 1995. All are in Computer Science.

Question: What was your first job?

Answer: Immediately after I defended my MS thesis and graduated from Peking University, I took a research position at North China Computing Institute (located in Beijing). However, my stay at North China Computing Institute only lasted less than one year, because I knew back in 1989 that my long-term career goal is to pursue a doctoral degree overseas where I could first learn broader and in-depth knowledge that would continue to advance my professional career to the next higher level, so I left China in the summer of 1990 to pursue my PhD dream.

Question: What was your first publication?

Answer: my first publication essentially documented my MS thesis. This journal publication was jointly authored by me and my MS advisor, Professor Gongben Wang. Its citation is as follows: "The Program and Algorithm for Optimal Biological Sequence Alignment", Hong Qin and Gongben Wang, Acta Scientiarum Naturalium Universitatis Pekinensis, 27(1): 51-60, January 1991. Nevertheless, I do not believe that it had ever appeared in either DBLP or Google Scholar, because back in the 80's and earlier 90's, most of these famous scientific journals inside China were not fully recognized by international research communities outside of China (see Fig. 17).

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

Answer: Prior to the official birth of Shape Modeling in 1997, the earlier conference was under a different name — ACM SIGGRAPH Workshop on Implicit Surfaces. Because of my strong interest in Geometric Modeling, CAD, and CAGD, I was immediately attracted to this conference and its subsequent expansion to Shape Modeling dated back in 1996- and 1997-time frame. In 1995, I started my first academic job at the University of Florida, suffice to say, both ACM SIGGRAPH Workshop in Implicit Surfaces and its subsequent expansion to a full-fledged Shape Modeling International Conference Series had profound professional and research impacts on my earlier career development, as my career development very well synchronizes with the rapid growth of Shape Modeling Research Community since mid-1990's. I feel lucky that both my own career development and most of my Ph.D. advisees benefit from the tremendous expansion of Shape Modeling and its conference series. In 2001, I went to Genoa to attend SMI, and I recall that it was my very first exposure to SMI conference series, almost 25 years ago!

Question: What is your favorite memory of an SMI conference and when was your first? In 2001, I went to Genoa where SMI2001 was held. That was my first-time visit in Italy. I was so impressed

Fig. 17. Hong Qin at SMI 2006 during the conference excursion with his then-Ph.D. student Xin Li (Hong Qin: fourth from the left in the second row; Xin Li: third from the left in the third row).

Fig. 18. Hong Qin and one of his former Ph.D. students Ye Duan, currently Professor of Computer Science at Clemson University (at Charleston) and Program Manager at NSF/CISE, Professor Ye Duan was invited to serve as an external examiner at a PhD defense in Stony Brook in August 2024.

by Bianca's institute and the entire conference. The conference organization under Bianca's leadership was excellent. We had two paper presentations at SMI2001, and everything was impressive as far as SMI2001 goes, still remembering the technical sessions and all the social events.

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

Answer: My research advisors during both my MS and my PhD studies are tremendous. My MS advisor at Peking University was Professor Gongben Wang (he passed away 15 years ago sadly), while in Beida (Peking University), he taught me how to gain all the positive life experiences, especially how you would conduct yourself as a role model and career scientists. The biggest assets that I have acquired from Professor Wang back in my Beida years are how we should conduct ourselves as ordinary citizens and technical professionals. These had laid a sound foundation for me to grow up as a professor and scientist. At the PhD level, Professor Demetri Terzopoulos (currently he is at UCLA) was the most influential figure whom I admired the most, not surprisingly, I was lucky to have Professor Demetri Terzopoulos as my PhD advisor. My research and professional strength essentially all came from his insightful guidance and his diligent attitude to approach daily routines and tasks. The levels of his research aptitudes and his technical communication skillsets (both oral and writing) are out of this world. To date, I still feel that I have a long way to go based on the high standards he ever set. Very very few inside Computer Science research community could ever reach his professional realm. He is a true professional, scientist, mentor, who truly cares about his students. He goes all the way to help them at different stages of their career (from junior to senior) in the last 40 years, most definitely including myself. Right now, I still seek professional advice from him whenever I need him (see Fig. 18).

