

Brief photographic history of the SPIE medical imaging meetings

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Abstract. To celebrate the 50th anniversary of the SPIE Medical Imaging meetings, I present photographs taken over the last three decades, selected with the goal of highlighting the enthusiasm and energy of the participants, which has led to the ongoing success of these meetings. Links are given to access complete albums for individual meetings. © 2022 *Society of Photo-Optical Instrumentation Engineers (SPIE)* [DOI: [10.1117/1.JMI.9.S1.012204](https://doi.org/10.1117/1.JMI.9.S1.012204)]

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1 Introduction

Conferences play a vital role in science; by bringing scientists together to interact and share their ideas, they significantly advance science. The SPIE Medical Imaging (MI) meetings are recognized as one of the premier international conferences for presenting and learning about advances in medical-imaging research.

SPIE MI conferences are devoted to the exchange of ideas about the technical foundations of medical imaging. They are designed to bring together scientists and engineers from academia and industry with the goal of facilitating the exchange of information in a congenial atmosphere. With the photographs here, I hope to provide a sense of the excitement and passion the attendees bring to the MI meetings, which has made them such a success.

In celebration of the 50th anniversary of the SPIE MI meetings, this paper presents a brief overview of those meetings by way of photographs. Only a small percentage of the MI photographs available in my Google Photo albums¹ can be shown here. Links to albums for individual meetings can be found in the [Appendix](#) at the end of this article, and a slideshow that displayed at the 50th anniversary SPIE MI is available at <https://bcove.video/3i8u6zJ>. Except for a few pictures from the 1990s, the photographs mostly cover the period from 2008 to 2018, which by no coincidence corresponds to when I bought my first digital single-lens reflex (SLR) camera to when I stopped attending the MI symposium. All photographs here were taken by me, unless otherwise noted.

This paper is organized according to the various elements of the meetings.

2 Venues

The SPIE MI series started in Chicago in 1972 as a small meeting with fewer than 100 participants as the inspiration of Bill Hendee under the name Application of Optical Instrumentation in Medicine I.² It continued as an annual meeting, held in a variety of places, such as Kansas City, Atlanta, Toronto, San Francisco, and New Orleans.

In 1985 the meeting landed at the Marriott Hotel in Newport Beach, California. Situated on a hilltop overlooking the Pacific Ocean, the venue seemed ideal and met with enthusiastic approval. The Newport Beach meeting became a favorite among scientists and engineers working in medical imaging, and not just because it was a balmy retreat from dreary February weather elsewhere; it featured congenial interactions with top researchers in the imaging field and kept them abreast of the latest developments. Unfortunately, I don't have many photographs from those early meetings, but the sunset in [Fig. 1](#) clearly illustrates the allure of the Newport Beach venue.

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Fig. 1 Sunset from the Marriott Hotel in Newport Beach, California, site of the MI conference from 1985 to 1997.



Fig. 2 Swimming pool and high-rise at the Town and Country convention center, San Diego, California, site of the MI conference from 1998 onward.

Eventually our small meeting grew too big for the Newport Beach Marriott. In 1998 SPIE MI moved to the Town and Country Convention Center in San Diego (Fig. 2), which proved to be an excellent venue for our conference. In 2009 the MI meetings started convening every other year at a Disney facility called Lake Buena Vista in Orlando, Florida (Fig. 3), in large part to help reduce travel costs for many participants who came from the eastern United States or Europe. The MI Symposium moved in 2018 to the Marriott Marquis Houston facility as the alternating venue, instead of Lake Buena Vista.

From the small meeting in 1972, the SPIE MI series has grown to a five-day-long full-sized symposium consisting of nine separate conferences with up to seven parallel tracks or sessions and more than 1100 attendees. From the original topics of physics and image processing, the conferences now include human perception, ultrasound, computer-aided diagnostics, informatics, image-guided procedures and pathology, sometimes forcing attendees to make painful choices about which sessions they will attend.



Fig. 3 The MI conferences started meeting every other year at the Lake Buena Vista facility in Orlando, Florida, in 2009. Photo by Wolfgang Fenz.

