2024 ACS SURGEONS AND ENGINEERS:

A Dialogue
on Surgical Simulation

PROGRAM BOOK

ACS / **Education**

American College of Surgeons

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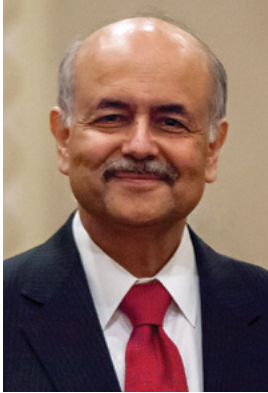
Welcome

On behalf of the American College of Surgeons (ACS) Division of Education, I would like to welcome you to the 2024 Annual Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting. Given the success of this meeting for the past 5 years, including the first in-person meeting last year after the pandemic, we are very pleased to offer another full-day, in-person event. This will permit us to fully explore synergies between engineers, surgeons, scientists, healthcare professionals, and educators, to advance simulation-based surgical education and the use of state-of-the-art simulations and simulators.

Mark S. Cohen, MD, FSSO, FACS, dean of the Carle Illinois College of Medicine, senior vice president at Carle Health, and professor of surgery and biomedical and translational sciences at the Carle Illinois College of Medicine, will deliver the Keynote Address, "Developing an Ecosystem of Innovation and Entrepreneurship to Advance the Future of Surgery and Academic Medicine." A Special Panel on how to build better surgical simulators will feature a surgeon educator, an academic engineer, and a simulator industry representative and continue the discussion that began at last year's meeting. The Panelists include John T. Paige, MD, FACS, professor of clinical surgery and director of wound care at Louisiana State University; Ganesh Sankaranarayanan, PhD, associate professor of surgery and biomedical engineering at The University of Texas Southwestern Medical Center; and Henry Lin, PhD, simulation learning architect at Intuitive Surgical.

From the high-quality abstracts received, the ACS Division of Education's Surgeons and Engineers Committee has selected 9 abstracts for podium presentations and 36 abstracts for poster presentations. 20 simulators/models will be interactively presented at the inaugural Do-It-Yourself (DIY) simulator/model competition.

On behalf of the ACS Division of Education and the Surgeons and Engineers Committee, thank you for attending this unique event. We look forward to continuing the productive dialogue we have initiated between surgeons and engineers to foster meaningful collaboration.

Ajit K. Sachdeva, MD, FACS, FRCSC, FSACME, MAMSE
Director, ACS Division of Education
Chair, ACS Program for Accreditation of Education Institutes

Welcome from Program Chairs

On behalf of the Program Committee and the Division of Education of the American College of Surgeons (ACS), we welcome you to the 2024 ACS Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting. The previous meetings received an overwhelming number of positive responses, so we are excited to offer a full day of activity as an in-person meeting at ACS Headquarters!

The agenda for this meeting is specifically designed to convey the exciting ideas and cutting-edge innovations of a unique collaborative community of surgeons, academic and industry engineers, scientists, and surgical education leaders. It is our hope that by attending this meeting, you will gain a better understanding of the multifaceted needs, challenges, and potential benefits that arise from this multidisciplinary partnership and enthusiastically contribute to promote the highest quality of surgical care through advanced knowledge and innovative education.

Through this collaboration, the Program Committee and the Division of Education have three essential goals: to bridge surgical and engineering communities, advance and support expertise and excellence in surgery, and enrich surgical simulation-based training with the most current dialogue on state-of-the-art technological and engineering advancements.

With these goals in mind, the Program Committee has planned a premier program to foster dialogue, enhance knowledge, build relationships, and spark ingenuity:

- **Keynote Address**—*Developing an Ecosystem of Innovation and Entrepreneurship to Advance the Future of Surgery and Academic Medicine,* Mark S. Cohen, MD, FSSO, FACS, University of Illinois Urbana-Champaign

- **Special Panel Discussion**—*How to Build Better Surgical Simulators*, a special panel of a surgeon educator, an academic engineer, and an industry engineer from the surgical industry

- **Oral and Poster Presentations**—Our oral and poster presentations will shed light on the multifaceted collaborations between surgeons and engineers working together in research.

- **DIY Simulator/Model Competition**—The meeting hosts its first DIY simulator/model competition with its aim of promoting the development of do-it-yourself simulators and models and encouraging the use of the simulators and models to improve simulation-based surgical education and training.

We are confident that you will find this meeting to be thought-provoking and rewarding, and we very much look forward to welcoming you to the meeting. After attending this meeting, please provide us with your feedback to help us to ensure the success of this and future meetings.

On behalf of the Program Committee, thank you for attending!

Gyusung Lee, PhD
Program Co-Chair
Assistant Director, Simulation-Based Surgical and Education Training, Division of Education
American College of Surgeons

Mandayam A. Srinivasan, PhD
Program Co-Chair
Founder, Laboratory for Human and Machine Haptics
Massachusetts Institute of Technology
Professor of Haptics, Computer Science Dept.
University College London, UK

Agenda

All times listed are Central Time. Agenda and speakers are subject to change. The views expressed by individual speakers are their own and do not necessarily reflect those of the American College of Surgeons.