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

Answer: Professionally speaking, as a teacher and a professor, my proudest moment always links to the time when my students successfully defend their theses. Seeing them graduate from my department under my supervision and pursuing their own career is such a wonderful moment that could not be simply described by any kind of language. Each PhD graduate would go through our own hooding ceremony (here at SUNY Stony Brook), when advisors hood their own graduates, I would say that our hooding ceremony is among my proudest moments, it manifests that choosing an academic career is the right thing to do for me, and this year is the 30 th anniversary for my academic career!

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

Answer: I always feel much more fortunate that I had great mentors (when I was a student) and have so many great students (who grow up to become leaders in their respective fields). In the academic world alone, I have six former Ph.D. students who now hold senior academic ranks in different universities. In the last 30 years, the very reason that I could make an impact on SMI research communities is simply because they started to play significant roles in SMI and pertinent fields. I am lucky to have so many great students around (see Fig. 19).

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

Answer: I learned a lot from both my advisors and my students! Working hard with critical and creative thinking would allow you to make significant progress at the professional level each day, and this is far from easy. Another important aspect is, always know your goals both long term and short term, and what it would take for you to get there. Finally, in your daily life, always remember your advantages and strength, and never give up!

4. Young researcher award winner: Chiara Romanengo

Chiara Romanengo earned her PhD in Mathematics and Applications in 2023 and is currently a researcher at CNR-IMATI. Her research interests include curves and surfaces, shape analysis, algebraic geometry, and geometric modeling. She focuses on methods for identifying and recognizing characteristic parts of 3D model surfaces using the Hough transform technique [20,21]. Her scientific results have been published in several journals related to computer graphics, computational mathematics, and computer science. These approaches have been applied in various fields, including cultural heritage, CAD, and urban contexts. Additionally, her PhD thesis received the Best Thesis Award, "Matteo Dellepiane Award", at the "Smart Tools and Applications in Graphics 2024" conference.

Fig. 19. Chiara Romanengo.

Fig. 20. Chiara Romanengo receiving the best PhD thesis award at the "Smart Tools and Applications in Graphics 2024" conference.

4.1. Interview with Chiara Romanengo

Question: Where did you complete your formal education?

Answer: My education has a strong emphasis on mathematics, supplemented by skills in computer science and a focus on practical applications. I began my academic journey with a bachelor's degree in Mathematics from the University of Genoa. I then pursued a master's degree that directed my studies toward practical applications, culminating in a thesis at CNR-IMATI on Computer Graphics and Shape Modeling. Afterward, I continued my education with a Ph.D. program in Mathematics and Applications at the University of Genoa, which I completed in 2023 (see Fig. 20).

Question: What was your first publication?

Answer: My first publication is the paper titled "Recognizing Decorations in Archaeological Finds through the Analysis of Characteristic Curves on 3D Models" [22], co-authored with Silvia Biasotti and Bianca Falcidieno, and published in the journal "Pattern Recognition Letters". This paper presents the method I developed during my master's thesis for recognizing characteristic curves on 3D models and applies it to archaeological artifacts. Additionally, I obtained a conference paper during my master's thesis titled "SHREC'19 Track: Feature Curve Extraction on Triangle Meshes" [23]. This work discusses a challenge related to the automatic extraction of vertices on a mesh that collectively represent a feature curve. I participated in this challenge using the method developed during my master's thesis (see Fig. 21).

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

Answer: I first encountered Shape Modeling during my bachelor's degree when I took a course offered by two researchers from CNR-IMATI, specifically Silvia Biasotti and Giuseppe Patanè. This course focused on methods for analyzing discrete surfaces and their applications. It introduced the basic concepts and techniques of computational topology, which are essential for processing and extracting information from 3D models (see Fig. 22).

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

Answer: I began my research in Shape Modeling during my master's thesis in Mathematics, as I focused my coursework on a more applied approach. Since I wanted to develop a thesis on a more applied field, I reached out to Silvia Biasotti and Bianca Falcidieno at CNR-IMATI for potential topics. Among the various proposals, one that particularly interested me was a paper on recognizing characteristic curves in 3D models. For my thesis, I began studying a well-known recognition technique called the Hough transform, aiming to extend it from 2D to 3D, to identify space curves and surfaces in 3D models, including both meshes and point clouds.

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

Answer: Without a doubt, my research mentors are Silvia Biasotti and Bianca Falcidieno. Thanks to them, I have had the opportunity to approach this field with passion, determination, and enthusiasm. I began working with them on my master's thesis and have continued since then. I have learned everything I know from them. They enabled me to pursue my work through a Ph.D. and later with additional contracts at CNR-IMATI. They taught me how to navigate the world of research and shared their knowledge of my research topic. From the very beginning, they believed in me and continuously supported me.

