

CAROLINE GL CAO, PHD

Titulaire Chaire Industrie du Futur

Professor of Computer Science, IMT Atlantique, Brest, France

Visiting Professor of Future Industries Institute and STEM, University of South Australia, Adelaide, Australia

Laboratoire des Sciences et Techniques de l'information de la Communication et de la Connaissance (Lab-STICC), UMR CNRS 6285

Professor of Biomedical, Industrial & Human Factors Engineering

Professor of Mechanical and Materials Engineering

College of Engineering and Computer Science, Wright State University

Professor of Trauma Care and Surgery

Boonshoft School of Medicine, Wright State University

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PROFILE

Tenured full professor, researcher, educator and entrepreneur with extensive experience and achievements in research management; curriculum development; teaching and mentoring students, staff, and fellows; academic and scientific leadership; budget and finance management; entrepreneurship; and science policy advocacy.

Research expertise in human factors in medical systems and devices/cyber-human systems, design and evaluation of complex sociotechnical systems and enabling technology (AR/VR, simulation and training, decision aid, sensory substitution, navigational aid, robotics, situation awareness, teamwork, communication, etc.) for minimally invasive surgery and robotic surgery/healthcare and patient safety.

Research development for Industry 4.0, focused on partnerships with manufacturing industries, in digital twins, human-cobot interaction, artificial intelligence, XR technology, and system resilience.

SKILLS SUMMARY

Proven leader recognized for vision, energy and integrity, able to work effectively across disciplinary boundaries and with multiple stakeholders. Leadership experience and management skills include:

- Team building: bringing together diverse groups of professionals to work collaboratively
- Excellent communication: able to see and sell the "big picture" to engage people
- Identifying, recruiting and developing talent from diverse backgrounds
- Leading and mentoring multidisciplinary researchers at all levels
- Fostering a collegial environment and inclusive culture
- Resource management
- Crisis management
- Finance and budget management
- Value and act with transparency and integrity

LEADERSHIP TRAINING

Executive Leadership in Academic Technology and Engineering (ELATE), Drexel University, 2017-18
(IAP Topic: Building an Entrepreneurial Ecosystem at WSU and Beyond)
American Council on Education (ACE) Women's Network – Ohio Annual Conference, 2013, 2016
American Association of University Professors (AAUP) Summer Institute, Portland OR, 2016
Higher Education Resource Services (HERS) Summer Institute, Bryn Mawr College, 2013

EDUCATION

2016-present	MBA courses, Raj Soin School of Business Wright State University, Dayton, Ohio
2002	PhD, Mechanical & Industrial Engineering University of Toronto, Toronto, Canada
1999	Certificate, Strategic Management of Technology in a Global Environment Politecnico di Milano, Milan, Italy
1999	Certificate, Strategic Management of Telecommunications Institute of Strategy and International Business, Helsinki University of Technology, Helsinki, Finland
1996	MS, Kinesiology Simon Fraser University, Burnaby, Canada
1994	Post-Bac Diploma, Occupational Science Simon Fraser University, Burnaby, Canada
1991	BS, Biochemistry (major), Kinesiology (minor) Simon Fraser University, Burnaby, Canada

INDUSTRY EXPERIENCE

ENDO GUIDANCE TECHNOLOGIES LLC:

Endo Guidance Technologies is a Dayton-based company that offers sensing and display technology for navigation in non-rigid environments. Our mission is to enable image guidance without the use of x-rays.

Founder & CEO (2016-present)

Responsibilities:

- Provide leadership for technical and business development
- Engage with industry partners, manufacturers, and regulatory agencies
- Engage with customers (OEM, physicians, and purchasers in hospitals and clinics)
- Engage with Board of Advisors and investors
- Recruit technical and business talent
- Fundraising (over \$515,000)

ACADEMIC EXPERIENCE

IMT ATLANTIQUE:

Professor of Computer Science, and Endowed Chair in Industry of the Future, 05/2021-present

UNIVERSITY OF SOUTH AUSTRALIA:

Visiting Professor of STEM, Future Industries Institute, 08/2021-present

Research Responsibilities:

- Provide vision and strategic plan for a joint research program in Industry of the Future between IMT Atlantique and University of South Australia
- Provide leadership and mentorship to researchers and students at both universities and labs

- Build relationships and collaborative projects with industry partners
- Design academic program in Industry 4.0
- Develop cotutelle (dual PhD) programs and exchange programs between France and Australian universities
- Coordinate research proposals and contracts
- Conduct research and develop tools for Industry 4.0
- Manage over 300k € research grants and industry contracts from ANR, Airbus, Captronic, and InterCarnot

WRIGHT STATE UNIVERSITY:

Professor (tenured) of Biomedical, Industrial & Human Factors Engineering, 01/2012-present (currently on leave)

Professor of Mechanical & Materials Engineering, 01/2012-present

Professor of Trauma and Surgery, Boonshoft School of Medicine, 01/2012-present

Research Responsibilities:

- Conduct research and develop enabling technology in complex sociotechnical systems
- Write research proposals
- Managed over \$2.5M research funding from the NSF, NIH, ONR, Ohio Third Frontier, WSU
- Supervised thesis and projects (12 graduate students, 2 undergraduate honors theses, 11 special projects and capstones, 25 postdocs and research associates)

Faculty Responsibilities:

- Develop and teach undergrad and grad courses in Medical Device, Human Factors Engineering
- Developed Dual-PhD Degree (COTUTELLE) MOU between WSU and 2 French Universities (Ecole Centrale de Nantes and Ecole des Mines de Nantes)
- Member of Steering Committee for University Strategic Plan
- Coordinator of Biomedical Engineering Undergraduate Program
- Chair of Curriculum in the Biomedical Engineering Program
- Chair of Petitions Committee
- Chair of Department Faculty Development Committee (Tenure & Promotion and Awards)
- Director of Graduate Admissions for Industrial and Human Factors Engineering Program
- Member of faculty search committees
- Member of College Undergraduate Policy and Curriculum Committee
- Member of College Faculty Development Committee (T&P and Awards)
- Faculty Senate (*Graduate Faculty Membership Committee, International Education Advisory Committee, Recruiting and Outreach, Buildings and Grounds Committee, Ad hoc Select Committee on Research Initiatives at WSU, Chair, ad hoc committee for graduate student success, 2014-15*)
- Chair of College Steering Committee (shared governance)
 - Advise Dean of the College on matters ranging from budget to accreditation (ABET) to enrollment and instructional support
 - Review the fiscal affairs of the college at least annually
 - Coordinate the revision of College bylaws, and policies and procedures
 - Interact with Faculty Senate and administrators for approval of changes in College bylaws, and policies and procedures
 - Supervise the review of the Dean by faculty and staff, and other matters requiring faculty representation
 - Communicate with College faculty and staff
 - Promote collaboration between faculty, staff and administration in shared governance
 - Facilitate problem resolution within collective bargaining and strong shared governance environment
- Member of Research Council, Engineering Faculty Representative
 - Revise Policy on Research Misconduct, 2014
 - Review faculty research grant proposals and select awardees based on merit

Ohio Research Scholar (endowed), Ohio Imaging Research and Innovation Network (OIRAIN) 01/2012-12/2015

The Ohio Imaging Research and Innovation Network is a consortium of three universities in the State of Ohio (Wright State University, Case Western Reserve University, and the Ohio State University) for the creation of intellectual property, commercialization, and jobs in Ohio in the field of medical imaging through research and education.

Research Responsibilities:

- Invent patentable technology
- Launched a technology start-up in medical devices
- Fundraise
- Manage day-to-day operations
- Supervise researchers, grad students
- Negotiate vendor contracts
- Project management
- Manage budget of \$330,000

TUFTS UNIVERSITY:

Director (09/2001-12/2011)

Human Factors Engineering (HFE) Program, School of Engineering

The HFE Program is the first undergraduate major BS degree-granting program in Human Factors in the US. As an academic unit within the School of Engineering, it consisted of 2 full-time faculty members, 2 part-time lecturers, 3 affiliated faculty, and about 30 undergraduate majors and 10 MS students.

Administrative Responsibilities:

- Provide leadership for teaching and research within program
- Engage with industry to promote visibility of program
- Interact with administrators and faculty in other departments and colleges to develop course offerings to support interdisciplinary program and cross-list courses
- Develop and update the undergraduate and graduate program curricula
- Develop, maintain and update the minor program curriculum
- Maintain and update certificate in Human-Computer Interaction
- Recruit, admit and advise undergraduate and graduate students
- Recruit and hire lecturers and a Professor-of-the-Practice
- Develop industry partnerships for Senior Capstone projects and **internships**
- Interact with alumni and industry leaders to promote growth of program
- Develop relationships with Alumni and local chapters of professional societies
- Advise Tufts Student Chapter of Human Factors and Ergonomics Society
- Develop and taught undergraduate and graduate courses
- Advise undergrad and graduate student thesis projects
- Day-to-day duties and program management including class scheduling, responding to internal and external enquiries and requests, coordinating with program requirements in engineering, computer science and psychology

Associate Professor (tenured) of Mechanical Engineering, 09/2008-12/2011

Adjunct Associate Professor of Biomedical Engineering, 09/2008-12/2011

Assistant Professor of Mechanical Engineering, 09/2001-08/2008

Research Responsibilities:

- Founded the Tufts Ergonomics in Remote Environments Laboratory (EREL)
- Direct research program in enabling technology for minimally invasive surgery and patient safety
- Manage over \$3M research funding from the NSF (Early Career Award), NIH, ONR, Broad Medical Foundation, SAGES, Tufts

- Supervise theses and projects (33 graduate students, 5 undergraduate honors students, 11 postdocs and research associate)

Faculty Responsibilities:

- Develop and teach undergrad and grad courses in Medical Device, Analytical Methods, Human Factors Engineering, and Biomechanics
- Advisor to over 200 undergraduate and graduate students
- Member, Committee on Committees, 2011
- Member, Academic Awards Committee, 2010-2011
- Member, Institutional Review Board, 2002-2004
- Chair, Academic Standing Committee, 2003-2009
- Research Director, Tufts Medical Centre for Human Factors and Surgical Skills Research, 2003-2011
- Faculty advisor, Student Chapter of Human Factors and Ergonomics Society, 2001-2011
- Faculty advisor, Human-Computer Interaction Certificate Program, 2001-2011
- Faculty advisor, Robotics Academy, 2002-2006
- Member, Graduate Studies Committee - 2001-2011
- Chair, Graduate Curriculum Committee, 2007-2009
- Chair, Graduate Program Committee, 2008-2009

SIMON FRASER UNIVERSITY:

Research Coordinator, Human Motor Systems Laboratory, 09/1996-08/1997

Research Responsibilities:

- Write grant proposals
- Supervise student research assistants
- Recruit and prepare human subjects for human performance studies
- Collect and analyse qualitative and quantitative experimental data
- Prepare and present study results in verbal and written form for publication

OTHER ACADEMIC / RESEARCH EXPERIENCE

Chercheur au Laboratoire des Sciences et Techniques de l'information de la Communication et de la Connaissance (Lab-STICC) (UMR CNRS 6285), 05/2021-present

RFI Chaire Internationale, Recherche, Formation et Innovation (RFI), Atlanstic 2020, Nantes, France, 2019-21

Chercheur au Laboratoire des Sciences du Numérique de Nantes (LS2N) (UMR CNRS 6004), 2019-21

Distinguished Visiting Scientist, Australian e-Health Research Centre, The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Brisbane, Australia, 2013

Chaire Régionale de Chercheur Étranger de la Région Pays de la Loire (Research Chair of Loire Region), Nantes, France, 2009-2011

PROFESSIONAL LEADERSHIP EXPERIENCE

ASSOCIATE EDITOR:

Human Factors (2017-present)

Journal of Advances in Human-Computer Interaction (2007-present)

IEEE Transactions on Human-Machine Systems (formerly SMC, Part A: Systems and Humans) (2012-16)

Principle Responsibilities:

- Manage review of submissions
- Recruit reviewers
- Evaluate papers for fit, scope, length, merit, etc.
- Communicate with authors and provide guidance where needed

HUMAN FACTORS AND ERGONOMICS SOCIETY (HFES):

The world's largest scientific association for human factors and ergonomics professionals, with more than 4,500 members around the world.