Wednesday, March 13

Time	Event	Location
7:00–8:00 am	**Registration**	*Foyer*
8:00–8:15 am	**Welcoming Remarks** Ajit K. Sachdeva, MD, FACS, FRCSC, FSACME, MAMSE, *American College of Surgeons* Mandayam Srinivasan, PhD, *MIT and University College London, UK* Gyusung Lee, PhD, *American College of Surgeons*	*BOR Room*
8:15–9:15 am	**Keynote Address** *Developing an Ecosystem of Innovation and Entrepreneurship to Advance the Future of Surgery and Academic Medicine* Mark S. Cohen, MD, FSSO, FACS, *University of Illinois Urbana-Champaign*	*BOR Room*
9:15–10:25 am	**Special Panel: How to Build Better Surgical Simulators—Part 2** *Moderator:* Gladys Fernandez, MD, *Baystate Simulation Center* *Panelists:* *Surgeon Educator:* John T. Paige, MD, FACS, *Louisiana State University* *Academic Engineer:* Ganesh Sankaranarayanan, PhD, *The University of Texas Southwestern Medical Center* *Industry Engineer:* Henry Lin, PhD, *Intuitive Surgical*	*BOR Room*
10:25–10:40 am	**Morning Break and Exhibitor Visit**	*Foyer*
10:40–11:40 am	**Abstract Presentation 1**	*BOR Room*
11:40 am–12:30 pm	**DIY Simulator/Model Presentation 1**	*Foyer*
12:30–1:30 pm	**Lunch and Exhibitor Visit**	*Foyer & BOR Room*
1:30–2:15 pm	**DIY Simulator/Model Presentation 2**	*Foyer*
2:15–3:20 pm	**Poster Presentation**	*Various Designated Areas*
3:20–3:40pm	**Afternoon Break and Exhibitor Visit**	*Foyer*
3:40–4:25 pm	**Abstract Presentation 2**	*BOR Room*
4:25–4:35 pm	**DIY Competition Result Announcement**	*BOR Room*
4:35–4:45 pm	**Suggestions for the 2025 Meeting**	*BOR Room*
4:45–5:00 pm	**Closing** Ajit K. Sachdeva, MD, FACS, FRCSC, FSACME, MAMSE, *American College of Surgeons* Mandayam Srinivasan, PhD, *MIT and University College London, UK* Gyusung Lee, PhD, *American College of Surgeons*	*BOR Room*
5:00–6:00 pm	**Reception**	*Foyer*

Please note: The 2024 ACS Surgical Simulation Summit is March 14–15 at the nearby Swissôtel.

Program Chairs

Gyusung I. Lee, PhD

Assistant Director, *Simulation-Based Surgical Education and Training, American College of Surgeons Division of Education*

Gyusung Lee, PhD is the Assistant Director of Simulation-Based Surgical Education and Training in the Division of Education at American College of Surgeons. Dr. Lee obtained his training in academic laboratories as well as in clinical environments. Throughout his career, he has performed sponsored research studies both independently and within teams and championed the development and execution of various surgical education programs.

Dr. Lee completed his graduate studies in Biomechanics and obtained MS and PhD degrees in the Department of Biomedical Engineering at Texas A&M University in 1996 and 2002. His dissertation research was an investigation of the mechanism of secondary injuries. After graduation, he completed his postdoctoral training in the motor control laboratory at Arizona State University, where he researched how joint coordination and control strategies are affected by the aging process and by Parkinson disease. After his 2 years of postdoctoral training, Dr. Lee joined the Department of Surgery at the University of Maryland, School of Medicine (UMSOM) as a faculty research associate. His primary research interest at the UMSOM was to investigate the physical and cognitive ergonomics associated with various minimally invasive surgeries (MIS), including traditional laparoscopy, Natural Orifice Transluminal Endoscopic Surgery (NOTES), and robotic surgery.

Dr. Lee then served as the director of Robotic Education and Ergonomics Research at the Minimally Invasive Surgical Training & Innovation Center

(MISTIC) in the Department of Surgery at Johns Hopkins School of Medicine. One of his primary responsibilities in MISTIC was to develop the comprehensive robotic surgery training curriculum. This program provided surgical trainees with basic robotic skill training in preparation for the Fundamentals of Robotic Surgery (FRS), and advanced skill training for the immediate application of the learned skills in the trainees' actual case involvement. Using this curriculum, Dr. Lee offered robotic training to Hopkins residents, fellows and attending surgeons, from the specialties of general surgery, gynecology, surgical oncology, urology, and cardiac surgery. In addition, he also created a didactic and hands-on training program for OR staff members assisting robotic surgery cases. Through this program, Hopkins OR staff members receive skills training on a regular basis for establishing better teamwork between surgeons and OR staff members.

As the Assistant Director of Simulation-Based Surgical Education and Training, Dr. Lee provides leadership for a broad range of innovative simulation-based education and training programs from the Division of Education. He is responsible for designing simulation-based programs, providing leadership for the simulation research and development activities, especially those of the Consortium of ACS Accredited Education Institutes, and building and strengthening collaborative relationships with national organizations and the federal government, including the Department of Defense.