I would also like to mention two individuals who have significantly influenced my research: Mauro Carlo Beltrametti and Michela Spagnuolo. Mauro Carlo Beltrametti was a professor at the University of Genoa and taught me everything I know about the Hough transform. Although he is no longer with us, I remember him fondly and am deeply grateful for his guidance. Michela Spagnuolo, the director of CNR-IMATI, has continuously supported me throughout my journey. She introduced me to a fascinating new realm of applications within the urban context, which I am becoming increasingly passionate about.

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

Answer: The moment I am most proud of is when I received the Best Thesis Award "Matteo Dellepiane Award", at the "Smart Tools and Applications in Graphics 2024" conference. This recognition highlights the value of my thesis work within the scientific community, and I am truly honored by it. Additionally, I am also deeply proud to receive this "SMI award", and I extend my gratitude for this significant acknowledgment within the scientific community.

5. Young investigator award winner: Guillaume Cordonnier

Guillaume Cordonnier is a Research Scientist in the Graphdeco group at the Inria Center at Université Côte d'Azur. He received his PhD in Computer Science from Université Grenoble Alpes under the supervision of Marie-Paule Cani and Eric Galin, and later held a postdoctoral fellowship at ETH Zurich. Since joining Inria in 2021, he has been leading research on the simulation of natural phenomena, at the intersection of computer graphics, physical simulation, and geosciences, with a strong focus on combining physical realism with expressive user control. His contributions include machine learning approaches to accelerate and control physical simulation [24], as well as new models for landscape and terrains [25–27], where he aims to develop a new paradigm for physics-based modeling of large-scale natural scenes. He leads the ANR InvTerra research project (2022–2026) and the Inria exploratory project NeuralGeoFlow (2025–2028). He serves on the program committees of Eurographics, Pacific Graphics, Computer Animation and Social Agents, and the Symposium on Geometry Processing. He is part of the scientific board of the French working group on Graphics, Geometry, Virtual reality, and visualization, where he chairs a PhD award committee (see Fig. 23).

Fig. 21. Chiara Romanengo with her master's thesis supervisors Bianca Falcidieno, Silvia Biasotti, and Mauro Carlo Beltrametti.

Fig. 22. Chiara Romanengo with Silvia Biasotti.

Fig. 23. Two portraits of Young Investigator Award Winner Guillaume Cordonnier.

5.1. Interview with Guillaume Cordonnier

Question: Where did you complete your formal education?

Answer: I completed my undergraduate and graduate studies in France. I studied at Ecole Normale Supérieure in Lyon, where I learned the foundations of computer science. I specialized in graphics/vision/robotics during my Master's degree at the Polytechnic National Institute (INP) of Grenoble. This year in Grenoble was an important step toward my decision to pursue a PhD. I followed existing Graphics courses with Georges-Pierre Bonneau, Nicolas Holzschuch, and Remi Ronfard, which confirmed my growing interest in Graphics. I also get to meet Marie-Paule Cani and Bedrich Benes, who supervised my Master's internship and deepened my interest in research. Marie-Paule then became my PhD supervisor. I also appreciated the mountainous landscape surrounding Grenoble, which influenced my PhD topic. All of that led to the beginning of my career as a researcher, with a Ph.D. at Inria and Université Grenoble Alpes and supervised by Marie-Paule Cani and Eric Galin, where I worked on the generation of large-scale landscapes (see Fig. 24).

Question: What was your first publication?

Answer: My first publication was a paper presented at Eurographics 2016 [28], which we wrote at the very beginning of my Ph.D. The idea actually originated during my Master's internship, which focused on terrain modeling. Our idea was to mimic the natural formation of mountain ranges to construct believable mountains at large scale. To gain deeper insight, I reached out to geologists, who explained that terrains evolve through the combination of tectonic uplift and water erosion. This process is well documented in the geomorphology literature and explained with simple physical laws. I realized these

Fig. 24. Guillaume Cordonnier with George Drettakis and Adrien Bousseau, his colleagues at Inria.

equations were perfectly suited for large-scale terrain generation in computer graphics. This was the base of the project, where I introduced a fast simulation model that solves these laws over geological times to generate large-scale landscapes. This started a series of research on both tectonically driven mountain generation [25] and large-scale water flow estimation [27], and still-ongoing collaborations with Earth and environmental sciences as I experienced that the more interesting ideas and research problem comes from these interdisciplinary interactions (see Fig. 25).