3 Scientific Presentations

Oral presentations by the attendees are at the core of the MI program as they give imaging scientists and engineers a chance to share their cutting-edge research. The oral presentations are selected by the Program Committees of each conference from proposals submitted by researchers. Although they are allotted 20 minutes on the program, speakers are supposed to leave several minutes at the end of their talk to allow questions or comments from the audience. Nearly every presentation provokes pointed questions, which encourages the exchange of scientific ideas. Figures 4–10 show some of the outstanding speakers at various conferences over the years.

4 Poster Sessions

The poster sessions consist mostly of poster presentations but also can include live demonstrations and at times, exhibits hosted by manufacturers.



Fig. 4 Martin Styner giving his talk in the Image Processing Conference (2018).



Fig. 5 Nicole Ruiters presenting her paper in the Ultrasound Conference (2012).



Fig. 6 Chuck Mistretta presents his paper in the Physics Conference (2008). Chuck attended the second MI meeting in 1972.



Fig. 7 Mini Das presenting her paper in the Physics Conference (2015).



Fig. 8 Benoit Dawant poses a question to the speaker in his own enthusiastic style in the Image Processing Conference (2013).



Fig. 9 Timothy Szczykutowicz answers a question from audience in the Physics Conference (2013).



Fig. 10 Sandra Schultz answers a question from the audience in the Image Processing Conference (2018).

4.1 Posters

As MI attendance grew, the limited amount of time for oral presentations led to more poster presentations so everyone would be able to present their work. As it became evident that posters are an excellent way to communicate a researcher's new ideas and to engage with others, attendees embraced them. For many, it became their preferred form of presentation. When presenting a poster in a one-on-one situation, you can get direct feedback about your research from other attendees, much more so than with an oral presentation. The atmosphere in the poster sessions is stimulating and congenial, as seen in Figs. 11–14, often leading to ongoing professional relationships,

Hors d'oeuvres are often served at the poster sessions, which is fortuitous since these sessions take place rather late in the afternoon.

4.2 Live Demonstrations

As part of the poster sessions, the Computer Aided Diagnosis (CAD) conference holds live demonstrations, which allow systems and algorithms developers to show off their creations in real time. These demos are extremely popular, as seen in Figs. 15 and 16, and can lead to intense discussions.

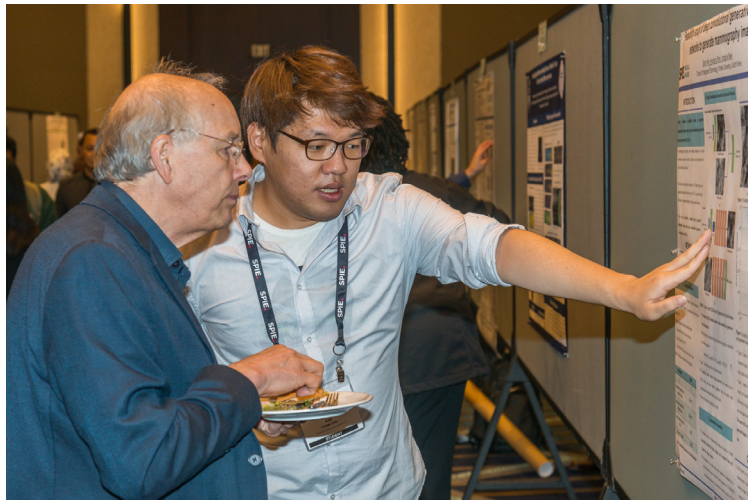


Fig. 11 Poster session: Gihun Kim presents his research to Nico Karssemeijer (2018).



Fig. 12 Poster session: Hala Bouazizi explaining her poster (2017).

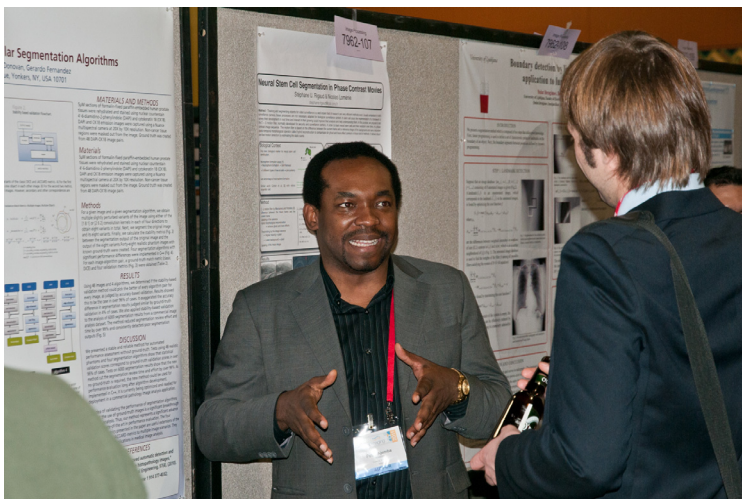


Fig. 13 Poster session: Peter Ajemba explains his poster (2011).