Mandayam A. Srinivasan, PhD

Founder, Laboratory for Human and Machine Haptics, *Massachusetts Institute of Technology; Professor of Haptics, Computer Science Department, University College London, UK*

Prof. Mandayam A. Srinivasan is the founder of the laboratory for human and machine haptics at the Massachusetts Institute of Technology and holds the professorial chair of haptics at the Department of Computer Science, University College London, UK. He is also Vajra faculty at the Indian Institute of Technology Madras, India. He received a bachelor's degree in civil engineering from Bangalore University, a master's degree in aeronautical engineering from the Indian Institute of Science, and a PhD. degree in mechanical engineering from Yale University. Following postdoctoral research at the Department of Anesthesiology, Yale University School of Medicine, he moved to MIT and founded the Laboratory for Human and Machine Haptics, known worldwide as the MIT Touch Lab.

Professor Srinivasan's research over the past 3 decades on the science and technology underlying information acquisition and object manipulation through touch has played a pivotal role in establishing the multidisciplinary field of modern haptics. He has been recognized worldwide as an authority on computation, cognition, and communication through touch interactions in humans and modern machines such as computers and robots. His pioneering scientific investigations of human haptics involving biomechanics, neuroscience, and psychophysics have led to significant advances in our understanding of how nerve endings in the skin enable the brain to perceive the shape, texture, and softness of objects. His work on machine and computer haptics involving design and development of novel robotic devices, mathematical algorithms and real-time control software has enabled touching, feeling, and manipulating objects that exist only virtually as programs in the computer. He has also demonstrated novel haptic applications such as virtual reality-based simulators for medical training, real-time touch interactions between people across continents and direct control of robots from brain neural signals. More recently, he has been working on developing haptic aids for blind people, smartphone-based healthcare for underserved populations, novel robotic fingertips, and teleoperation systems for micro-/nanomanipulation capable of performing surgery on a single cell with micron precision.

The international impact of Professor Srinivasan's work has been multifaceted. He has led American and European multidisciplinary teams in a number of cutting-edge technology research projects. He has authored more than 230 publications in multiple fields ranging from neuroscience to robotics that include some of the most highly cited papers on haptics. He has given more than 130 invited talks all over the world, with many keynote or plenary talks in premier international conferences. Professor Srinivasan's work has attained broader social impact as well; he has been featured or quoted in print media such as *Scientific American, Time Magazine, The Wall Street Journal, The New York Times, Times of India, Pravda*, and the *Smithsonian Magazine*, as well as by worldwide radio and TV networks such as the BBC and CNN in programs focused on cutting-edge research in information technology and its future prospects. Several of the technologies that were developed in his lab have been displayed as hands-on interactive exhibits in many museums such as the Boston Museum of Science, MIT Museum, and the V&A Museum in London.

KEYNOTE SPEAKER

Mark S. Cohen, MD, FSSO, FACS

University of Illinois Urbana-Champaign

Mark S. Cohen, MD, FSSO, FACS, will give the Keynote Presentation, "Developing an Ecosystem of Innovation and Entrepreneurship to Advance the Future of Surgery and Academic Medicine." He is the dean of the Carle Illinois College of Medicine and senior vice president and chief academic officer for Carle Health. He is a practicing surgical oncologist and endocrine surgeon and a tenured professor of surgery and biomedical and translational sciences at the Carle Illinois College of Medicine. He is also a founder professor in The Grainger School of Engineering in the Department of Bioengineering, as well as a professor at the Beckman Institute for Advanced Science and Technology.

His research covers several areas, including novel approaches to tissue engineering to create functional organs from fat stem cells; the creation of a novel class of anticancer drug compounds that target chaperone proteins; nanoparticle drug-delivery systems for cancer and bone regeneration; and the use of mixed reality and AI/ML technologies to improve telemedicine and clinical care delivery, as well as healthcare workforce training and education.

MODERATOR

Gladys Fernandez, MD

Baystate Simulation Center

Gladys Fernandez, MD, completed undergraduate bachelor's degrees in chemistry, anthropology, and sociology at Florida International University in Miami, Florida, and then received her MD degree from Tufts University School of Medicine in Boston, Massachusetts. She completed surgical residency at Baystate Medical Center in Springfield, Massachusetts, where she has remained in several roles dedicated to undergraduate, graduate, and continuing medical education. At present, in the Department of Surgery, she is assistant program director in surgery at UMMS-Chan-Baystate Medical Center and clerkship director for undergraduate medical education. Institutionally, she is interim associate designated institutional official for the Office of Healthcare Education and medical co-director of the Baystate Special Pathogens Unit, a designated state Ebola treatment center. Within the institution managing hospital-based simulation programs, she is the director of simulation education for the Baystate Simulation Center and Goldberg Surgical Skills Laboratory, a Level I ACS-accredited Comprehensive Education Institute. She holds positions on the ACS Education Institute's Curriculum Committee (newly appointed Vice-Chair), the ACS/ASA Education Collaborative Group (member) and the ACS Simulation Surgical Educator Certification Advisory Committee (member).

Dr. Fernandez has dedicated her education and research endeavors toward curriculum development and implementation, assessment and remediation practices, macrosystem simulation, and faculty development in feedback and debriefing.

PANELISTS

John T. Paige, MD, FACS

Surgeon Educator, Louisiana State University

Dr. Paige is a professor of clinical surgery, with appointments in anesthesiology and radiology at the LSU Health New Orleans School of Medicine, who has dedicated his academic career to simulation-based training, research, and education in both surgical and health professional education. He serves as overall and surgical director of the ACS Accredited Education Institute at the School of Medicine. He is a Member of the ACS Academy of Master Surgeon Educators. He has held several leadership positions on national societal committees related to simulation and surgical education and has conducted research for federal and national societal grants related to simulation-based team training and assessment. He has published, including co-editing three books, and presented extensively on simulation-based training, interprofessional education, surgical skills acquisition, debriefing, teamwork, human factors, and surgical education.