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

Answer: My first experience with shape modeling was during my first Master's internship, where I worked on a three-month project at the University of Calgary with Usman Alim and Faramarz Samavati. The project focused on sketch-based skull reconstruction from radiographic imagery. This project was also in collaboration with a medical doctor who wanted to use this sketch-based interface as a communication tool to explain swallowing conditions related to jaw positioning to patients. This experience confirmed my interest in computer graphics and shape modeling. Even though I did not continue working on medical applications, I appreciated developing shape modeling algorithms for other scientific fields, which was one of the drivers of my subsequent collaborations in Earth sciences (see Fig. 26).

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

Answer: Shape modeling has been part of my research since my PhD, where my work focused on the generation of realistic landscapes, with large-scale terrains [28], ecosystems [26], snow [29], glaciers [24], etc. One specificity of my work is that it lies at the interface of geometry and physical simulation. One of my research goals is to generate 3D shapes as the result of a physical process, e.g., mountain ranges result from the interplay of tectonics and erosion at geological timescales. The complementary approach is the use of geometric tools as efficient solutions to physical systems, especially with equilibrium or quasi-static approximations, for instance, to model rivers or glaciers.

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

Answer: Many interactions — too many to list here — have been invaluable in shaping my research career. Some mentors have had a particular long-standing influence. My Ph.D. supervisor, Marie-Paule Cani, provided me with numerous academic advices and opportunities well beyond my doctoral years, and transmitted me her open and inclusive vision of research. Furthermore, she has always been attentive to introducing me to a strong network of collaborators. Several of these collaborators have been instrumental in shaping my career: Eric Galin (also my PhD co-supervisor), Bedrich Benes, and James Gain have shared their knowledge and passion for natural phenomena. Jean Braun has introduced me to the geomorphology community, and his passion for research and natural sciences is a strong inspiration. I learned a lot from Markus Gross and Barbara Solenthaler during my postdoc at ETH. I have also greatly benefited from the mentorship of my colleagues at Inria, George Drettakis and Adrien Bousseau. I gain valuable insights from their experience and very much enjoy working in the inspiring research environment they helped create.

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

Answer: There are several proud moments in a career: getting a researcher position at Inria, seeing students succeed, receiving recognition through grants or invited talks, and, of course, receiving the SMI Young Investigator Award. In terms of research results, one moment I can think about is when I found a fast algorithm for the erosion of mountains by glaciers [24,30]. This is a complicated problem that spans different non-linear physical models at different scales. We developed a solution with a glaciologist, Guillaume Jouvet, based on a coupling of physics and machine learning, that can significantly accelerate computations for ice flow modeling and open new research directions in geology and glaciology. As a side note, I am not only proud of this result because of the potential outreach, but also because I finally solved a problem that had eluded me for years.

6. Service award winner: Yang Liu

Yang Liu is a Principal Researcher at Microsoft Research Asia, where he has been a member of the Spatial Intelligence group (formerly the Internet Graphics group) since 2010. He received his Bachelor's and Master's degrees in Computational Mathematics from the University of Science and Technology of China, and earned his Ph.D. in Computer Science from the University of Hong Kong. He later spent two enriching years as a postdoctoral researcher at Loria/Inria in France. Dr. Liu's research spans a wide range of topics in computer graphics and geometric computing, including meshing algorithms [31–36], architectural geometry [37–39], sketch-based modeling [40–42], shape reconstruction and parameterization [43–45], learning-based shape analysis and generation [46–49]. He has published extensively in leading venues such as ACM TOG, IEEE TVCG, and ACM SIGGRAPH/ACM SIGGRAPH Asia, with more than 85 publications to date. He has served on the SMI Steering Committee and played key roles in organizing SMI conferences, including Technical Paper Co-Chair (2021), Conference Co-Chair (2022), and Communication Co-Chair (2023–2025). He also contributed to the GMP conference series as Program Co-Chair in 2019 and Conference Co-Chair in 2025. In addition, he served as an Associate Editor for leading journals such as *ACM TOG* (2021–2024), *IEEE TVCG* (2019–2023), and *IEEE CG&A* (2023–present) (see Fig. 27).