Executive Committee of HFES Executive Council (2021-present)

Member-at-Large of Executive Council (2021-present)

Chair, Task Force on Code of Conduct (2022)

Past Secretary-Treasurer (2021-2022), Secretary-Treasurer (2019-2020), Secretary-Treasurer-Elect (2018-2019)

Chair, Crisis Management Committee, 2019-2020

Chair, Finance and Investment Committee, 2019-2020

Chair, COTG Budget and Finance Committee, 2011

Principle Responsibilities:

- Manage annual budget (\$2.2M) for society operations and conferences
- Review monthly financials
- Prepare financial contingency plans in response to COVID-19
- Advise Executive Council regarding investment policy
- Manage nominations and election of executive council members

Chair, Human Factors Prize Panel, 2016-2019

Chair, Chapanis Student Paper Award Committee, 2007-14

Principle Responsibilities:

- Manage review of submissions and selection of awardees
- Solicited submissions from multiple scientific communities
- Recruited reviewers and judges
- Selected topics for annual HF Prize (\$10,000 purse)
- Communicated with authors regarding topic, scope, length and merit of papers
- Coordinate with Society office to deliver awards to winners

Chair, Committee of Technical Groups (COTG), 2012-13

Chair, Health Care Technical Group, HFES, 2006-08

Chair, Health Care Technical Group, Technical Program, 2004-06

Principle Responsibilities:

- Solicit submissions for annual conference
- Recruit reviewers for conference submissions
- Manage review of submissions and selection of papers
- Coordinate schedule of papers and sessions for conference
- Manage special initiatives for technical groups (e.g., travel grants, social events, etc.)
- Conduct business meetings
- Chair nominations and elections of officers
- Perform outreach and communication with members

OTHER PROFESSIONAL SOCIETY LEADERSHIP AND SERVICE

IEEE, 2003 to present

Chair, Human-Computer Interaction Technical Committee, SMC, 2015-2018

Registration Chair, Haptics Symposium, 2020 (Washington, DC), 2022 (UC Santa Barbara, CA)

Human Factors and Ergonomics Society (HFES)

Science and Policy Fellow, 2018-21

Co-Founder, Early Career Professionals Group

Associate Editor, Human Factors, 2017-present

Associate Editor, Journal of Advances in Human-Computer Interaction, 2007-present

Associate Editor, IEEE Transactions on Human-Machine Systems (formerly SMC, Part A: Systems and Humans), 2012-16
Associate Editor, IEEE Transactions on Systems, Man and Cybernetics, Part A: Systems and Humans), 2008-12
Ohio Order of Engineers, 2013-present
Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), 2006-present
SAGES Committees: Technology; Fundamentals of Laparoscopic Surgery, 2011-present
American Society of Mechanical Engineers (ASME), 2003-present
Track co-chair, Technical programme committee, ASME ESDA 2012, 11th biennial conference on engineering systems design and analysis, 2-4 July 2012, Nantes, France
Board of Directors, Charter Member (2002), Human Factors and Ergonomics Society, New England Chapter, 2002-05
North American Society for the Psychology of Sport and Physical Activity (NASPSPA), 1993-2006
Société Canadienne D'Apprentissage Psychomoteur et de Psychologie du Sport (SCAPPS), 1993-96

Reviewer of scientific journals: Applied Ergonomics, ACM Transactions on Computer-Human Interaction, Behaviour & Information Technology, British Medical Journal – Quality and Safety in Health Care, Human Factors, IEEE Transactions on Systems, Man, and Cybernetics – Part A: Systems and Humans, IEEE Transactions on Haptics, Journal of Applied Research in Memory and Cognition, Journal of Cognitive Engineering and Decision Making, Surgical Endoscopy, Surgical Innovation, World of Surgery, Frontiers in Psychology.

Reviewer for funding agencies: French National Research Agency (ANR), Natural Sciences and Engineering Research Council of Canada (NSERC), National Science Foundation (NSF), National Institute of Health (NIH) – NCI, SBIB, NIBIB, SBIR, Technology Foundation STW (Netherlands funding agency for academic research in applied sciences), The US Military (Army Medical Research Acquisition Activity (USAMRAA), United Kingdom Research and Innovation Medical Research Council, Israel Science Foundation.

Reviewer for technical conferences: Human Factors and Ergonomics Society Conference, Design of Medical Devices (DMD), SAGES, IEEE SMC, IEEE World Haptics

Reviewer for publishers: CRC Press, Taylor & Francis, Lawrence Erlbaum Associates Publishers

Consultant for: St. Jude Medical, Inc., Charles River Analytics, Inc., Cambridge Health Alliance Hospital

HONORS AND AWARDS

- Service Excellence Award, College of Engineering and Computer Science, Wright State University, 2019
- Fellow, Human Factors and Ergonomics Society, elected 2018
- Science Policy Fellow, Human Factors and Ergonomics Society, 2018-
- ELATE Fellow, nominated and selected 2017-18
- US Fulbright Scholar (host: Vietnam), USA Department of State, 2016-17
- Eminent Engineer, Tau Beta Pi Ohio Mu Chapter, elected 2016
- HERS Fellow, nominated and selected 2013
- Ohio Research Scholar, Ohio Imaging Research and Innovation Network (OIRAIN), 2012-2015
- Mellon Foundation Research Grant, Tufts University, 2006
- NSF Early CAREER Award, National Science Foundation, 2003
- Chapanis Best Student Paper Award, Finalist, Human Factors and Ergonomics Society, 2001
- Claudette MacKay-Lassonde Scholarship (Women in Engineering), U of T Nominee, Canadian Engineering Memorial Foundation, 2000
- Ontario Graduate Scholarship, University of Toronto, 1999-2001

- University of Toronto Graduate Fellowship, 1997-99
- Gordon Diewert Fellowship, SFU, 1997 (declined)
- SFU Graduate Fellowship, SFU, 1997 (declined)
- Gordon M. Shrum Scholarship, SFU, 1985-1988
- MacKenzie King Entrance Scholarship, UBC, 1985 (declined)
- Vancouver Citizenship Award, 1985
- BC Scholar, 1985

RESEARCH & TRAINING AWARDS RECEIVED

Title	Agency	Role	Period	Total Amount	My Share
Focus Area 1: Industry 4.0					
1. RFI Development	Université de Nantes	PI	2022	3,500 €	3,500 €
2. Modelling Human & System Resilience	Airbus CR&T	PI	2022	90,000 €	90,000 €
3. AI@IMT	ANR	PI	2021-2023	48,000 €	48,000 €
4. Federation of Digital Twins for SME	Captronic	Participant	2021	30,000 €	--
5. XR Technology for Industry 4.0	ANR MRSEI	PI	2021-2022	30,000 €	30,000 €
6. TwinCoBot	InterCarnot Institutes	PI	2022	130,000 €	130,000 €
7. Identification of Human Factors Issues in System Resilience	Airbus CR&T	PI	2021	30,000 €	30,000 €
8. Modelling Social Stress in VR (MISSIVES)	CLARTE	Participant	2021-2024	48,000 €	48,000 €
9. CPER Industrie du Futur	Region Bretagne	Participant	2021-2026	80,000 €	80,000 €
Focus Area 2: Technology Translation/Commercialization					
10. EndoGPS™ – Technology Validation and Startup Fund (TVSF Phase 2)	Ohio Third Frontier Commission	PI	2019-2020	\$150,000	\$150,000
11. EFOST Prototype Development	WSARC	PI	2018	\$150,000	\$150,000
12. Ohio@ICorps Program	Ohio Department of Higher Education	PI	05/01/2016 – 04/30/2017	\$15,000	\$15,000
Focus Area 3: Biomaterials					
13. Advanced biomaterial characterization	AFRL/DAGSI Ohio Student-Faculty Research Program	PI	08/27/2018-08/26/2019	\$44,130	\$44,130
Focus Area 4: Development of Technology for Minimally Invasive Surgery and Medical Procedures					

14. Virtual reality mentee-mentor multimodal collaboration for surgical skills training (Show-Me)	Agence Nationale de Recherche (AAPG2020)	Co-I (PI: Chellali, U. d'Evry)	03/2021-02/2023	247,923 €	--
15. Smart fibre-based shape sensor	Max-Planck-Institute for Intelligent Systems (Grassroots 2020)	PI (Multiple PIs: Cao, Javot, Volchkov)	01/2020-12/2020	17,800 €	17,800 €
16. Intelligent coach for medical simulation training (CCATT)	WSARC IRAD	PI	01/01/2020-06/30/2020	\$20,000	\$20,000
17. Human factors for medical technologies (FaMe)	NEXT Health and Engineering Integrative Research Clusters, Nantes, France	Scientific Advisor	07/2018-06/2021	210,000 €	--
18. Development and validation of a Virtual Airway Skill Trainer (VAST)	National Institute of Health (NHLBI 1R01HL119248-01A1)	Co-I	04/2014-03/2018	\$2,962,918	\$401,428
19. Feasibility study of ICG imaging in cholecystectomy	WSU Research Initiation Grant	PI	2013-2014	\$20,000	\$20,000
20. Development and validation of The <i>Virtual Electrosurgical Skill Trainer (VEST)</i>	National Institute of Health (NIBIB 1R01EB014305-01)	PI (Multiple PIs: Cao, De, Jones)	09/2012-08/2017	\$3,600,000	\$475,053
21. Physically Realistic Virtual Surgery (GEN2)	National Institute of Health (NIBIB R01 2R01EB005807-05A1)	PI (Multiple PIs: Cao, De, Jones)	08/2011-07/2016	\$3,500,000	\$444,500
22. Developing Physics-Based Virtual Simulation Technology for Natural Orifice Translumenal Endoscopic Surgery (NOTES)	National Institute of Health (NIBIB 1R01EB009362-01A2)	PI (Multiple PIs: Cao, De, Jones)	05/2011-04/2016	\$3,535,278	\$395,125
23. Laparoscopic Surgery Training System (LASTS)	US Office of Naval Research & TATRC (SBIR Phase II)	Co-PI (Lead institution Charles River Analytics, Inc.)	2011-2013	\$750,000	\$265,082