Ganesh Sankaranarayanan, PhD

Academic Engineer, The University of Texas Southwestern Medical Center

Dr. Sankaranarayanan received his MS from The University of Texas at Arlington in 2002 and a PhD from the University of Washington in 2007, both in electrical engineering. From 2008 to 2015, he was involved in surgical simulator development and research at the Center for Modeling, Simulation, and Imaging in Medicine (CeMSIM) at the Rensselaer Polytechnic Institute in Troy, NY, and at the Beth Israel Deaconess Medical Center in Boston. From 2015 to 2021, he was the assistant director of the Center for Evidence-Based Simulation at Baylor University Medical Center in Dallas and a clinical associate professor in the Department of Surgery at Texas A&M College of Medicine. Currently, he is an associate professor in the Department of Surgery with a joint appointment in biomedical engineering at the UT Southwestern Medical Center, where he co-directs the Center for Assessment of Surgical Proficiency, which focuses on surgical simulation and surgical proficiency and the director of the artificial intelligence and medical simulation (AIMS) lab. He is a Surgical Education Research Fellow (SERF) from the Association of Surgical Education. His NIH R01 funded research is focused on simulation in healthcare, artificial intelligence for surgical education and assessment, surgical robotics, and haptics.

Henry Lin, PhD

Industry Engineer, Intuitive Surgical

Dr. Lin has been in the robotic surgery research and education fields for more than 18 years. His first interaction was with the da Vinci surgical robot in 2005 as part of his PhD work on the language of surgery at Johns Hopkins University under Gregory Hager. His thesis on surgical motion and other published papers on robotic surgical technical skills are some of the earliest works in the field. After his doctorate, Dr. Lin did a post-doc at the National Institute on Alcohol Abuse and Alcoholism at the National Institutes of Health. He then joined the medical research team at Intuitive in 2011, working with various internal and external groups to research and study the validation of the da Vinci robot and simulator. He then joined the simulation team to apply his research to product development. He currently leads the entire product development of the SimNow Simulation portfolio at Intuitive. His main interests are in robotic surgical metrics, simulation exercise designs in relation to learning objectives, RAS learning frameworks, and productizing the most effective training tools for robotic surgeons. He continues to hold strong excitement and optimism over the future of robotic surgery and its positive impact on patients. Dr. Lin also has computer science degrees from Columbia University and Carnegie Mellon University.

Oral Presentation Abstracts

O-01
Research Abstract
Recent Advances of Transformers in Endoscopic Video Analysis: A Review

Abhisri Ramesh Abdulla Ahmed, Myra Zaheer, Nishanth Gowda, Arhum Naeem, and Daniel Donoho George

Washington University School of Medicine and Health Sciences, Washington, DC; Children's National Hospital, Washington, DC

O-02
Research Abstract
Feasibility of Augmented Reality-Based Procedural Checklist for In-Patient Bedside EVD Placement

Joshua Olexa, MD, Annie Trang, MBE, Graeme Woodworth, MD, FACS, and Gary Schwartzbauer, MD, PhD, FACS

University of Maryland School of Medicine, Baltimore, MD

O-03
Promoting Technology and Collaboration
Novel Augmented Reality-Based Surgical Simulator Empowering the Modern Surgical Team: Bridging Skill Gaps in the Digital Era

Zaina Aloul, MBBCh, Mohammed El-Bahnasawi, BSc, MBBS, Samuel Colman, MBBCh, Nayaab Abdulkader, MBChB, Pramod Luthra, MS, FRCS, MA, Jeremy Brown, PhD, and David Rawaf, BSc, MBBS, MSc

Cardiff University School of Medicine, Cardiff, United Kingdom; Wythenshawe Hospital, Manchester University Foundation Trust, Manchester, United Kingdom; Manchester University NHS Foundation Trust, Manchester, United Kingdom; Southend Hospital, Mid Essex NHS Trust, Essex, United Kingdom; Edge Hill University, Lancashire, United Kingdom; Inovus Medical, London, United Kingdom

O-04
Research-in-Progress
Acquisition of Cardiopulmonary Resuscitation Skills in Mixed Reality for Effective Discharge Training of the Families of Pediatric Patient

Paul Jeziorczak, MD, MPH, FACS, and Inki Kim, PhD

University of Illinois Urbana-Champaign, Urbana, IL

O-05
Research Abstract
AI Model Improvement of FLS PEG Transfer Competency after Video Annotation Optimization

Andrew Hu, MD, Usman Roshan, PhD, Justin Ady, MD, Rohit Muralidhar, Joelle Getrajdman, MD, FACS, Jenny Cai, MD, FACS, Nell Maloney-Patel, and Advaith Bongu, MD, FACS

Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; New Jersey Institute of Technology, Newark, NJ; Nova Southeastern University, Fort Lauderdale, FL

O-06
Research-in-Progress
Automated Overhead Operating Room Lights for Increased Surgical Safety and Efficiency

Andrew Schindler, Sarah Hakam, Zach Mendoza, Tristen Slamowitz, and Ahmad Tabatabaeishoorijeh

Texas A&M University School of Engineering Medicine, Houston, TX

O-07
Research Abstract
Machine Learning Vision System for Measuring Colonoscope Control During Training