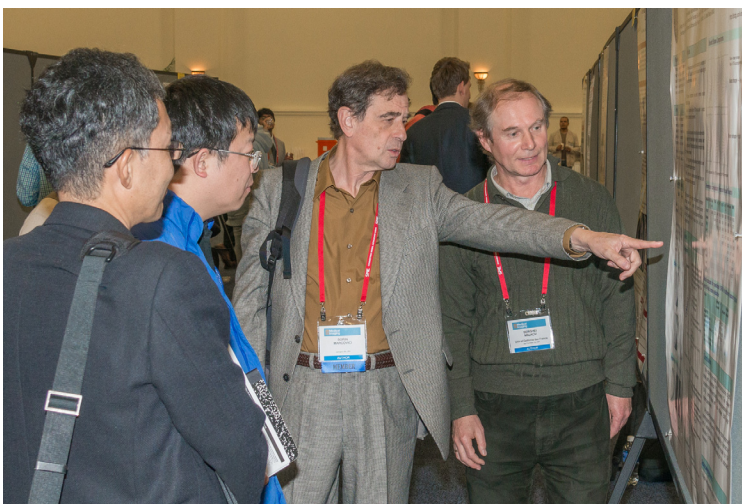


Fig. 14 Poster session: Sorin Marcovici presents his poster to Serghei Malkov and others (2014).



Fig. 15 CAD demonstration attracts a crowd (2008).



Fig. 16 CAD demonstration draws a lot of attention (2017).

4.3 Manufacturers' Exhibits

In the mid-80s and 90s, a sizable number of manufacturers of medical-imaging equipment exhibited their newest products at MI. They often set up their exhibits next to the poster sessions or in a nearby room. Their exhibits drew numerous attendees, eager to find out what new gadgets were available. Unfortunately, those exhibits have mostly fallen by the wayside. Figure 17 shows a recent exhibit.

5 Keynote Presentations

Each conference features a keynote speaker, for which the conference organizers choose a recognized expert in an exciting area they wish to emphasize. Keynote speakers are given most of an hour for their presentation, with ample time left for the audience to ask questions. These sessions are inspiring and frequently attended by people from other conferences. Figures 18–23 show some of the notable keynote speakers.



Fig. 17 Manufacturer exhibit: Nick Glover explains his company's optical CT scanner (2015).



Fig. 18 Terry Peters, an MI regular, giving his keynote talk on ultrasound guidance of cardiac interventions in the Ultrasound (US) Conference (2011).



Fig. 19 Mike Fitzpatrick, a regular MI attendee, presents his keynote paper on the history of error in target alignment in the Image Processing Conference (2015).



Fig. 20 Jerry Prince posing a question to the speaker, Brian Anthony, in the US Conference (2016).



Fig. 21 Brian Anthony, keynote speaker on prosthetic fitting using ultrasound in the US Conference, answers question from the audience (2016).



Fig. 22 Allan Johnson giving the keynote talk on IP pipeline in magnetic resonance histology in the US Conference (2016).

6 Plenary Session

The plenary session brings together all MI Symposium participants to honor the accomplishments of attendees and to hear a stimulating talk of wide interest.

6.1 Awards

The plenary session begins by honoring those who have received awards by SPIE or the Symposium.

For example, in the 2011 plenary session, Harry Barrett received SPIE's Gold Medal Award (Fig. 24), the highest honor the society bestows, for his outstanding work in advancing the



Fig. 23 Martin Stumpe gives the keynote talk on using deep learning to improve cancer diagnosis in the Pathology Conference (2018).



Fig. 24 Harry Barrett, receiving the prestigious SPIE Gold Medal award from SPIE Senior Director Andrew Brown (2011).

understanding of medical imaging, formulating rigorous approaches to the assessment and optimization of image quality and developing innovative photon imaging systems.