24. Laparoscopic Surgery Training System (LASTS)	US Office of Naval Research (SBIR Phase I	Co-PI (Lead institution Charles River Analytics)	2010	\$70,000	\$10,000
25. Development and Validation of a Virtual Basic Laparoscopic Skill Trainer (VBLaST)	National Institute of Health (NIBIB 1R01EB10037-01)	PI (Multiple PIs: Cao, De, Jones)	06/2010-05/2015	\$2,160,000	\$417,040
26. A Phase I Trial of Continuous Low-Irradiance Photodynamic Therapy for Post-Mastectomy Chest Wall Recurrences of Breast Cancer	Susan G. Komen Breast Cancer Foundation	Co-I (Lead institution Tufts Medical Centre)	2007-2010		\$264,233
27. Image-Guidance Research in Colonoscopy to Improve Diagnosis of IBD	Broad Foundation Medical Research Grant	PI	2007-2009	\$217,832	\$217,832
28. Adapting to Technology in Minimally Invasive Surgery	National Science Foundation Career Award (NSF Grant IIS-0238284)	PI	2003-2008	\$651,361	\$651,361
29. Surgical Skills in Robotic Surgery	Tufts University Faculty Research Award	PI	2002	\$5,000	\$5,000
Focus Area 5: Haptics in Surgical Applications					
30. Haptic Evaluation Procedure	AtlanSTIC 2009 (CNRS FR2819, France)	Co-PI (PI: Dumas, Ecole des Mines de Nantes)	2010	9,100 €	--
31. Soft Tissue Measurement and Modelling for Surgical Simulation and Visualisation	Tufts University School of Engineering Research Funding	PI	2008-2009	\$5,000	\$5,000
32. Smart Codec with Telesurgery Capability	Department of Defence Telemedicine and Advanced Technology Research Centre (SBIR Phase II	Participant (Lead institution Energid, Inc.)	2007-2009	\$750,000	--
33. Role of Haptic Feedback and Cognitive Load in Laparoscopic Surgery Performance	Society of American Gastrointestinal and Endoscopic	PI	2007-2008	\$20,000	\$20,000

	Surgeons (SAGES) Research Grant				
34. The Vanderbilt Reynolds Geriatrics Centre	D.W. Reynolds Foundation	Participant (PI: Powers)	2006-2008	\$1,999,798	--
35. Soft Tissue Strength Measurement	Tufts University Faculty Research Award	PI	2003	\$5,500	\$5,500
Focus Area 6: Equipment Grants					
36. Acquisition of a Scientific Visualization Facility	National Science Foundation	Senior Personnel (PI: Boghosian)	2006	\$350,000	--
37. Integrated Information Display for OR Team	Tufts University Faculty Research Award (Mellon), Junior Research Semester Fellowship	PI	2006	semester leave	semester leave
38. Human Factors Usability Laboratory at Tufts	Tufts University Academic Technology Faculty Grant	PI	2002-2003	\$30,000	\$30,000
39. Biomedical MEMS Microfabrication Facility and Biomedical Device Design, Evaluation and Usability Laboratory	Lufkin Memorial Fund	Primary Contributor	2002-2003	\$200,000	--
Focus Area 7: Education & Student Success					
40. The CECS Student Success Scholarship Program: Leveraging Curricular Innovation in Engineering and Computer Science Education	National Science Foundation (NSF DUE-1356518)	Co-PI (PI: Klingbeil)	06/01/2014-05/31/2019	\$614,096	--
41. Tufts-CSEMS Scholars Program	National Science Foundation (NSF Grant DUE-0631054)	Co-I (PI: Souvaine)	2006-2010	\$499,560	--
42. Tufts-CSEMS Scholars Program	National Science Foundation (NSF Grant DUE-0220651)	Co-PI (PI: Souvaine)	2002-2006	\$385,000	--
43. Multi-Threaded Instruction: Forming Multi-disciplinary Research Groups to Improve Undergraduate Education	National Science Foundation (NSF Grant EEC-0212046)	Co-PI (PI: Rogers)	2002-2005	\$372,972	--

PUBLICATIONS & SCHOLARLY ACTIVITIES***Summary of research output:***

Patents: 2 issued, 2 pending

Journal articles: 50

Book chapters: 3

Conference proceedings: 90

Abstracts & Posters: 67

Technical Reports: 12

Invited presentations: 86 (5 keynotes)

Patents (4)

1. PCT/US17/55346 (US 62/404,370), Sensorized guidewire and catheter. Inventor Cao. Filed Oct 2017.
2. US 8,219,180 B2, System and method employing fiber optic shape tracking. Inventors Cao, Lilge, Milgram, Wong. Issued July 10, 2012.
3. US 8,725,234 B2, Systems, devices, and methods employing fiber optic shape tracking. Inventors Cao, Lilge, Milgram, Wong. Issued May 13, 2014.
4. US 2010/0120006 A1, Dynamic minimally invasive training and testing environments. Inventors Bell, Cao, Johanas, Leisk, Saide, Schwaizberg. Published May 13, 2010.

Refereed Journals (Total 50 published)**Theme 1: Surgical Simulation Technology & Skills Training**

1. Dombek, M., Courant, R., Lungarini, A., Santos, N., Schwaizberg, S., Cao, C.G.L., Jones, D., De, Suvranu, Olasky, J. (2018). FUSE certification enhances performance on a virtual computer-based simulator for dispersive electrode placement. *Surgical Endoscopy*, 32(8), 3640-3645. DOI: 10.1007/s00464-018-6095-2
2. Linsk, A., Monden, K., Sankaranarayanan, G., Ahn, W., Jones, D., De, S., Schwaizberg, S., Cao, C.G.L. (2018). Validation of the VBLaST pattern cutting task: a learning curve study. *Surgical Endoscopy*, 32(4), 1990-2002. DOI: 10.1007/s00464-017-5895-0
3. Maddah, M. & Cao, C.G.L. (2017). Application of the alpha method to visualize and analyze surgical motion. *Surgical Science*, 8(11) 2017.
4. Dorozhkin, D., Olasky, J., Jones, D.B., Schwaizberg, S.D., Jones, S.B., Cao, C.G.L., Molina, M., Henriques, S., Wang, J., Flinn, J., De, S., and the SAGES FUSE Committee (2017). OR fire virtual training simulator: design and face validity. *Surgical Endoscopy*, 31(9), 3527-3533.
5. Chellali, A., Mentis, H., Miller, A., Ahn, W., Arikatla, V., Sankaranarayanan, G., De, S., Schwaizberg, S., Cao, C.G.L. (2016). Achieving interface and environmental fidelity in the virtual basic laparoscopic surgical trainer. *International Journal of Human-Computer Studies*, 96, 22-37.
6. Dorozhkin, D., Nemani, A., Roberts, K., Ahn, W., Halic, T., Dargar, S., Wang, J., Cao, C.G.L., Sankaranarayanan, G., De, S. (2016). Face and content validation of a Virtual Transluminal Endoscopic Surgery Trainer (VTEST). *Surgical Endoscopy*. DOI: 10.1007/s00464-016-4917-7
7. Demirel, D., Butler, K.L., Halic, T., Sankaranarayanan, G., Spindler, D., Cao, C.G.L., Petrusa, E., Molina, M., Jones, D., De, S. DeMoya, M. (2015). A hierarchical task analysis of cricothyroidotomy procedure for a virtual airway skills trainer (VAST) simulator. *American Journal of Surgery*, 212(3), 475-484.
8. Awtrey, C.S., Chellali, A., Schwaizberg, S.D., De, S., Jones, D.B., Cao, C.G.L. (2015). Validation of the VBLaST: A virtual peg transfer task in gynecologic surgeons. *The Journal of Minimally Invasive Gynecology*, 22(7), 1271-1277.
9. Sankaranarayanan, G. Li, B., Manser, K. Jones, S.B., Jones, D.B., Schwaizberg, S., Cao, C.G.L., De, S. (2016). Face and Construct Validation of a Next Generation Virtual Reality (Gen2-VR[®]) Surgical Simulator. *Surgical Endoscopy*, 30(3), 979-985.
10. Olasky, J., Sankaranarayanan, G., Seymour, N.E., Magee, J.H., Enquobahrie, A., Lin, M.C., Aggarwal, R., Brunt, L.M., Schwaizberg, S.D., Cao, C.G.L., De, S., Jones, D.B. (2015). Identifying Opportunities for Virtual Reality Simulation in Surgical Education; A Review of the Proceedings from the Innovation, Design, and Emerging Alliances in Surgery (IDEAS) Conference: VR Surgery, Nov 23, 2013. *Surgical Innovation*, 22(5), 514-521.