Hang-Ling Wu, Scarlett Miller, and Jason Moore

The Pennsylvania State University, State College, PA

O-08
Research Abstract
AdaptiveSAM: Towards Efficient Tuning of SAM for Surgical Scene Segmentation

Jay Nitin Paranjape, Nithin Gopalakrishnan Nair, Shameema Sikder, MD, FACS, S. Swaroop Vedula, and Vishal M. Patel

Johns Hopkins University, Baltimore, MD

O-09
Promoting Technology and Collaboration
Fostering Innovative Mindsets among Medical Students through Multidisciplinary Collaboration

Nagham Toba, MD, Mowafak Alzoebi, MD, Hind Alawadi, Marwa Mohamed, MD, Thomas Boillat, PhD, and Homero Rivas, MD, MBA, FACS

Mohammed Bin Rashid University of Medicine and Healthcare Sciences, Dubai, United Arab Emirates

VIEW FULL ABSTRACTS

Poster Group A

P-A-01
Research Abstract
Navigating Laparoscopic Camera Skills: Unveiling the Need and Efficacy of a Low-Fidelity Training Curriculum for Medical Students

Lea Ann Salvador Urita, MD, MPH, A. Garcia, MD, S. Ghuman, MS, C. Tran, MD, L. T. Knowlin, MD, B. Jean, MS, A. Jones, DO, S. Wexner, MD, FACEP, Y. B. Chen, MD, FACOG, FPMRS, and T. Chang, MD, MAcM

Kern Medical Center/University of California Los Angeles, Bakersfield, CA; Children's Hospital Los Angeles, Los Angeles, CA

P-A-02
Research-in-Progress
Discovering the Brainstem: An Interactive Web-Based Atlas

Sydney Zhou, BA, BE, Duncan Salmon, BA, Emily Minner, BS, Gayatri Prakash, BS, Deeksha Sarda, BS, Kunal Jain, BS, and Leslie Day, PhD

Texas A&M University School of Engineering Medicine, Houston, TX

P-A-03
Research-in-Progress
Quantitative Analysis of Wounds to Aid in At-Home Chronic Wound Care: A Web Application

Gayatri Prakash, Varshni Nandakumar, Duncan Salmon, Deeksha Sarda, and Amulya Srivatsa

Texas A&M University School of Engineering Medicine, Houston, TX

P-A-04
Research Abstract
A Composite Hydrogel Small Bowel for Small Bowel Anastomosis Training

Alex Gong, Shi-Wen Olivia Yau, Hans B. Erickson, Conner J. Parsey, Jack E. Norfleet, PhD, and Robert M. Sweet, MD, FACS

University of Washington, Seattle, WA; US Army DEVCOM Soldier Center, Orlando, FL

P-A-05
Research Abstract
Differences in Objective Performance Indicators During Robotic Right Colectomy in Obese and Non-Obese Patient Populations

Mishal Gillani, MD, Manali Rupji, MS, Virginia L. O. Shaffer, MD, FACS, Patrick Sean Sullivan, MD, FACS, Glen C. Balch, MD, FACS, Mallory Shields, PhD, Terrah Paul Olson, MD, FACS, Yuan Liu Liu, PhD, and Seth Alan Rosen, MD, FACS

Emory University School of Medicine, Atlanta, GA; Winship Cancer Institute, Emory University, Atlanta, GA; Intuitive Surgical, Seattle, WA; Rollins School of Public Health, Emory University, Atlanta, GA

P-A-06
Research-in-Progress
Differences in Objective Performance Indicators Between Expert, Intermediate and Novice Surgeons During Mobilization Steps of Robotic Right Colectomy

Mishal Gillani, MD, Manali Rupji, MS, Patrick Sean Sullivan, MD, FACS, Virginia L. O. Shaffer, MD, FACS, Glen C. Balch, MD, FACS, Mallory Shields, PhD, Terrah Paul Olson, MD, FACS, Yuan Liu Liu, PhD, and Seth Alan Rosen, MD, FACS

Emory University School of Medicine, Atlanta, GA; Winship Cancer Institute, Emory University, Atlanta, GA; Intuitive Surgical, Seattle, WA; Rollins School of Public Health, Emory University, Atlanta, GA

P-A-07
Challenges in Surgical Education
Efficacy and Transferability of Midlevel Fidelity Surgical Simulators: Development of Custom Simulators of Anomalous Variation of Hepatobiliary Anatomy for Cholecystectomy

Shawn Moore, EdD, Charmee Mehta, MD, Margaret Monette Romine, MD, Stephen Gregg, MD, Will Molair, MD, and Carl Eugene Haisch, MD, FACS

East Carolina University Brody School of Medicine, Greenville, NC

Poster Group B

P-B-01
Research-in-Progress
Eye-Tracking Surgical Headlamp for Improved Intraoperative Visualization and Efficiency

Sarah Hakam, BS, Zachary Mendoza, BS, Andrew Schindler, BS, Tristen Slamowitz, Ahmad Tabatabaeishoorijeh, BS, Nicholas Sears, PhD, and Sylvia Martinez, MD, FACS

Texas A&M University School of Engineering Medicine, Houston, TX; Houston Methodist Hospital, Houston, TX

P-B-02
Promoting Technology and Collaboration
Leveling Up Surgical Education: Exploring Collaborations with the Gaming Industry for Innovative Training