Also acknowledged at the beginning of the plenary session are the new SPIE Fellows associated with MI. For example, Fig. 25 shows Robert Nishikawa receiving his Fellow certificate in 2017. The winners of the R.F. Wagner Best Student Paper Award are also recognized, as seen in Figs. 26 and 27. These awards are named in memory of Bob Wagner who attended most MI meetings, including the first one in 1972. Bob made significant contributions to the success of the Medical Imaging meetings and played a major role in the development of medical imaging, especially in the area of the assessment of image quality.



Fig. 25 Robert Nishikawa receiving his SPIE Fellow certificate from Berkman Sahiner (2017).



Fig. 26 Finalists for R.F. Wagner best student paper award (2017).



Fig. 27 Finalists for best student paper award (2010).

6.2 Plenary Presentations

The plenary presentation is one of the highlights of the symposium. The organizers pay particular attention to choosing a provocative topic for the plenary talk and picking a speaker who will provide a fresh and enlightening perspective; Figs. 28–31 show some of the recent memorable plenary speakers.

7 Workshops

When everyone should be going to dinner, attendees are treated to workshops, which can last until 7:45 PM. Fortunately, snacks and soft drinks are made available. A workshop involves a panel of experts, put together by conference organizers to stress a trending topic that will interest the conference. Each panel member briefly presents their views of the topic and then the discussion is opened up for questions and comments from the audience, which the panel members try to address. There is always lively audience participation and often differences of opinion among the participants. Figure 32 shows the panel assembled to discuss toolkits for deep learning during the workshop for the Image Processing conference in 2018.



Fig. 28 Greg Corrado, the plenary speaker in 2017 gives a talk on applying deep learning to medical imaging.

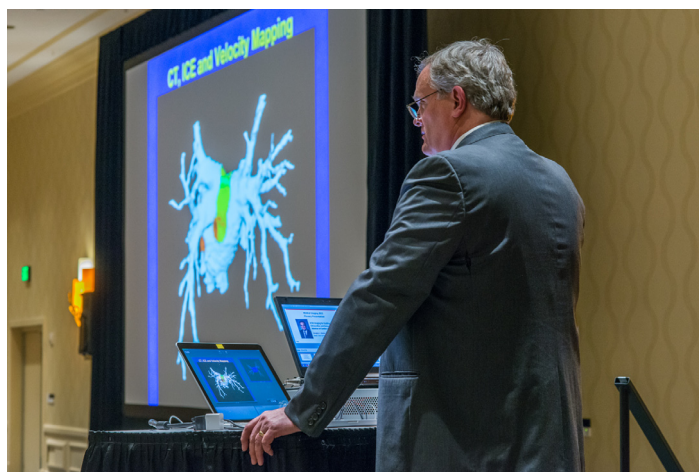


Fig. 29 Douglas Packer, the plenary speaker in 2015 talks about image-guided ablation of the heart.



Fig. 30 Bill Hendee, the organizer of the first conference in the Medical Imaging series in 1972, gives the plenary talk in 2011 on the expanding role of physics and engineering in medical imaging.



Fig. 31 Roderic Pettigrew, the plenary speaker in 2010 speaks on the role of biomedical imaging in advancing public health.



Fig. 32 The panel of experts assembled to discuss toolkits for programming in deep learning in the Image Processing workshop (2018).

8 Intermissions

Breaks in the program give participants a chance to recover from several hours of intense cerebral activity and obtain some refreshments, be they coffee or tea, or lunch. These breaks are extremely beneficial for networking.

8.1 Lunches

Lunches are provided at MI meetings as part of the registration fee. Seated around large tables, attendees find it natural to interact with others and talk about their research projects. Figures 33 and 34 show a few lunches. At the Newport Beach meetings, some physics and



Fig. 33 Lunch on the patio at the Town and Country Convention Center (2010).



Fig. 34 Lunch outdoors at Lake Buena Vista (2013).

imaging-processing attendees played hooky during the sessions featuring Picture Archiving and Communication Systems (PACS) and took advantage of a local beach to have lunch and continue discussions of their own research (Figs. 35 and 36).

8.2 Coffee Breaks

The twice daily coffee breaks provide a welcome respite from the regular program; they allow participants to refresh themselves, mingle and chat, as seen in Figs. 37 and 38.



Fig. 35 Lunch at Pelican Point beach, Bob Wagner and Art Burgess enjoying the sun while undoubtedly discussing Art's human-perception studies (1994).