11. Chellali, A., Ahn, W., Sankaranarayanan, G., Flinn, J.T., Schwaitzberg, S.D., Jones, D.B., De, S., Cao, C.G.L. (2014). Preliminary evaluation of the pattern cutting and the ligating loop virtual laparoscopic trainers. *Surgical Endoscopy*, 29(4), 815-821.
12. Chellali, A., Zhang, L., Sankaranarayanan, G., Cao, C.G.L. (2014). Validation of the VBLaST peg transfer task: A first step towards an alternate training standard. *Surgical Endoscopy*, 28(10), 2856-2862.
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Abstracts & Posters (Total 67)

1. Cao, C.G.L. & Topolski, C. (2019). Physician and patient trust in robotic surgery. Presented at the *2019 International Symposium on Human Factors and Ergonomics in Health Care*, Chicago, IL, March 24-27, 2019.
2. Topolski, C., Mensah, A., Cao, C.G.L. (2018). Trust in robot-assisted surgery. Presented at the *BMES 2018 Annual Meeting*, Atlanta, GA, October 17-20, 2018.
3. Hamdan, M. & Cao, C.G.L. (2018) Investigating the after-effects of stochastic resonance for use in laparoscopic surgery. Presented at the *IEEE Haptics Symposium 2018*, San Francisco, CA, March 25-28.
4. He, S., Goonetilleke, R., Cao, C.G.L. (2018). Hardness perception of viscoelasticity in a probing task. Presented at the *IEEE Haptics Symposium 2018*, San Francisco, CA, March 25-28.
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22. Miller, A., Saxe, J., Cao, C.G.L. (2014). ICG infrared imaging: a novel alternative to intraoperative cholangiography. Presented at the *2014 SAGES Annual Meeting*, Salt Lake City, UT, April 2-5, 2014.
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25. Baichun, L., Sankaranarayanan, G., Jones, S. Jones, D.B., Schwaitzberg, S., De, S., Cao, C.G.L. (2014). Preliminary validation of a novel VR2C (VR within VR) simulator for surgical education. Presented at the *2014 Surgical Education Week of the Annual Meeting of the Associate for Surgical Education*, Chicago, IL, April 8-12, 2014.
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27. Abtahi, K., Flinn, J., Yaklic, J., Cao, C.G.L., Galloway, M. (2014). Smart phones and intraoperative assessment of obstetric and gynecologic residents: The future is here! *The 2014 CREOG and APGO Annual Meeting*, Atlanta, GA. Feb. 26-Mar. 1, 2014.
28. Flinn, J., Wood, D., Cao, C.G.L. (2013). Technology-based procedure for automatic and objective error measurement in FLS pattern cutting task. Presented at *The Annual Meeting of the Society of Gastrointestinal and Endoscopic Surgeons (SAGES)*, Baltimore, MD, April 17-20, 2013.
29. Sankaranarayanan, G., Zhang, L., De, S., Jones, D. B., Schwaitzberg, S., Cao, C.G.L. (2013). The learning plateau and the learning rate for the VBLaST-PT compared to the FLS simulator. Presented at the *2013 Association For Surgical Education (ASE) Annual Meeting*, Orlando, FL.
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31. Chellali, A., Sankaranarayanan, G., Zhang, L., Cao, C.G.L., De, S., Jones, D.B., Schneider, B. (2013). Effects of sleep hours and fatigue on performance in laparoscopic surgery simulators. Presented at *The Annual Meeting of the Society of Gastrointestinal and Endoscopic Surgeons (SAGES)*, Baltimore, MD, April

17-20, 2013.

32. Cao, C.G.L., Matthews, G., Malek, D., Neville, K., Ryan, J., Schneider, M. (2013). Panel: Human factors in robotics safety: From individual to organisation. *2013 Safety Across High Consequence Industries (SAHI) Conference, St. Louis, March 12-13, 2013.*
33. Cao, C.G.L., Wong, P.Y., Eisenstein, J. (2011). Development of a shape tracker for colonoscopy navigation. *The Annual Meeting of the Society of Gastrointestinal and Endoscopic Surgeons (SAGES), Emergent Technology.* San Antonio, TX, March 30-April 2, 2011.
34. Bell, A., Schwaitzberg, SD, Cao, C.G.L. (2009). Using vibration to provide force information during surgery. Presented at the 2009 Meeting of the *Society of American Gastrointestinal and Endoscopic Surgeons*, April 22-25, 2009, Phoenix, Arizona. **BEST POSTER AWARD**
35. Lin, H., Sankaranarayanan, G., Jones, D.B., Sreekanth, A.V., Mulcare, M., Zhang, L., Derevianko, A., Lim, R., Fobert, D., Cao, C.G.L., Schwaitzberg, S.D., De, S. (2009). Steps toward virtual reality FLS: Virtual Basic Laparoscopic Skill Trainer (VBLAST) preliminary face and construct validity study. Presented at the 2009 Meeting of the *Society of American Gastrointestinal and Endoscopic Surgeons*, April 22-25, 2009, Phoenix, Arizona.
36. Gavalis, R.M., Xing, H., Wong, P.Y., Lilge, L., Cao, C.G.L. (2008). Design of a navigational aid for colonoscopy. Presented at the *3rd Frontiers in Biomedical Devices Conference, Proceedings of BioMed2008*, Irvine, CA, June 18-20, 2008. *Journal of Medical Devices*, 2(2), 027523. <http://link.aip.org/link/?MED/2/027523> **BEST POSTER AWARD -- 2ND PLACE**
37. Gavalis, R., Xing, H., Wong, P.Y., Lilge, L., Cao, C.G.L. (2008). Design of a real-time guidance system for colonoscopy. Presented at *the 2008 Design of Medical Devices Conference*, Minneapolis, Minnesota, April 15-17, 2008.
38. Zhou, M., Tse, S., Derevianko, A., Jones, D.B., Schwaitzberg, S.D., Cao, C.G.L. (2008). Learning Curve in Laparoscopic Suturing With Haptic Feedback. Presented at *the 2008 meeting of the Society of American Gastrointestinal and Endoscopic Surgeons*, Philadelphia, PA, April 9-12, 2008.
39. Bell, A., Saide, M., Johanas, J., Leisk, G., Schwaitzberg, S.D., Cao, C.G.L. (2008). Using a Dynamic Training Environment to Assess Laparoscopic Skill. Presented at *the 2008 Meeting of the Society of American Gastrointestinal and Endoscopic Surgeons*, Philadelphia, PA, April 9-12, 2008.
40. Bell, A., Mandelupe, E., Schwaitzberg, S.D., Cao, C.G.L. (2008). Speed-Accuracy Trade-off in VR Simulator with Haptic Feedback. Presented at *the 2008 meeting of the Society of American Gastrointestinal and Endoscopic Surgeons*, Philadelphia, PA, April 9-12, 2008.
41. Barrios, L., Tsuda, S., Derevianko, A., Barnett, S., Moorman, D., Cao, C.G.L., Jones, D.B. (2008). Framing family conversation after early diagnosis of iatrogenic injury and incidental findings. Presented at *the 2008 meeting of the Society of American Gastrointestinal and Endoscopic Surgeons*, Philadelphia, PA, April 9-12, 2008.
42. Dezube, R., Dale, C., Weinger, M., Muldoon, R., Ayers, G. D., Zhong, S., Cao, C.G.L. (2008). Procedural learning in simulated colonoscopy. Presented at *the 2008 International Meeting on Simulation in Healthcare*, San Diego, CA, January 13-16, 2008.
43. Barrios, L., Tsuda, S., Derevianko, A., Barnett, S., Moorman, D., Cao, C.G.L., Karavas, A.N., Jones, D.B. (2007). Framing family conversation after early diagnosis of iatrogenic injury and incidental findings. Presented at *the 54th Annual Meeting of the Massachusetts Chapter of the American College of Surgeons*, Boston, MA, December 8, 2007.
44. Dezube, R., Dale, C., Weinger, M., Muldoon, R., Ayers, G. D., Zhong, S., Cao, C.G.L. (2007). Procedural learning in simulated colonoscopy. Presented at *the NASPGHAN Annual meeting*, Salt Lake City, UT, October 25 -27, 2007.
45. Cao, C.G.L., Zhou, M.G., Jones, D.B., Schwaitzberg, S.D. (2007). Can surgeons think and operate with haptics at the same time? Presented at the *Society of Surgery of the Alimentary Tract 48th Annual Meeting*, Washington, DC, May 19-23, 2007. **POSTER OF DISCTINCTION AWARD**
46. O'Connor, A., Cao, C.G.L. & Schwaitzberg, S. (2007). Impact of knowledge of results in surgical skills training. *Surgical Endoscopy*, 21 (supplement 1), S312.
47. Bell, A., Johanas, J., Cao, C.G.L. & Schwaitzberg, S. (2007). Dynamite skill assessment system: initial evaluation. *Surgical Endoscopy*, 21 (supplement 1), S344. **POSTER OF DISTINCTION AWARD**

48. Vuong, L., Schwaizberg, S., Cao, C.G.L. (2006). What can motion derivatives tell us about skill performance. *Surgical Endoscopy*, 20 (Supplement 1), S254-282.
49. Nguyen, T., Schwaizberg, S., Cao, C.G.L. (2006). Effect of friction and vision on simulated laparoscopic surgery performance. *Surgical Endoscopy*, 20 (Supplement 1), S254-282.
50. Rivera, C. & Cao, C.G.L. (2005). The effect of tool angle on force perception in a simulated laparoscopic environment. Presented at the *New England Surgical Society Annual Meeting*, Boston, MA, May 27, 2005.
51. Avgerinos, D., Rivera, C., Schwaizberg, S., Cao, C.G.L. (2004). Visual and force feedback in laparoscopic robotic manipulation. Presented at the *New England Surgical Society*. Montreal, Canada, September 30, 2004.
52. Goodell, K., Avgerinos, D., Cao, C.G.L., Schwaizberg, S. (2004). The effects of distraction on performance of laparoscopic surgical tasks. Presented at the *New England Surgical Society*. Montreal, Canada, September 30, 2004.
53. Cao, C.G.L. & Schwaizberg, S. (2004). An alternative to haptics in robotic surgery. *Surgical Endoscopy*, 18 (5), 725-878.
54. Cao, C.G.L., Waxberg, S., Park, B., Schwaizberg, S. (2004). Comparison of real versus virtual surgical training models. *Surgical Endoscopy*, 18 (5), 725-878.
55. Cao, C.G.L. (2004). Hand-eye co-ordination in simulated laparoscopic surgery. *Journal of Sport & Exercise Psychology*, 26: S47.
56. Cao, C.G.L., Schwaizberg, S., Rogers, G. (2003). Visuomotor constraints in laparoscopic surgery: a human factors engineering perspective. *Surgical Endoscopy*, 17 (Supplement), S218-314.
57. MacKenzie, C.L., Ibbotson, J.A., Cao, C.G.L., Lomax, A.J. (2000). Hierarchical decomposition of goal-directed activity: a valuable research and investigative tool for minimally invasive surgery. Poster presented at the *7th World Congress of Endoscopic Surgery*. Singapore, May 28-June 5, 2000, 409.
58. Cao, C.G.L. & Milgram, P. (2000). Augmented reality displays for endoscopic orientation and navigation. Abstracts of the *31st International Symposium on Robotics/ 9th Annual Institute for Robotics and Intelligent Systems/PREARN Conference*. Montreal, Quebec, May 14-17, 2000.
59. Milgram, P. & Cao, C.G.L. (1999). Mixed reality in the OR. Abstracts of the *9th Annual Institute for Robotics and Intelligent Systems/PREARN Conference*, Toronto, Canada, June 7-9, 1999.
60. MacKenzie, C.L., Cao, C.G.L., Nagy, A.G., Turner, L.J., & Lomax, A.J. (1997). Quantifying surgeons' performance. *The International College of Surgeons XXXV North American Federation Congress: Enabling Technologies of the Minimal Access Revolution*. Vancouver, BC, July 24-26, 1997.
61. Cao, C.G.L. & MacKenzie, C.L. (1997). Direct, 2-D vs. 3-D endoscopic viewing & surgical task performance. A Symposium on Evolving Technologies: Surgeons' Performance of Surgical Tasks. *J. Sport and Exercise Psychology*, 19, *NASPSA/ACSM Meeting*. Denver, Colorado, May 28-June 1, 1997.
62. MacKenzie, C.L., Cao, C.G.L., Turner, L.J., Blair, N.P., & Nagy, A.G. (1997). Endoscopic viewing technologies on surgeons' performance. *The 50th Annual Spring Meeting of the BC Surgical Society*. Victoria, BC, April 30-May 3, 1997.
63. Cao, C.G.L., MacKenzie, C.L., & Payandeh, S. (1995). Task analysis of laparoscopic surgery: Determination of requirements for endoscopic tool design. Abstracts *5th Annual IRIS/PREARN Conference*, Vancouver, Canada, June 1995.
64. Cao, C.G.L., MacKenzie, C.L., & Payandeh, S. (1996). Precision and safety constraints in laparoscopic surgery. *J. of Sport and Exercise Psychology*, Volume 18 Supplement, 19.
65. Cao, C.G.L., MacKenzie, C.L., & Payandeh, S. (1995). Remote manipulation in endoscopic surgery: A task analysis approach. Abstract *SCAPPS Annual Conference*. Vancouver, B.C., October 1995, 62.
66. Cao, C.G.L., & MacKenzie, C.L. (1995). Effect of fatigue on grip force in a precision grip. *J. Sport and Exercise Psychology*, Volume 17 Supplement, 36.
67. Cao, C.G.L. & Hair, M.L. (1989). Measurement of charge on sterically stabilised polyacrylic acid polystyrene particles. *Pacific Chemical Congress*. Honolulu, Hawaii, December 16-22, 1989.