Sarah Hakam, BS, Anwar Hakam, Paras Gupta, MHE, Isuru Somawardana, BS, Nicholas Sears, PhD, and Rhome Hughes, MD

Texas A&M University School of Engineering Medicine, Houston, TX

P-B-03
Research Abstract
Three-Dimensional Printing in Surgical Education: An Updated Systematic Review of the Literature

Iulianna Taritsa, Daniela Lee, Jose Foppiani, Angelica Hernandez Alvarez, Kirsten Anne Schuster, MD, and Samuel Jui-Wen Lin, MD, MBA, FACS

Beth Israel Deaconess Medical Center, Boston, MA

P-B-04
Research-in-Progress
Advancing Minimally Invasive Surgeries: An Ergonomic Laparoscopic Grasper for Comfort and Precision

Deeksha Sarda, Gayatri Prakash, April Lovelady, PhD, and Nicholas Sears, PhD

Texas A&M University School of Engineering Medicine, Houston, TX

Posters Presentation Abstracts *(continued)*

P-B-05
Research-in-Progress
A Device for Intra-Abdominal Clip Loading During Robotic Cholecystectomy

Jaden Thomas Aland, BS, Emily Minner, BS, Sydney Zhou, BA, BE, Maya Pimentel, BS, BA, Amulya Srivatsa, BS, Nicholas Sears, PhD, and Nicole Marie Tapia, MD, FACS

Texas A&M University School of Engineering Medicine, Houston, TX; Houston Methodist Hospital, Houston, TX

P-B-06
Research-in-Progress
Enhancing Cardiac Surgeons' Ergonomics: Minimizing the Neck Movements During Heart Surgery Using Micro-Monitors

Rubayet Kamal, and Rabin Gerrah

Meharry Medical College, School of Medicine, Nashville, TN; Stanford University, Stanford, CA

P-B-07
Research-in-Progress
High Fidelity Trauma Operative Simulation for Rising Senior Residents

Devin Gillaspie, MD, Brian James Daley, MD, FACS, Melinda Klar, RN, and Judy Roark

University of Tennessee Medical Center Knoxville, Knoxville, TN

Poster Group C

P-C-01
Research-in-Progress
Point of Care Diagnostic Wearable for Traumatic Brain Injury Diagnosis and Characterization

Arsallan Nisar, MHS, Paras Gupta, MBE, Hamza Memon, BS, Sarah Hakam, BS, Nick Panzo, BS, Aiza Nisar, BS, and Andrew Robbins, PhD

Texas A&M University School of Engineering Medicine, Houston, TX

P-C-02
Challenges in Surgical Education
Improving Low-Cost, Reusable Pericardiocentesis Models with Synthetic Gelatin

Akshaj Pandey, Ritikha Vengadesh, Ysabelle Ibarrola, Alexandria Lo, Darsh Patel, David Shreiber, PhD, and Colleen M. Donovan, MD, CHSE, FACEP

Rutgers University School of Engineering, Piscataway, NJ; Rutgers Robert Wood Johnson Medical School, Piscataway, NJ

P-C-03
Research Abstract
Low-Cost Emergency Department Thoracotomy Simulation Improves Surgical Residents Confidence and Knowledge

Erick Lee Przybylski, MSMS, Emma Huston, MSc, Rahima Osman, and Nicole Lena Werner, MD, MS, FACS

University of Wisconsin-Madison, Madison, WI

P-C-04
Research Abstract
Correcting for Rater Effects in Surgical Skills Assessment in the Operating Room

Ryan Chou, Hajira Naz, Kofi D. O. Boahene, Jessica H. Maxwell, John R. Wanamaker, MD, Patrick J. Bryne, MD, Ira D. Papel, Theda C. Kontis, Gregory D. Hager, PhD, Lisa E. Ishii, Sonya Malekzadeh, S. Swaroop Vedula, and Masaru Ishii

Whiting School of Engineering, Johns Hopkins University, Baltimore, MD; Johns Hopkins University School of Medicine, Baltimore, MD; MedStar Georgetown University Hospital, Washington, DC; Cleveland Clinic, Cleveland, OH

P-C-05
Research Abstract
Instructive Feedback for Video-Based Surgical Coaching

Ryan Chou, Brittany Tsou, Jiawei Zhao, S. Swaroop Vedula, and Shameema Sikder, MD, FACS

Whiting School of Engineering, Johns Hopkins University, Baltimore, MD; Johns Hopkins University School of Medicine, Baltimore, MD

P-C-06
Research Abstract
Localizing Steps in Cataract Surgical Videos

Nisarg A. Shah, Shameema Sikder, MD, FACS, S. Swaroop Vedula, and Vishal M. Patel

Johns Hopkins University, Baltimore, MD

P-C-07
Challenges in Surgical Education
Utility of Virtual Reality Game Development Engines in Surgical Training

Paras Gupta, MBE, Sarah Hakam, Arsallan Nisar, Isuru Somawardana, Muhammad Hamza Memon, and Nicholas Sears, PhD

Texas A&M University School of Engineering Medicine, Houston, TX

P-C-08
Research Abstract
Segmentation of Surgical Motion Using Instantaneous Screw Axes

Heath James Boyea, and Ann Majewicz Fey, PhD

University of Texas at Austin, Austin, TX

Poster Group D

P-D-01
Challenges in Surgical Education
Challenges in Early Exposure to Microsurgery in Medical School

Daniela Lee, Iulianna Taritsa, Jose Foppiani, MD, Angelica Hernandez Alvarez, Kirsten A. Schuster, MD, and Samuel J. Lin, MD, MBA, FACS

Beth Israel Deaconess Medical Center, Boston, MA

P-D-02
Research-in-Progress
Cutting to the Chase: Is There a Relationship Between Mechanical Properties and Haptic Fidelity?