6.1. Interview with Yang Liu

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

Answer: I'm a Principal Researcher specializing in geometry modeling, processing, and, more recently, 3D learning. Since joining Microsoft Research Asia in 2010, my early work focused on meshing, parameterization, and geometric modeling. Later, under the encouragement of my manager, Dr. Xin Tong, I transitioned into 3D learning, where I began exploring methodologies from computer vision and other adjacent fields. This shift not only expanded my technical toolkit but also reshaped my research directions and approach to problem-solving. I've been conducting research for over two decades, and throughout this journey, I've had the privilege of collaborating with many talented colleagues and intern students. These collaborations have been deeply enriching and have continually broadened my academic horizons.

Question: Where did you complete your formal education?

Answer: I completed my undergraduate and master's degrees in Mathematics at the University of Science and Technology of China, where I first encountered computer graphics through topics like rational surface implicitization and conic separation. That early exposure — especially learning spline theory and experimenting with OpenGL — sparked my interest in visual computing and shape modeling. I went on to pursue my PhD at the University of Hong Kong in 2003, focusing on geometry modeling and processing, including curve and surface fitting, architectural geometry, and meshing algorithms. I also had the opportunity to visit Prof. Helmut Pottmann's group in Vienna twice as a visiting

Fig. 25. Guillaume Cordonnier (left) after his PhD defense (from left to right, Pierre Poulin, Marie-Paule Cani, François Sillion, Eric Galin, Jean Braun, and Jean-Michel Dischler.

Fig. 26. Guillaume Cordonnier with his colleagues (Graphdeco group, Inria).

Fig. 27. Yang Liu during SMI 2005 on the MIT campus.

Fig. 28. Yang Liu at SIGGRAPH 2006 in Los Angeles with his advisor, Wenping Wang, recipient of the 2023 Distinguished Researcher Award.

student — experiences that were both formative and inspiring. In fact, my first SIGGRAPH paper was advised by Helmut. During my graduate studies, I had the privilege of being mentored by Prof. Falai Chen, Prof. Wenping Wang, and Prof. Helmut Pottmann. Their guidance was instrumental in shaping both my academic development and research trajectory (see Fig. 28).

Question: What was your first job?

Answer: After completing my PhD at the University of Hong Kong, I wanted to deepen my research experience and broaden my academic horizons before pursuing a faculty position. I joined Dr. Bruno Lévy's group at Loria/Inria in France as a postdoctoral researcher. Working with Bruno and other outstanding colleagues — and living outside of China for the first time — was an incredibly enriching experience. During that time, I continued my research on Centroidal Voronoi Tessellation for mesh generation. I still vividly remember coding CVT algorithms with Bruno, accompanied by the cheerful rhythm of keystrokes from his desktop — a small but lasting memory that captured the spirit of collaboration and creativity. That period was also personally meaningful, as my son was born in France, making the experience even more memorable. After two years, I returned to China and joined Microsoft Research Asia in 2010.

Question: What was your first publication?

Answer: My first publication was written in Chinese during my Master's studies at the University of Science and Technology of China. The paper, titled *An Algebraic Condition for the Positional Relationship*

Fig. 29. Yang Liu receiving the Alexander Pasko Service Award at SMI 2025.

of an Ellipse and a Parabola (Hyperbola), was co-authored with my classmate and friend Liyong Shen — now a professor at the University of the Chinese Academy of Sciences — under the guidance of our advisor, Prof. Falai Chen. The work extended Prof. Wenping Wang's research on ellipsoid separation to 2D cases. I later published two more papers on the topic, and in 2003, I began my PhD under Prof. Wang's supervision.

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

Answer: My first international conference paper was accepted at SMI 2005, titled *Reconstructing B-spline Curves from Point Clouds — A Tangential Flow Approach Using Least Squares Minimization*. Attending SMI 2005 at MIT was not only my first international conference experience but also my first visit to the United States — a truly memorable milestone. I vividly recall the excitement of seeing my paper listed in the printed conference program and the thrill of presenting my work to a global audience. The experience was both exhilarating and nerve-wracking, marking the beginning of my journey into the international research community. At the time, I didn't yet know how to network and wasn't familiar with many of the prominent figures in our field. Looking back now, I'm amazed to see how many of the names in that conference program have become leading researchers, and how many of them I've come to know personally in the years that followed.