Technical Reports (Total 12)

1. Allemang-Trivalle, A. & Cao, C.G.L. (2021). Review of human performance modelling approach in manufacturing. Report EREL-021 TR, December 2021.

2. Luu, D. & Cao, C.G.L. (2010). Design and development of a robotic arm prototype for needle insertion. Report EREL-010TR, July 2010.
3. Khawatmi, N., Cao, C.G.L. (2004). Digital vs. analogue displays for force application. Report EREL-007TR, August 2004.
4. Perreault, J. & Cao, C.G.L. (2004). Force measurements in MIS. Report EREL-006TR, August 2004.
5. Perreault, J., Rivera, C., Cao, C.G.L. (2004). Fibre optics and fluorophores. Report EREL-005TR, December, 2003.
6. Cao, C.G.L., Waxberg, S. (2003). Role of landmark in spatial orientation in colonoscopy. Report EREL-004TR, June 2003.
7. Webster, J., Cao, C.G.L. (2003). Effect of visual augmentation on laparoscopic and robotic surgery skills. Report EREL-003TR, April 2003.
8. Webster, J., Cao, C.G.L. (2003). Comparison of hierarchical decomposition of robotic and laparoscopic cholecystectomies. Report EREL-002TR, April 2003.
9. Cades, D., Cao, C.G.L. (2003). Effects of spatial maps in colonoscopy. Report EREL-001TR, December, 2002.
10. Cao, C.G.L. (1990). Ergonomic analysis of glass-washing station in a chemistry laboratory.
11. Cao, C.G.L. (1989). Mono-dispersed coloured silica particles for toner applications. Report for Xerox Research Centre of Canada, Mississauga, ON, December, 1989.
12. Cao, C.G.L. (1988). Electrophoretic properties of synthesised colloidal polystyrene. Report for Xerox Research Centre of Canada, Mississauga, ON, December, 1988.

Development of Educational Media & Textbook Chapter

1. Guest on Human Factors Interest Group Podcast. *HF Advocacy*. University of Toronto, July 26, 2021.
2. MacKenzie, C.L. & Cao, C.G.L. *Manipulation and remote manipulation in humans: Implications for sensorimotor organisation in the human brain*. Videotape (10 minutes) developed for International Symposium on Sensorimotor Representation in the Nervous System. In honour of Dr. Marcus Devanandan, Christian Medical College, Vellore, India, January 1997.
3. MacKenzie, C.L., Cao, C.G.L. & Ibbotson, J.L. *Remote manipulation in laparoscopic surgery and the Virtual Hand Laboratory*. Videotape (30 minutes) developed for Invited Dinner Address at the Industry Symposium on 3D Animation and 3D Interaction, Intel Corporation, Hillsboro, Oregon, December 1996.

Invited Presentations (Total 86)

1. **Keynote** at L’Innovation en Santé, Université Bretagne Sud et le Groupement Hospitalier Brocéliande Atlantique, Vannes, France, June 14, 2022.
2. Panelist at the 15th édition des Journées Scientifiques, Nantes Université, Nantes, France, June 3, 2022.
3. Moderator of breakout session on Industry-Education Engagement, ASEE Workforce Summit 4.0. Washington, D.C., April 25-26, 2022.
4. Panelist at German-French Industry of the Future Workshop, Comment Assurer la Confiance dans l’IA pour la Mobilité et al Logistique du future? (debate). (virtual meeting) January 26, 2022.
5. Panelist at joint panel of ICHMS and ISACT, Situation Awareness in Cognitive Technologies. Magdeburg, Germany, September 9, 2021.
6. Panelist at 3rd Annual Women in STEMM conference, Wright State University, March 17, 2021.
7. Panelist at Dayton Startup Week, Almost Free Money for Entrepreneurs. Dayton, Ohio, September 25, 2020.
8. **Keynote** at Journée STP – GDR MACS (Modélisation, analyse et conduite des systemes dynamiques). Nantes, France, February 12-13, 2020.
9. **Keynote** at HUGO 5ème Journée Scientifique. Rennes, France, December 18, 2019.
10. Gender Equality in Academic Research. Laboratoire des Sciences du Numérique de Nantes, October 1, 2019.
11. **Keynote** at Digital Week, Nantes, France, September 19, 2019.
12. Max-Planck-Institute for Intelligent Systems Invited Colloquium, May 23, 2019.
13. **Keynote** at the Journées de la Réalité Virtuelle (JRV2018), 13th Annual Meeting of the Association Française de Réalité Virtuelle (AFRV), Paris, France, October 29-31, 2018.

14. Human Factors in Product Design. Programme des journées jeunes chercheuses et chercheurs. JRV2018, 13th Annual Meeting of the Association Française de Réalité Virtuelle (AFRV), Paris, France, October 29-31, 2018.
15. Marquette University and the Wisconsin Medical College, December 14, 2017.
16. Robotic Surgery. Nanjing University Institute of Robotics, Nanjing, China, April 6, 2017.
17. Building a Career in Engineering and Medicine: Challenges for Women in STEM. American Center, US Consulate in Ho Chi Minh City, Vietnam, March 24, 2017.
18. International University, Vietnam National University in Ho Chi Minh City, Vietnam, March 6, 2017.
19. IRCCyN, Nantes, France. June 2, 2016.
20. Barn Gang, Dayton Engineers' Club, Dayton Ohio, September 22, 2015.
21. Université d'Evry Val d'Essonne, Evry, France, July 9, 2015.
22. Houston Methodist Hospital, Surgery Grand Rounds, January 28, 2015.
23. University of Toronto, MIE Seminar Series, November 28, 2014.
24. University of Toronto, HFIG Seminar, November 27, 2014.
25. Kettering College, Health Sciences Seminar, October 3, 2014.
26. Innovations in Medical and Surgical Education, presenter, Wright State University Boonshoft School of Medicine, September 19, 2014.
27. Wright State University, Alumni College, presenter, August 2, 2014.
28. Wright State University Direct Admit Day, Keynote speaker, Dayton, OH, March 15, 2014.
29. Wright State University E-Week and Celebration of Women in Engineering, Keynote speaker, Dayton, OH, February 21, 2014.
30. Innovation, Design, & Emerging Alliances in Surgery (IDEAS) Workshop, Beth Israel Deaconess Medical Center, Boston, MA, November 23, 2013.
31. The Australian e-Health Research Centre, CSIRO (Commonwealth Scientific and Industrial Research Organisation), Brisbane, Australia, August 2, 2013.
32. HFES, University of Queensland Chapter, July 27, 2012.
33. The Australian e-Health Research Centre, CSIRO (Commonwealth Scientific and Industrial Research Organisation), Brisbane, Australia, July 25, 2012.
34. Research Colloquium, Department of Psychology, College of Math and Science, Wright State University, Dayton, OH, USA, April 27, 2012.
35. Aptima, Inc. Dayton, OH, USA, March 22, 2012.
36. Ph.D. Seminar. College of Engineering and Computer Science, Wright State University, Dayton, OH, USA, March 2, 2012.
37. Human Factors in Undergrad and Graduate Education. Office of Admissions, Tufts University, Medford, MA, USA, September 9, 2011.
38. Human Factors Research in Endoscopic Surgery. Faculty of Medicine and Dentistry seminar, University of Alberta, Edmonton, Calgary, Canada, May 2, 2011.
39. Human Factors Research in Endoscopic Surgery. Department of Biomedical Engineering, Systems and Human Factors Engineering Seminar, Wright State University, Dayton, OH, April 8, 2011.
40. Human Factors Research and Development of Enabling Technology for Endoscopic Surgery. Presidential Seminar, Wright State University, Dayton, OH, October 21, 2010.
41. Research methods in human factors. Guest lecture in ASP Master's Programme, l'Ecole Centrale de Nantes, Nantes, France, December 10, 2009.
42. Human factors issues in minimally invasive surgery. Institut National Des Sciences Appliquees de Lyon, Lyon, France, December 7, 2009.
43. Human factors in robotic surgery. Guest lecture in European Masters on Advanced Robotics (EMARO) Programme, l'Institut de Recherche en Communications et Cybernétique de Nantes, Nantes, France, November 26, 2009.
44. Design for data visualisation and navigation. Guest lecture in graduate HCI course at l'Ecole des Mines de Nantes, Nantes, France, October 13, 2009.
45. Technology Development for Minimally Invasive Surgery. NSF WIRES (Women's International Research Engineering Summit), Barcelona, Spain, June 2-4, 2009.