Kyleigh Kriener, Raushan Lala, and Mark John Midwinter, MD, FRACS

University of Queensland, Brisbane, Australia

Posters Presentation Abstracts *(continued)*

P-D-03
Promoting Technology and Collaboration
Digital Stethoscopes for Live Broadcast in Educational Environments

Christopher Chaftari, Duncan Salmon, Kunal Jain, Ronald Sperry, Keyvon Rashidi, and John Wilson, MD, PhD

Texas A&M University School of Engineering Medicine, Houston, TX

P-D-04
Research Abstract
Cross-Dataset Adaptation for Instrument Classification in Cataract Surgery Videos

Jay Nitin Paranjape, Shameema Sikder, MD, FACS, Vishal M. Patel, and S. Swaroop Vedula

Johns Hopkins University, Baltimore, MD; Johns Hopkins University School of Medicine, Baltimore, MD

P-D-05
Research-in-Progress
Challenges of Surgical Hand Tools with Large Grip Spans Amongst Small-Handed Surgeons

Shehr Hussain, and Susan Carter, MD, FACS

Rocky Vista University, Aurora, CO

P-D-06
Promoting Technology and Collaboration
The Role of Real-World Video Data and Its Application to Virtual Reality in Surgical Simulation

Priya Arunachalam, MD, MBA, MEng, Audrey Jones, MBA, and Aldona Spiegel, MD

Houston Methodist Hospital, Houston, TX

P-D-07
Research Abstract
Climbing the Prototype Fidelity Ladder: Unveiling Expert Insights on Central Venous Catheterization Simulator Utility

Haroula M. Tzamaras, Jessica Marie Gonzalez-Vargas, Jason Moore, and Scarlett Miller

The Pennsylvania State University, State College, PA

Poster Group E

P-E-01
Research Abstract
Addressing the Fidelity of Materials Used in Surgical Simulator Design: The Muscle Surrogate

Leonie Heskin, FRCSI, MSc, PhD, Ciaran Simms, Rose Galvin, and Oscar Traynor, MCh, FRCSI, FACS (Hon)

Royal College of Surgeons in Ireland, Dublin, Ireland; Trinity College Dublin, Dublin, Ireland; University of Limerick, Limerick, Ireland

P-E-02
Research Abstract
Stakeholder Requirements for the Design of an Optimal Surgical Simulator

Leonie Heskin, FRCSI, MSc, PhD, Rose Galvin, Ciaran Simms, and Oscar Traynor, MCh, FRCSI, FACS (Hon)

Royal College of Surgeons in Ireland, Dublin, Ireland; University of Limerick, Limerick, Ireland; Trinity College Dublin, Dublin, Ireland

P-E-03
Research-in-Progress
Vision-Based Tooltip Tracking for Automated Surgical Skill Assessment in Robotic Surgery

Bhargav Ghanekar, Lianne Rachel Johnson, Randolph H. Steadman, MD, MS, Stephen L. Jones, MD, MSHI, Rodolfo Jose Oviedo, MD, FACS, Ashok Veeraraghavan, PhD, and Marcia O'Malley, PhD

Rice University, Houston, TX; Houston Methodist Hospital, Houston, TX

P-E-04
Challenges in Surgical Education
Video-Based Task Robotic Cholecystectomy

Daniel Alejandro Tomey, MD, Rebecca Wu, Ray Chihara, MD, FACS, Nicole Tapia, MD, FACS, Sylvia Martinez, MD, FACS, Min Kim, MD, FACS, and Edward Y. H. Chan, MD, FACS

Houston Methodist Hospital, Houston, TX

P-E-05
Research-in-Progress
3D-Printed-Model Training to Facilitate Plate Contouring in Surgical Stabilization of Rib Fractures

Allen Yi, MD, Krishna Patel, MD, and William B. DeVoe, MD, FACS

OhioHealth Riverside Methodist Hospital, Columbus, OH

P-E-06
Research Abstract
Computer Simulation Can Augment Preoperative Planning of Periacetabular Osteotomies

Anthony Eshareturi, BS, Shuyang Han, PhD, Alfred Mansour, MD, Philip Noble, PhD, and Nicholas Dunbar, PhD

Texas A&M University School of Engineering Medicine, Houston, TX; McGovern Medical School at University of Texas Health Houston, Houston, TX

P-E-07
Research Abstract
Hernia Tutor: Evaluating the Use of an Open Inguinal Hernia Repair Training System

Aden Jefferson Wong

Queen's University, Toronto, ON, Canada

Do-It-Yourself (DIY) Competition Entries

The aim of the inaugural Do-It-Yourself (DIY) Simulator/Model Competition is to promote the development of DIY simulators and models to improve simulation-based surgical education and training. The DIY theme reflects the strong spirit of innovation and drive for improving educational outcomes championed by the surgical simulation-based education community. The competition received great interest and will feature 20 DIY entrants demonstrating innovative and cost-effective surgical simulation solutions they have developed. Dedicated time for the DIY Competition in the Surgeons and Engineers Meeting program will ensure that all attendees are able to explore the creative and impactful innovations from the community. A panel of expert judges will evaluate the entries, and the top three entries will be recognized. Additionally, we encourage all attendees to vote for their top DIY simulator/model for the notable Popular Vote award.