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

Answer: I was introduced to the SMI organization in 2021 when I served as Technical Paper Co-Chair. It was my second experience organizing an international conference, and it proved to be both challenging and rewarding. Due to the COVID-19 pandemic, the conference was held virtually, which brought unique challenges — especially around time zones and participant engagement — but also opened up opportunities to innovate and adapt. One idea I initiated was transforming the online short breaks into virtual roundtable discussions. Although the format didn't attract much engagement — *people genuinely needed a break* — I still see it as a valuable experiment in fostering interaction in a remote setting. Since 2021, I've continued to serve the SMI community in various capacities, offering suggestions and taking action where needed. As Communication Co-Chair from 2023 to the present, I've been responsible for managing the SMI websites, ensuring that information is accurate, up-to-date, and accessible to the community. I've also worked to improve communication among members and SMI organization. Recognizing the decline in paper submissions to SMI, I proposed a multi-deadline model to support year-round submissions. This initiative was well-received, reshaped by the SMI Steering Committee, and will be implemented by the C&G journal. Overall, my journey with SMI has been marked by continuous learning and a growing commitment to serving the shape modeling community (see Fig. 29).

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

Answer: My early research on Centroidal Voronoi Tessellation [31, 32] has had a lasting influence on mesh generation, introducing efficient algorithms that are now widely adopted. My work in architectural geometry [37] remains one of the most cited in the field and was selected as one of the Seminal Graphics SIGGRAPH Papers [50], underscoring its foundational role. More recently, my contributions to 3D learning [46–48] have introduced novel neural network architectures that have shaped subsequent research in 3D shape analysis and generation. Beyond publications, many of my long-term intern students have gone on to pursue successful careers in both academia and industry. Additionally, my involvement in conferences and journals has helped facilitate the exchange of ideas and supported ongoing progress within the research community.

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

Answer: First, work on problems that actually matter — ones that solve real needs. It's easy to get caught up in elegant ideas, but the most rewarding research often starts with a practical challenge. Second, don't stay in one lane. Some of the most exciting breakthroughs happen when you borrow ideas from other fields. That's where creativity really kicks in. And finally, stay flexible. Research evolves. The rise of AI isn't just about new tools — it's a shift in how we think. Be ready to adapt and embrace new directions.

CRediT authorship contribution statement

Bianca Falcidieno: Supervision, Writing – review & editing. **Ergun Akleman:** Conceptualization, Writing – original draft, Writing – review & editing. **Stefanie Hahmann:** Supervision, Writing – review & editing. **Jorg Peters:** Supervision, Writing – review & editing.

Declaration of competing interest

None.

Data availability

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

References

[1] Liu Y, Council SMI. The homepage for shape modeling international. 2020, https://smiconf.github.io/SMI/doc/bylaws.html.
[2] Liu Y, Council SMI. The bylaws for shape modeling international. 2020, https://smiconf.github.io/SMI/.
[3] Wozny MJ. Tosiyasu L. kunii, 1938–2020. IEEE Comput Graph Appl 2021;41(2):114–9.
[4] Wyvill B, Falcidieno B. A conversation with bianca falcidieno: SMI 2021 Tosiyasu Kunii achievement award winner. Comput Graph 2022;105:A4–8.
[5] Adzhiev V. In memoriam: Professor alexander pasko. Comput Graph 2022;109:A3–4.
[6] Wyvill G, McPheeters C, Wyvill B. Data structure for soft objects. Vis Comput 1986;2(4):227–34.
[7] Bloomenthal J, Bajaj C. Introduction to implicit surfaces. Morgan Kaufmann; 1997.
[8] Wyvill B, Guy A, Galin E. Extending the csg tree. warping, blending, and boolean operations in an implicit surface modeling system. Comput Graph Forum 1999;18(2):149–58.
[9] Bloomenthal J, Wyvill B. Interactive techniques for implicit modeling. ACM Siggraph Comput Graph 1990;24(2):109–16.
[10] Wyvill B, McPheeters C, Wyvill G. Animating soft objects. Vis Comput 1986;2(4):235–42.
[11] Zhang M, Qin H. Hierarchical D-NURBS surfaces and their physics-based sculpting. In: 2001 international conference on shape modeling and applications (SMI 2001), May 7-11, 2001, genoa, Italy, IEEE computer society 2001. IEEE; 2001, p. 257–66.
[12] Xie H, Qin H. Automatic knot determination of NURBS for interactive geometric design. In: 2001 international conference on shape modeling and applications (SMI 2001), May 7-11, 2001, genoa, Italy, IEEE computer society 2001. IEEE; 2001, p. 267–77.