46. Visuomotor Coordination in Endoscopic Surgery. *Design of Medical Devices Conference 2009*, Minneapolis, MN, April 14-16, 2009.
47. Human Factors Research in Robotic Surgery. *L'Institut de Recherche en Communications et en Cybernétique de Nantes, and l'École des Mines de Nantes*, Nantes, France, March 19, 2009.
48. Human Factors Research in Minimally Invasive Surgery. *L'Institut des Systèmes Intelligents et de Robotique, Université Pierre et Marie Curie*, Paris, France, March 13, 2009.
49. Fibre Optic Shape Tracking to Improve Inflammatory Bowel Disease Diagnosis. *Broad Medical Foundation Principal Investigator Annual Meeting*, Los Angeles, CA, February 13, 2009.
50. Human Factors Research in Minimally Invasive Surgery. *Center for Ergonomics, Transportation Research Institute, University of Michigan*, Ann Arbor, MI, May 5, 2008.
51. Improving Endoscopic Surgery Through Human Factors Engineering. *Tufts University Alumni Visit*. April 4, 2008.
52. Human Factors in Minimally Invasive Surgery. *ASME Boston Section Meeting*. Tufts University, March 25, 2008.
53. Research in Minimally Invasive Surgery. *Biomedical Engineering Seminar Series*. Tufts University, March 24, 2008.
54. Research Considerations in Simulation Training. *Establishing a Simulation and Skills Training Center: Comprehensive Educational Module*. Harvard Medical School CME Course. Boston, MA, March 14-16, 2008.
55. Human Factors Principles in Design. *Guest Lecture in ME 102 Inventive Design*, Mechanical Engineering, Tufts University, March 6, 2008.
56. Haptics in Minimally Invasive Surgery. Engineering Research Center for Computer-Integrated Surgical Systems and Technologies Seminar Series. Johns Hopkins University, Baltimore, ME, February 27, 2008.
57. HF Research in Minimally Invasive Surgery. *Ergonomics and Safety Research Group Seminar*. Harvard School of Public Health, Boston, MA, December 7, 2007.
58. Implementation: Bring New Technologies to Clinical Use. *Tufts University Research Days on Translational Research: Applying Discovery*. Tufts University, Boston, MA, November 29, 2007.
59. Surgical Ergonomics and Patient Care. *Mayo Clinic Conference on Human Factors in Health Care: Practical Applications to Improve Patient Safety*. Mayo Clinic CME Course. St. Paul, MN, October 17-19, 2007.
60. Human Factors Research using Surgical Simulation. Experimental-OP und Ergonomie, Universitätsklinikum Tübingen, Tübingen, Germany, July 5, 2007.
61. Human Factors and Surgical Education. Simulator Hands-On Course: Establishing a Skills Program. *Society of American Gastrointestinal and Endoscopic Surgeons Annual Meeting*, Las Vegas, April 18-22, 2007.
62. Enabling Technology for Endoscopic Surgery. *Alumni Campus Visit*. Tufts University, March 30, 2007.
63. Adapting to Technology in Endoscopic Surgery. *Tufts University School of Medicine and School of Engineering Alumni Event*, Palo Alto, Computer History Museum, February 6, 2007.
64. Surgical Simulation Training. *Tufts University School of Medicine and School of Engineering Alumni Event*, Palo Alto, Computer History Museum, February 6, 2007.
65. Visualisation in Endoscopic Environments. *Biomedical Informatics Seminar Series*. Vanderbilt University, November 9, 2005.
66. Human Factors Research in Endoscopic Surgery. *Patient Safety Seminar Series*. Vanderbilt University Medical Centre, October 25, 2005.
67. Input/ Output Devices. *Guest lecture in Computer Science Course CS 352: Human-Computer Interaction*. Vanderbilt University, October 11, 2005.
68. HF in Information Display Design. *Guest lecture in Mechanical Engineering*. Tufts University, March 31, 2005.
69. Addressing Human Factors Issues in Endoscopic Surgery. *Tufts University Biomedical Engineering Seminar Series*. Tufts University, October 22, 2004.
70. Integration of Enabling Technology into the OR, and Beyond. *Science Federation Forum on Human Factors and Patient Safety*. The National Academy of Sciences, Washington, DC, October 15, 2004.
71. Human Factors Engineering in Robotics Academy Project. *Tufts University Robotics Academy*. Tufts

- University, October 13, 2004.
72. Addressing Human Factors Issues in Endoscopic Surgery. *School of Engineering Seminar Series*. University of Miami, August 27 2004.
 73. Human Factors Research in Surgery: Adapting to Technology. *Grand Rounds*, Department of Anaesthesiology, Jackson Memorial Hospital, University of Miami, May 20, 2004.
 74. Human Factors Research in Endoscopic Surgery. *Dean's Safety Colloquium*, University of Miami, May 2004.
 75. MR (Mixed-Reality) in the OR. *Guest lecture in Biomedical Engineering*. Tufts University, February 18, 2004.
 76. Human Factors Research in Surgery. *Tufts University Dental School Colloquium*. September 9, 2003.
 77. Human Factors Engineering: Coupling People and Technology. Tufts University *PCET Workshop*, July 16, 2003.
 78. Tufts University Usability Laboratory. *All University Teaching and Research Conference*, Tufts University, Grafton Campus. April 25, 2003.
 79. Navigation and Orientation in Endoscopic Environments. *MVL/HST/HFES Special Seminar*, Department of Aeronautics and Aerospace, MIT. December 5, 2002.
 80. What Does a Human Factors Engineer Do? *Tufts University CSEMS Program Academic Speakers Series*. November 20, 2002.
 81. Navigation and Orientation in Non-Rigid Environments. *Tufts University Department of Psychology Colloquium*. March 14, 2002.
 82. Human Factors in Endoscopy. *Brock Rogers Surgical*, Norwood, MA, February 15, 2002.
 83. Human Factors in the Operating Room. Tufts University, *Mechanical Engineering Seminar Series*. Medford, MA, November 28, 2001.
 84. Orientation and navigation in endoscopy. *Colloquium on Human Factors in the Operating Room, the 43rd Annual Meeting of the Human Factors and Ergonomics Society*. Houston, Texas, September 27- October 2, 1999.
 85. Spatial visualisation in minimal access environments. *Human Factors Interest Group Seminar Series*, University of Toronto, March 24, 2000.
 86. Orientation and navigation in minimally invasive surgery. *Knowledge Media and Design Institute Seminar Series*, University of Toronto, December 2, 1999.

MEDIA COVERAGE

1. Industry of the Future. IMT Atlantique, June 16, 2021. <https://www.imt-atlantique.fr/fr/actualites/industrie-du-futur-une-nouvelle-chaire-dirigee-par-caroline-cao>
2. Dayton startups land \$100K+ for prototype development. Dayton Tech Guide, April 29, 2019. (https://daytontechguide.com/dayton-startups-lands-100k-for-prototype-development/?mc_cid=e64d2a1170&mc_eid=ad339f7011)
3. Optical Device Offers Less Painful Colonoscopy. Hospimedica.com, May 9, 2011 (http://www.hospimedica.com/surgical_techniques/articles/294734898/optical_device_offers_less_painful_colonoscopy.html)
4. A Less Painful Colonoscopy. Sciencedaily.com, April 28, 2011 (http://www.sciencedaily.com/releases/2011/04/110427091953.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily+%28ScienceDaily%3A+Latest+Science+News%29&utm_content=My+Yahoo)
5. The Grabbiest Lab in Boston. Discovery.com, June 6, 2008 (<http://news.discovery.com/tech/videos/tech-the-grabbiest-lab-in-boston.htm>)

TEACHING ACTIVITIES

Wright State University, 2012-present

BME/IHE 7370 Medical Devices (course originator; also distance offering)
IHE/ISE 6300/4300 Fundamentals of Human Factors Engineering (also distance offering)
IHE 7300 Research Methods in Human Factors Engineering (also distance offering)
BME/ISE/IHE 4310/6310 Ergonomics (also distance offering)
BME/IHE 7360 Cognitive Systems Engineering (also distance offering)
BME/ISE 4910/4920 Senior Design (Capstone course)
ISE/IHE/BME/NEU 4990/7990 Independent Study
ISE/BME/ME/NEU Honors Thesis

Tufts University, 2001-2011

ENP 061 Introduction to Human Factors and Ergonomics
ENP 162 Human-Machine Systems Design
ENP 163 Analytical Methods in Human Factors Engineering (course originator)
ENP 120 Human Systems Design (Capstone course)
ME 152 Biomechanics (course originator)
ENP 210 Human Factors in Medical Systems (course originator)

MENTORING ACTIVITIES

Co-Chair, Advisory Council for the WSU STEMMS Mentoring Circles, 2014-16
Faculty Advisor, Engineers Without Borders, Wright State University Chapter, 2014-16
Faculty Advisor, Postdoctoral Association, Wright State University Chapter, 2012-
Member, Women in Science Giving Circle, 2013-

Supervisor of Post-doctoral Associates and Researchers (28 total):

1. Zakaria Kaddour, MS (2020-21). Research Engineer. IMT Atlantique.
2. Jamaya Carter, BS (2016). STREAMS Scholar. Wright State University.
3. Thomas Simon, BS (2016). Visiting Scholar. Wright State University.
4. Fangshu He, BS (2016). Visiting Scholar. Wright State University.
5. Nicole Santos, BS (2016-2017). Research Coordinator. Cambridge Health Alliance Hospital.
6. Alyssa Lungarini, MS (2015). Research Coordinator. Cambridge Health Alliance Hospital.
7. Ali Linsk, MD (2014-2016). Research Fellow. Cambridge Health Alliance Hospital.
8. Jinling Wang, PhD (2013-2016). Post-doc Associate, Wright State University.
9. Jeff Flinn, MS (2012-2015). Research assistant, Wright State University.
10. Akole Mensah (2014-present). Biomedical Engineering undergrad student research assistant. Wright State University.
11. Katherine Babbitt, BS (2014-2016). Medical student research assistant. Wright State University.
12. Miller, Stephanie, BS (2014). Analysis of students' eye gaze during surgical skills training. NIH STREAMS Fellow. Wright State University.
13. Riyad Tayim, MS (2013-2014). Medical student research assistant. Wright State University.
14. Janine Dewar, MS (2014-2015). Research assistant, Cambridge Health Alliance Hospital.
15. Kelly Manser, BA (2013-2014). Research assistant, Cambridge Health Alliance Hospital.
16. Mary Runkle (2013-2014). Medical student research assistant. Wright State University.
17. Winnie Chen (2013-2014). Research Associate, Cambridge Health Alliance Hospital.
18. David Wood (2013-2014). Undergrad research assistant, Wright State University.
19. Natalie Pyatka, B.S. (2012-2015). Medical student research assistant, Wright State University.
20. Amie Miller, M.D. (2012-2014). Surgical Research Fellow, Wright State University.
21. Alexandra Geada (2013). Research Associate, Cambridge Health Alliance Hospital.
22. Helena Mentis, Ph.D. (2012-2013). Post-doc Associate, Cambridge Health Alliance Hospital.