DIY-A-01
Trauma Team REBOA Simulator
Rosa Anna Chorro
Mayo Clinic, Rochester, MN

DIY-A-02
Field Chest Tube Insertion Simulator
Remigio Flor, MD
US Army, Department of Defense

DIY-A-03
Re-Entry Sternum Simulator
Ruth Rogers, DJ Traina, Jason Speich, and Dan Burke
University of Washington, Seattle, WA

DIY-A-04
KINETIC (Kidney INtelligent Experimental Transplant and Integration Companion)
Abhinay Tumati
New York-Presbyterian Hospital/Weill Cornell Medical Center, New York, NY

DIY-A-05
Low-Cost Oocyte Retrieval Simulator
Ritika Pansare
Michigan Medicine 3Di Lab, University of Michigan, Ann Arbor, MI

DIY-A-06
TrocarTactile Trainer
Kyleigh Kriener
The University of Queensland, Brisbane, Australia

DIY-A-07
Bleeding Vessel Litigation Trainer
Kamini King
Parkview Mirro Simulation Lab, Fort Wayne, IN

DIY-A-08
Vascular Shunting and Anastomosis Simulator
Elizabeth Weissbrod, MA, CMI, FAMI
The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., in Support of the Uniformed Services University of the Health Sciences, Silver Spring, MD

DIY-A-09
Transperineal Ultrasound-Guided Prostate Biopsy Model
Darian L. Hoagland, MD, and William Faust, MD
Lahey Hospital & Medical Center, Burlington, MA

DIY-A-10
Fully Immersive Virtual Reality for Skull-Base Surgery (FIVRS)
Nimesh Nagururu
Johns Hopkins University, Baltimore, MD

DIY-B-01
Abdo Wall Model
Judy Roark
UT Center for Advanced Medical Simulation, Knoxville, TN

DIY-B-02
3D-Printed Iliac Fossa Simulator for Advanced Training in Open Surgical Skills
Alyssa D. Murillo
University of California San Francisco, San Francisco, CA

DIY-B-03
Modular Tracheostomy Complication Task Trainer
Brian Kaufman
NYU Grossman School of Medicine, New York, NY

DIY-B-04
Low Anterior Resection Inanimate Model
Jimmie Knight III
Rush University Medical Center, Chicago, IL

DIY-B-05
Thyroidectomy Model
Andres Abrue
University of Texas Southwestern Medical Center, Dallas, TX

DIY-B-06
Cricothyrotomy Simulator
Remigio Flor, MD
US Army, Department of Defense

DIY-B-07
Design of a Robotic Transabdominal Preperitoneal Inguinal Hernia Repair Training Model
Shakira Burton
University of Texas Southwestern Medical Center, Dallas, TX

DIY-B-08
Training Model for Cranial Burr Holes
Jenny Garnett
WISH-University of Washington, Seattle, WA

DIY-B-09
EchoSim
Scott Sumpter
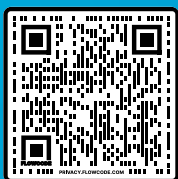*London Health Sciences Centre, London, ON, Canada*

DIY-B-10
Lubox Carry On
Juan Ignacio Cobian
Creative Lab/ INSPIRE Simulacion Femeba, Buenos Aires, Argentina

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Exhibitors

Sponsorship and Exhibit Opportunities

The Annual ACS Surgeons and Engineers: A Dialogue on Surgical Simulation meeting is growing. This meeting both welcomes and encourages sponsorship and exhibit opportunities are available on a first-come, first-served basis.

SPONSORSHIP
Various levels of sponsorship opportunities are available.

EXHIBITORS
Meeting participants have asked for exhibitor involvement. Exhibitors are welcome and invited to participate in this meeting.

Please visit *facs.org/surg-eng* for more information about the 2025 meeting opportunities.

2025 ACS SURGEONS AND ENGINEERS

A Dialogue on Surgical Simulation

SAVE THE DATE March 19, 2025, Chicago IL

Call for Abstracts in May 2024 / Registration will open late Fall

*facs.org/**surg-eng***

2024 MEETING SURVEY

Thank you for attending
the 2024 ACS Annual Surgeons and Engineers:
A Dialogue on Surgical Simulation Meeting.

In order to better serve the surgical and engineering communities, we ask that you complete a brief survey. Please share what you found valuable about today's content, and changes or additions that would be impactful in the future.

NAVIGATE TO:
https://redcap.link/2024SurgEndFeedback
OR SCAN THE QR CODE
with your smartphone camera to access the survey

ACS/ Education

American College of Surgeons

We offer you our sincere thanks for attending this meeting and we hope you have gained beneficial insights and inspiration from this dialogue and activity.

We welcome your input. Please contact Gyusung Lee, PhD, at glee@facs.org or 312-202-5782 with any questions, comments, and suggestions to benefit the planning of future meetings.

ACS/ AMERICAN COLLEGE OF SURGEONS