[13] Hua J, Qin H. Dynamic implicit solids with constraints for haptic sculpting. In: 2002 international conference on shape modeling and applications (SMI 2002), May 17-22, 2002, banff, alberta, Canada, IEEE computer society 2002. IEEE; 2002, p. 119–28, 274.
[14] Chang Y-S, McDonnell KT, Qin H. An interpolatory subdivision for volumetric models over simplicial complexes. In: 2003 international conference on shape modeling and applications (SMI 2003), May 12-16, 2003, seoul, Korea, IEEE computer society 2003. IEEE; 2003, p. 143–52, 291.
[15] Hua J, Duan Y, Qin H. Design and manipulation of polygonal models in a haptic, stereoscopic virtual environment. In: 2005 international conference on shape modeling and applications (SMI 2005), June 15-17, 2005, cambridge, MA, USA, IEEE computer society 2005. IEEE; 2005, p. 146–55.
[16] He Y, Gu DX, Qin H. Rational spherical splines for genus zero shape modeling. In: 2005 international conference on shape modeling and applications (SMI 2005), June 15-17, 2005, cambridge, MA, USA, IEEE computer society 2005. IEEE; 2005, p. 820–91.
[17] Li X, He Y, Gu DX, Qin H. Curves-on-surface: A general shape comparison framework. In: 2006 international conference on shape modeling and applications (SMI 2006), June 14-16, 2006, matsushima, Japan, IEEE computer society 2006. IEEE; 2006.
[18] Liu Y, Zha H, Qin H. The generalized shape distributions for shape matching and analysis. In: 2006 international conference on shape modeling and applications (SMI 2006), June 14-16, 2006, matsushima, Japan, IEEE computer society 2006. IEEE; 2006.
[19] Li B, Li X, Wang K, Qin H. Generalized PolyCube trivariate splines. In: SMI 2010, shape modeling international conference, aix en provence, France, June 21-23, 2010, IEEE computer society 2010. IEEE; 2010, p. 261–5.
[20] Hough PVC. Method and means for recognizing complex patterns. 1962, US Patent 3, 069, 654.
[21] Beltrametti MC, Robbiano L. An algebraic approach to Hough transforms. J Algebra 2012;37:669–81.
[22] Romanengo C, Biasotti S, Falcidieno B. Recognising decorations in archaeological finds through the analysis of characteristic curves on 3D models. Pattern Recognit Lett 2020;131:405–12.
[23] Moscoso Thompson E, Arvanitis G, Moustakas K, Hoang-Xuan N, Nguyen ER, Tran M, Lejemble T, Barthe L, Mellado N, Romanengo C, Biasotti S, Falcidieno B. SHREC'19 track: Feature Curve Extraction on Triangle Meshes. In: 12th EG workshop 3D object retrieval 2019. Gênes, Italy; 2019, p. 1–8.
[24] Cordonnier G, Jouvet G, Peytavie A, Braun J, Cani M-P, Benes B, Galin E, Guérin E, Gain J. Forming terrains by glacial erosion. ACM Trans Graph 2023;42(4).
[25] Cordonnier G, Cani M-P, Benes B, Braun J, Galin E. Sculpting mountains: Interactive terrain modeling based on subsurface geology. IEEE Trans Vis Comput Graphics 2018;24(5):1756–69.
[26] Ecormier-Nocca P, Cordonnier G, Carrez P, Moigne A-M, Memari P, Benes B, Cani M-P. Authoring consistent landscapes with flora and fauna. ACM Trans Graph 2021;40(4).
[27] Jain A, Kerbl B, Gain J, Finley B, Cordonnier G. FastFlow: GPU acceleration of flow and depression routing for landscape simulation. Comput Graph Forum 2024;43(7):e15243.
[28] Cordonnier G, Braun J, Cani M-P, Benes B, Galin E, Peytavie A, Guerin E. Large scale terrain generation from tectonic uplift and fluvial erosion. Comput Graph Forum 2016;35(2):165–75.