Fig. 36 Lunch at Pelican Point, Mike Fitzpatrick in intense discussion with a colleague; Yves Bizet and Pierre Jannin in the background (1994).



Fig. 37 Coffee break (2017).



Fig. 38 Coffee breaks give everyone a chance to talk to old friends and make new ones (2018).

8.3 *Networking Events*

Special networking events give students the chance to engage experienced researchers. For example, Dessert with the Experts provides students an opportunity to interact with leading experts in medical imaging in a casual atmosphere and learn how they developed their careers, as seen in Figs. 39 and 40. One of these types of events is the Women's Networking Lunch.

9 *Courses*

In recent years SPIE MI has offered around nine courses. These are half-day or full-day classes on basic tools of medical imaging that many attendees find worthwhile for learning something



Fig. 39 The Dessert with the Experts event gives students a chance to get career advice from experienced researchers (2010).



Fig. 40 Students' lunch with the experts (2015).

new and useful in their research. The benefits of live instruction include getting to ask questions and networking with the instructors; furthermore, SPIE courses relevant to medical imaging are also available online. Figures 41–43 show three MI courses in progress.

10 Logistics

The SPIE MI meetings run remarkably smoothly because of the considerable efforts made in part by the symposium and conference organizers, but most importantly by the SPIE staff. With superb professionalism they handle the registration of attendees before and at the meeting (Fig. 44), publish the symposium program, deal with hotel arrangements for meeting space, amenities and food service and arrange for travel and reimbursement for invited speakers.

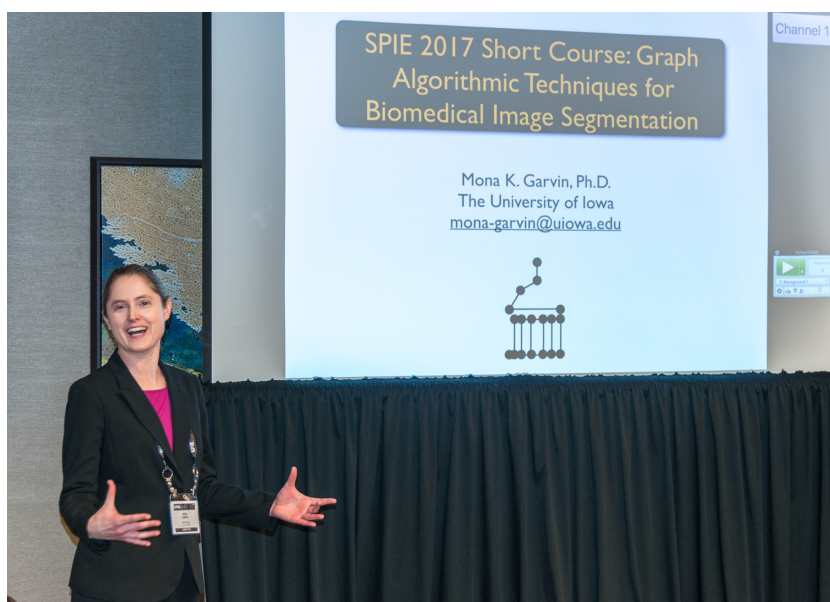


Fig. 41 Mona Garvin teaching her course on biomedical image segmentation (2017).

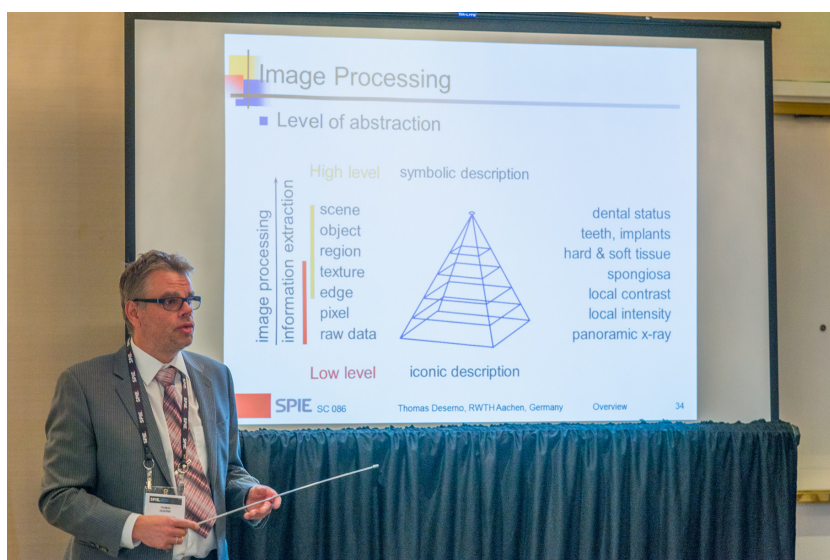


Fig. 42 Thomas Deserno teaching his course on Medical Image Processing (2016).