23. Manuel Simoes, Ph.D. (2012-2013). Post-doc Associate, Wright State University.
24. Tzu-Ting Sun, B.S. (2012). Research assistant, Wright State University.
25. Jacob Brewer, B.S. (2012-2013). NIH GRAD-PREP Fellow, Wright State University.
26. Amine Chellali, Ph.D. (2011-2013). Post-doc Associate, Tufts University/Cambridge Health Alliance Hospital.
27. Likun Zhang, M.S. (2010-2011). Research Associate, Tufts University.
28. Hua Xing, Ph.D. (2007). Post-doc Associate, Tufts University.

Supervisor of Graduate Students (43 total):

Ph.D. Students (Note: Tufts University does not have a Ph.D. program in HFE) (Total 5):

1. Allemang-Trivalle, A. (in progress). Automated assessment and intervention models for maximizing situation awareness in human-robot interaction. PhD in Engineering (COTUTELLE), IMT Atlantique, France & Max-Planck-Institute for Intelligent Systems, Germany.
2. Kassassi, C. (in progress). Social stress in virtual environments. PhD in Computer Science. IMT Atlantique.
3. Gulotta, C. (in progress). Virtual coach in critical decision making. PhD in Engineering, Wright State University.
4. Maddah, M. (2018). 3D Visualization & interactive image manipulation for surgical planning in robot-assisted surgery. Ph.D. in Engineering (COTUTELLE), Wright State University & Ecole des Mines de Nantes, France. September 2018.
5. Zhou, Mi (2010). Haptics in laparoscopic remote manipulation. Ph.D. in Mechanical Engineering, Tufts University, May 2010.

M.S. Thesis Students (Total 31):

6. Wilcox, K. (in progress). Effects of stochastic resonance on haptic sensitivity. MS in Electrical Engineering, Wright State University.
7. Lechappe, Aurelien (2020). Situation awareness assessment using multimodal data. MS in Psychology, Universite de Bretagne Occidentale, France.
8. Goswami, T. (2019). Chondroitin sulfate hydrogels for total wound care devices. MS thesis in Biomedical Engineering, Wright State University. December 2019.
9. Rinehart, B. (2016). Design and evaluation of a fiber optic shape tracker for use as a navigational aid in endovascular guidewires and catheters. MS thesis in Biomedical Engineering, Wright State University. May 2016.
10. Hoskins, R. (2015). Use of vibrotactile feedback and stochastic resonance for improving laparoscopic surgery performance. MS thesis in Human Factors Engineering, Wright State University. May 2015.
11. Banez, J. (2012). Port-placement optimisation in robotic surgery. MS thesis in Human Factors Engineering, Tufts University, August 2012.
12. Cunningham, S. (2012). Team communication in robotic surgery. MS thesis in Human Factors Engineering, Tufts University, May 2012.
13. Roth, E. (2010). European Masters on Advanced Robotics (EMARO), Institut de Recherche en Communications et Cybernétique de Nantes, Nantes, France, August 2011.
14. Wong, C. (2010). Psychophysics test apparatus for haptics. European Masters on Advanced Robotics (EMARO), Institut de Recherche en Communications et Cybernétique de Nantes, Nantes, France, August 2010.
15. Takac, B. (2010). Haptic communication. European Masters on Advanced Robotics (EMARO), Institut de Recherche en Communications et Cybernétique de Nantes, Nantes, France, August 2010.
16. Zhang, Likun (2010). Visuomotor congruency in laparoscopic surgery. M.S. thesis in Human Factors, Tufts University, May 2010.
17. Eisenstein, Jessica (2010). Development and preliminary evaluation of a fibre optic bend sensor using CMOS imaging technique. M.S. thesis in Mechanical Engineering. Tufts University, May 2010.
18. Gavalis, Robb (2009). Multi-axis optical-fiber bend sensor for colonoscopy guidance. MS thesis in Mechanical Engineering, Tufts University, May 2009.
19. Bell, Audrey (2008). Evaluation of rotational frequency modulation for force feedback delivery in

- laparoscopic tissue differentiation tasks. M.S. thesis in Mechanical Engineering, Tufts University, November 2008.
20. Nodine, E. (2008). Detection of drowsy drivers through driver performance indicators. M.S. thesis in Human Factors, Tufts University, August 2008.
 21. Dill, Meredith (2007). Treatment of optical fibres for curvature measurements. M.S. thesis in Human Factors, Tufts University.
 22. Slutsky, Fran (2007). Confusion in auditory alarms in everyday products. M.S. thesis in Human Factors, Tufts University.
 23. Schoonmaker, Ryan (2006). Vibrotactile stimulation and force feedback in laparoscopic surgery. M.S. thesis in Mechanical Engineering, Tufts University, May 2006.
 24. Shimotsu, Ryan (2006). Enhancing depth perception with coloured shadows. M.S. thesis in Biomedical Engineering, Tufts University, May 2006.
 25. Goble, Jess (2005). Design of logging tool for behaviour modification. M.S. thesis in Human Factors, Tufts University, December 2005.
 26. Huang, Brian (2005). Enhancing the layout of graphically presented browsing history with implicit spatial and temporal knowledge. M.S. thesis in Human Factors, Tufts University, February 2005.
 27. Fletcher, Martha (2004). Assessment of cognitive loading attributed to encapsulation by headgear. M.S. thesis in Human Factors, Tufts University, August 2004.
 28. Perreault, Jesse (2004). Effects of friction on haptic perception in simulated endoscopic environments. M.S. thesis in Human Factors, Tufts University, August 2004.
 29. Webster, Jessica (2004). Introducing a robotic surgical system in the operation room: effects on communication flow and attentional resources. M.S. thesis in Human Factors, Tufts University, August 2004.
 30. Scherpa, Josef (2003). The effects of texture and 3D graphic representations on human performance using touchscreen interfaces. M.S. thesis in Human Factors, Tufts University, August 2003.
 31. Fabian, Steve (2002). Evaluation of Three Model Predictions of Alertness. M.S. thesis in Human Factors, Tufts University, May 2002.
 32. Rivera, Cristina (ABD). Task analysis of NOTES (natural orifice transluminal endoscopic surgery). M.S. thesis in Human Factors, Tufts University.
 33. Hall, Jason (ABD). Analysis of fixations in team decision making in the OR. M.S. thesis in Human Factors, Tufts University.
 34. O'Connor, Ashling (ABD). Knowledge of results in surgical skills acquisition. M.S. thesis in Human Factors, Tufts University.
 35. Waxberg, Sara (ABD). Modelling training and success of surgical residents at Tufts-New England Medical Centre. M.S. thesis in Human Factors, Tufts University.
 36. Friedberg, Leah (ABD). Postural stress in surgeons. M.S. thesis in Human Factors, Tufts University.

M.S. (Non-Thesis) Students (7 total):

37. Topolski, C. (2020). MS in Human Factors Engineering, Wright State University.
38. Mensah, A. (2018). MS in Biomedical Engineering, Wright State University.
39. Pinon, N. (2017). ME Industrial & Human Factors Engineering, Wright State University.
40. Hamdan, M. (2017). ME in Biomedical Engineering, Wright State University.
41. Diller, E. (2016). ME in Biomedical Engineering, Wright State University.
42. Spindler, D. (2015). ME in Industrial & Human Factors Engineering. Wright State University.
43. Lou, Y. (2014). ME in Industrial & Human Factors Engineering, Wright State University.

Supervisor of Undergrad Honors Theses (8 total):

1. Steimle, T. (2021). Engineering design of fixture for fabrication of fibre optic shape sensors. BS honours in Mechanical Engineering, Wright State University.
2. Axiopoulou, A. (2021). Task analysis of robotic hysterectomy. BS honours in Neuroscience, Wright State University.
3. Topolski, Chloe (2019). Trust in Robotic Surgery. BS honours in Biomedical Engineering, Wright State University.

4. Greenwald, Daniel (2008). Haptics in MIS during levering actions. B.A. honours in Psychology, Tufts University, May 2008.
5. Hamada, Kristi (2004). *Human factors and children: Designing an interface for an interactive kinetic sculpture*. B.S. honours thesis in Human Factors, Tufts University, May 2004.
6. Waxberg, Sara (2004). *The effects of video game experience on laparoscopic skill acquisition*. B.S. honours thesis in Human Factors, Tufts University, May 2004.
7. Basford, Eric (2003). *The application and interface of the tube-crawling robot: A human factors approach*. B.S. honours thesis in Human Factors, Tufts University, May 2003.
8. Cades, David (2003). *Target detection in robotic colonoscopy*. B.A. honours thesis in Human Factors, Tufts University, May 2003.

Committee Member of Undergraduate Theses (10 total):

1. Wong, Daniel (2009). Modal specific context varies discourse self-relevance and narrative simulations. B.A. in Psychology, Tufts University, May 2009.
2. Pergakis, Melissa (2007). Spatial reference frames in spatial memory. B.A. in Psychology, Tufts University, May 2007.
3. Zigelbaum, Jamie (2006). B.S. in Human-Computer Interaction. Tufts University, May 2006.
4. Parent, Daniel P. (2003). *The forensic crashworthiness analysis of the Placentia, CA rail collision*. B.S. honours thesis in Mechanical Engineering, Tufts University, May 2003.
5. DeLuca, Diana (2003). *Robotics and education: teaching with technology*. B.A. honours thesis in Child Development and Education, Tufts University, May 2003.
6. Hacker, Laura (2003). *Robotics in education: ROBOLAB and robotic technology as tools for learning science and engineering*. B.A. honours thesis in Child Development and Education, Tufts University, May 2003.
7. Nodine, Emily (2003). *Kinematic design and analysis of a laparoscopic surgical assist device*. B.S. in Mechanical Engineering, WPI, December 2003.
8. Cohen, Jonathan (2004). B.A. honours thesis in Psychology, Tufts University, May 2004.
9. Sutphen, Adeline (2004). *A multidisciplinary team approach to the design and development of an autonomous mobile robot team*. B.S. honours thesis in Mechanical Engineering, Tufts University, May 2004.
10. Tang, Sandra (2004). *RoboHunt: A study of instructional strategies and the gender differences that arise in a robotics workshop*. B.A. honours thesis in Child Development and Education, Tufts University, May 2004.