[29] Cordonnier G, Ecormier P, Galin E, Gain J, Benes B, Cani M-P. Interactive generation of time-evolving, snow-covered landscapes with avalanches. Comput Graph Forum 2018;37(2):497–509.
[30] Jouvet G, Cordonnier G. Ice-flow model emulator based on physics-informed deep learning. J Glaciol 2023;69(278):1941–55.
[31] Liu Y, Wang W, Lévy B, Sun F, Yan D-M, Lu L, Yang C. On centroidal voronoi tessellation–energy smoothness and fast computation. ACM Trans Graph 2009;28(4):101:1–101:17.
[32] Lévy B, Liu Y. L_p centroidal voronoi tessellation and its applications. ACM Trans Graph 2010;29(4):119:1–119:11.
[33] Liu Y, Xu W, Wang J, Zhu L, Guo B, Chen F, Wang G. General planar quadrilateral mesh design using conjugate direction field. ACM Trans Graph 2011;30(6):1–10.
[34] Fu X-M, Liu Y, Snyder J, Guo B. Anisotropic simplicial meshing using local convex functions. ACM Trans Graph 2014;33(6):182:1–182:11.
[35] Fu X-M, Bai C-Y, Liu Y. Efficient volumetric PolyCube-map construction. Comput Graph Forum 2016;35(7):97–106.
[36] Guo H-X, Liu X, Yan D-M, Liu Y. Cut-enhanced polycube-maps for feature-aware all-hex meshing. ACM Trans Graph 2020;39(4):106:1–106:14.
[37] Liu Y, Pottmann H, Wallner J, Yang Y-L, Wang W. Geometric modeling with conical meshes and developable surfaces. ACM Trans Graph 2006;25(3):681–9.
[38] Pottmann H, Liu Y, Wallner J, Bobenko A, Wang W. Geometry of multi-layer freeform structures for architecture. ACM Trans Graph 2007;26(3):65–es.
[39] Liu Y, Pan H, Snyder J, Wang W, Guo B. Computing self-supporting surfaces by regular triangulation. ACM Trans Graph 2013;32(4):92:1–92:10.
[40] Pan H, Liu Y, Sheffer A, Vining N, Li C-J, Wang W. Flow aligned surfacing of curve networks. ACM Trans Graph 2015;34(4):127:1–127:10.
[41] Li C, Pan H, Liu Y, Tong X, Sheffer A, Wang W. BendSketch: modeling freeform surfaces through 2D sketching. ACM Trans Graph 2017;36(4):125:1–125:14.
[42] Li C, Pan H, Liu Y, Tong X, Sheffer A, Wang W. Robust flow-guided neural prediction for sketch-based freeform surface modeling. ACM Trans Graph 2018;37(6):238:1–238:12.
[43] Wang W, Pottmann H, Liu Y. Fitting B-spline curves to point clouds by curvature-based squared distance minimization. ACM Trans Graph 2006;25(2):214–38.
[44] Fu X-M, Liu Y, Guo B. Computing locally injective mappings by advanced MIPS. ACM Trans Graph 2015;34(4):71:1–71:12.
[45] Fu X-M, Liu Y. Computing inversion-free mappings by simplex assembly. ACM Trans Graph 2016;35(6):216:1–216:12.
[46] Wang P-S, Liu Y, Guo Y-X, Sun C-Y, Tong X. O-CNN: octree-based convolutional neural networks for 3D shape analysis. ACM Trans Graph 2017;36(4):72:1–72:11.
[47] Wang P-S, Sun C-Y, Liu Y, Tong X. Adaptive O-CNN: a patch-based deep representation of 3D shapes. ACM Trans Graph 2018;37(6):217:1–71:11.
[48] Zheng X-Y, Pan H, Wang P-S, Tong X, Liu Y, Shum H-Y. Locally attentional SDF diffusion for controllable 3d shape generation. ACM Trans Graph 2023;42(4):1–13.
[49] Yang Y-Q, Guo Y-X, Xiong J-Y, Liu Y, Pan H, Wang P-S, Tong X, Guo B. Swin3D: A pretrained transformer backbone for 3D indoor scene understanding. Comput Vis Media 2025;11(1):83–101.
[50] Whitton MC, editor. In: Seminal graphics papers: pushing the boundaries, volume 2, 1st ed.. Vol. 2, New York, NY, USA: Association for Computing Machinery; 2023.