During the meeting, the SPIE staff keeps things running smoothly (Fig. 45), oversee meeting-room set up, keep track of presenters' slides and recently, record the speakers. The calm seen by the attendees belies the huge amount of work done behind the scenes by SPIE staff.

11 Summary

For the last 50 years, the SPIE Medical Imaging series of conferences has proven the value of and need for an annual meeting devoted to the scientific foundations of medical imaging. Many of the advancements made in medical-imaging techniques and equipment over that period were



Fig. 43 Hans Meine teaching his course on deep learning for image understanding (2018).



Fig. 44 And the meeting begins, Sunday at 7:50 AM; Sandy Hoeltherhoff and Diane Cline greeting attendees at the registration desk (2014).

discussed at these meetings in their early stages of development. Without a doubt, the high-quality of this series has played a significant role in the evolution of medical imaging in the clinic. With the photographs presented here, I have tried to convey the excitement and enthusiasm of the attendees, which leads to open communication of cutting-edge research, a hallmark of the SPIE MI meetings.



Fig. 45 Behind the registration desk, SPIE staffer Bonnie Peterson giving directions (2008).

12 Appendix: Photographs, Availability

A directory of links to my photographic albums on Google Photos for recent SPIE MI meetings can be found with the link in Ref. 1. Here are direct links to individual meetings:

Early meetings (1991–1994) <https://goo.gl/photos/PAsnZNA3YRGU4fL8>

SPIE MI 2008 <https://goo.gl/photos/89ywnDutLriyvm09>

SPIE MI 2009 <https://goo.gl/photos/gbDgmQDFumQA4S3z9>

SPIE MI 2010 <https://goo.gl/photos/jrGe92C7Tz9Q9zps6>

SPIE MI 2011 <https://goo.gl/photos/bcmnEkm5kfJXm9F58>

SPIE MI 2012 <https://goo.gl/photos/wLTDZitLStPsywBy9>

SPIE MI 2013 <https://goo.gl/photos/6GACY2gEyiNLtzc7>

SPIE MI 2014 <https://goo.gl/photos/NoUbcfGK2XHEzgHq5>

SPIE MI 2015 <https://goo.gl/photos/FiFohEaMMbDmNk7T7>

SPIE MI 2016 <https://goo.gl/photos/XUTjF1x1gfN2FKzi8>

SPIE MI 2017 <https://goo.gl/photos/aoLJCFLwCMgDA5af7>

SPIE MI 2018 <https://photos.app.goo.gl/n3w07Pdnv8YwmBA92>

Disclosures

No conflicts of interest, financial or otherwise, are declared by the authors.

Acknowledgments

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Kenneth M. Hanson retired in 2004 from the Los Alamos National Laboratory, where he was a senior scientist (staff member). He received his Bachelor of Science in Engineering Physics degree from Cornell University in 1963 and his MS and PhD in physics from Harvard University in 1967 and 1970, respectively. He has published more than 160 journal and proceedings papers, several book chapters and has edited numerous proceedings. His research areas included high-energy electron and photon experiments, proton CT, image quality assessment, image task performance, CT reconstruction from limited data, Bayesian analysis, characterization of posterior probability distributions, and validation of simulation codes. In regard to SPIE MI, Hanson served on the organizing committee for the Image Processing Conference (IP) for many years, was IP (co)chair from 1996 to 2001 and Symposium co-chair from 2002 to 2004. He also taught a short course on technical writing from 2006 to 2018 and was the “official photographer” for the Symposium from 2008 to 2018. In 2017 Hanson received two awards from SPIE: the Recognition of Outstanding Achievement Award and the prestigious SPIE Director’s Award. He is a fellow of SPIE, senior member of the American Physical Society, and senior member of IEEE.