Committee Member of Graduate Theses/Dissertations (16 total):

1. Mousa, M. (in progress). PhD in Engineering, Wright State University.
2. Davies, Christopher (2020). MS in Biomedical Engineering, Wright State University.
3. Epps, Justin (in progress). PhD in Neuroscience, Wright State University.
4. Hamandi, Farah (2020). Hierarchical structure, properties and bone mechanics at macro, micro and nano levels. PhD in Engineering, Wright State University.
5. Salih, Anmar (2019). Characterization of in-vivo damage in implantable cardiac devices and the lead residual properties. MS in Biomedical Engineering, Wright State University.
6. Whatley, Stephen (2019). Computational simulation of a femoral nail. MS in Biomedical Engineering, Wright State University.
7. Montgomery, Andrew (2018). *Novel auto-calibrating neural motor decoder for robust prosthetic control*. MS in Biomedical Engineering, Wright State University.
8. Gundapaneni, Dinesh (2017). *Computational simulations of biomechanical kinematics in WSU Total Ankle Replacement Systems*. Ph.D. in Engineering, Wright State University.
9. Wang, Shuai (2017). *Models and methodology for optimal financial aid allocation for a state university*. Ph.D. in Engineering, Wright State University.
10. Zhao, C. (2015). *AE-SIFT: An autoencoder-based image descriptor for image matching and retrieval*. PhD in Computer Science and Engineering, Wright State University, December 2015.

11. Brunye, Tad (2004). *Multimedia presentations as effective tools for learning procedural assembly sequences*. M.A. in Psychology, Tufts University, May 2004.
12. Spataro, Joseph E. (2004). *Evaluation of surgical blade cutting forces*. M.S. in Mechanical Engineering, Tufts University, August 2004.
13. Gemmill, Benjamin (2005). *Design and construction of a physically controlled, online, persistent 3D world*. M.S. in Mechanical Engineering, Tufts University, August 2005.
14. Mason, Paul (2005). *The development of Robotable: A hands-on tabletop environment to support engineering education*. M.Sc. in Human Factors, Tufts University, August 2005.
15. Bilge, Reyyan (2005). *Learning nested environments from maps: Is spatial updating simultaneous?* M.A. in Psychology, Tufts University, March 2005.
16. Afram, Andrew (2005). *Evaluation of semantic fisheye zooming for navigating concept maps*. M.S. in Human Factors, Tufts University, April 2005.

Supervisor of Special Projects (49 total):

1. Aggarwal, A., Philip, P., Yeary, L., Asman, C. (2021). Development of a phantom model for endovascular tool evaluation. Senior Design Project, Biomedical Engineering, Wright State University.
2. Combs, K., Adkins-lamb, G., Sebastian, S., Nachbauer, A. (2021). Development of cost model for revenue projection in endovascular devices. Senior Design Project, Industrial and Systems Engineering, Wright State University.
3. Ben-Tolila, E. & Hainaut, A. (2020). SR in haptic perception. Research track project, DAPI, IMT Atlantique, Nantes, France.
4. Grieve, L.D., Tireau, E., Sevellec, E., Yu, T. (2020). AI in robotic surgery. Research track final year project, DAPI, IMT Atlantique, Nantes, France.
5. Hoang et al. (2019). Intracranial pressure waveform generator for traumatic brain injury simulation. Senior Design Project, Biomedical Engineering, Wright State University.
6. Guay et al. (2017). Design of eyeblink conditioning apparatus. Senior Design Project, Biomedical Engineering, Wright State University.
7. Pinion, N. (2016). Effect of haptics on trust in human-machine interaction. Human Factors Engineering Undergraduate Research, Wright State University.
8. Mohler et al. (2015). Design and testing of sensorised endovascular guidewires. Senior Design Project, Biomedical Engineering, Wright State University.
9. Campbell et al. (2014). Force measurement in flexible endoscopy. Senior Design Project, Biomedical Engineering, Wright State University.
10. Millar et al. (2014). ICG imaging. Senior Design Project, Biomedical Engineering, Wright State University.
11. Allen, J., Diller, E., Merrell, T., Reinhart, B. (2013). Instrumented glove for force measurements in medical device manipulation. Senior Design Project, Biomedical Engineering, Wright State University.
12. Luu, D. (2013). Haptic sensation replication in contralateral limbs. Australian e-Health Research Centre, The Commonwealth Scientific and Industrial Research Organisation (CSIRO).
13. Jarusiewicz, S., Iman (2012-2013). Water filtration system for third world countries. Senior Design Project, Biomedical Engineering, Wright State University.
14. Davis, E., Grosdemouge, C., Linsalata, R., Morowsky, K., Noble, J., San, C., Seng, A., Ventalon, L. (2012). International Project on Telemedicine Design and Control. Joint international project between Tufts University and Ecole des Mines de Nantes (Projet en Contexte Internationale).
15. Banez, J., Cunningham, S., Kwinn, C., Napal, V., Pham-Le, C., Six, A., Taylor-Brown, P. (2011). An innovative and collaborative approach to learning telesurgery concepts. Joint international project between Tufts University and Ecole des Mines de Nantes (Projet en Contexte Internationale).
16. Grosdemouge, C. (2010). Measuring human haptic perception thresholds. Summer Intern, Institut de Recherche en Communications et Cybernétique de Nantes (UMR CNRS 6597), Nantes, France.
17. Luu, D. (2010). Design and development of robotic arm prototype for needle insertion. Summer Intern, Ecole des Mines de Nantes, France.
18. Eyzat, L. & Ngabe, G. (2009). Fibre optics guidance automation. French International Visiting Scholars.
19. Chan, L. (2009). Endoscopic shape tracking. NSF-REU Fellow.
20. Miller, A. (2009). Dynamic laparoscopic skills simulator. NSF-REU Fellow.

21. Potts, J. (2008). Evaluation of elbow external fixators. NIH BREEM Fellow.
22. Bader, D. (2008). Design of cylindrical fixture for optical fibre bending. NIH BREEM Fellow.
23. Greenwald, D. (2008). Haptic perception in minimally invasive surgical tasks: An investigation of tumour detection. BA Honours Thesis in Psychology, Tufts University.
24. Taylor, D., Lui, J., Chen, J., Knowles, M., LeBlanc, S. (2008). Design of 3D virtual haptic system for surgical training. COMP 190 senior project in Computer Science, Tufts University.
25. Johnston, L. & Lokhande, K. (2007). Information display in the OR. NSF-CUSP Fellows.
26. Zamarripa, N. (2007). Design of micro fixture for fibre preparation. NSF-REU Fellow.
27. Mandelupe, E. (2007). Design of next generation haptic devices for MIS. NIH BREEM/NSF-REU Fellow.
28. Maxwell, Kyle (2007). Deformable surfaces in VR environments for MIS training. NSF-REU Fellow.
29. Dennis, D. (2006). Generating haptic events using the Phantom. NSF-CUSP Fellow.
30. Eaton, C. (2006). Investigation of haptics in a virtual endoscopic environment. NSF-CUSP Fellow.
31. Bell, A. (2006). Effect of magnified haptics on control of force application in MIS. NSF-REU Fellow.
32. Johanas, J. (2006). Effect of haptics on depth perception in MIS. NSF-REU Fellow.
33. Meng, J. & Wu, D. (2005). ARMISTS: Augmented reality in MIS training system. Special Project, CS352 Human-Computer Interaction, Computer Science, Vanderbilt University.
34. Bell, A., Johanas, J., Saide, M. (2005). Dynamic surgery simulator. Senior Design Project, Mechanical Engineering, Tufts University.
35. Abbott, Rebecca (2005). Automation of FLS scoring for mesh-cutting task. B.Sc. in Mechanical Engineering, Tufts University.
36. Nguen, Tuan (2005). Haptic perception in laparoscopic surgery for residents. First year medical student. Tufts Medical School.
37. Laurel Vuong (2005). Performance metrics in surgical skills learning. First year medical student. Tufts Medical School.
38. Kalafarski, Edward (2005). Design of dynamic task in surgical simulation. B.Sc. in Computer Science, Tufts University.
39. Butler, Kristen (2005). Robotics Academy: Genetic Line Sorting Optimisation. Senior Project. B.Sc. in Human Factors Engineering, Tufts University.
40. Gaulin, Mathieu (2005). Design of Learning Aids for Novice Surgeons in MIS. Special Project. B.Sc. in Psychology, Tufts University.
41. Khawati, Nadia (2004). Analogue vs. Digital Force Displays. NSF-REU Fellow.
42. Emily Finn, Chris Papazian, Ed Schwehm, Tion Thomas, Bryan Warner. Flexible Virtual Environment. COMP 190 Senior Design Project, Computer Science, Tufts University.
43. Kogan, Anna (2004). Visuomotor coordination in endoscopic surgery. B.Sc. in Mechanical Engineering, Tufts University.
44. Waxberg, Sara & Park, Brian (2003). Surgical training using real and virtual models. NSF-REU fellows.
45. Nodine, Emily (2003). Design of endoscopic camera holder. Senior Design Project, Mechanical Engineering, WPI.
46. Iny, Mandy & Waxberg, Sara (2003). Task analysis of robotic surgery. B.Sc. in Human Factors Engineering, Tufts University.
47. Ono, Mamiko & Chan, Melissa (2003). Navigational aid display. B.Sc. in Human Factors Engineering, Tufts University.
48. Fisher, Jennifer & Marshall, Kate (2002). Verbal protocol analysis. B.Sc. in Human Factors Engineering, Tufts University.
49. Dombach, M., Schrauth, A.J., Parent, D., Adrian, J., Wilson, A. (2003). Design of robotic colonoscope. Robotics Academy, Mechanical Engineering, and Electrical Engineering and Computer Science, Tufts University.

External Examiner of Habilitation and PhD Dissertations (6 total):

1. Michel, Guillaume (2021). Etude d'un robot d'assistance pour la chirurgie endoscopique otologique et sinusienne. Ecole doctorale No. 602 Sciences pour l'Ingenieur, Specialite Robotique-Mecanique, l'Ecole Centrale de Nantes. July 7, 2021. (Presidente du Jury)

2. Ricci, A. (2020). Study of simulator fidelity in immersive virtual reality trainers for technical surgical skills. Ph.D. in Computer Science, Universite Paris-Saclay, Ecole doctorale no. 580, Sciences et Technologies de l'Information et de la Communication (STIC), December 9, 2020.
3. Giannopulu, Irini (2011). Contribution a la comprehension des representations multimodales chez l'homme sain et chez les patients avec atteinte neuropsychologique: une perspective "life span". L'Habilitation a Diriger des Recherches (HDR), Universite Pierre & Marie Curie – Paris 6, January 2011.
4. Chellali, Amine (2009). Etude des interactions homme-homme pour l'elaboration du referential commun dans les environnements virtuels collaboratifs. Ph.D. in Informatique et applications (automatique et informatique appliques), Universite de Nantes, UFR Sciences et Techniques, December 2009.
5. Poor, Michael (2008). The effects of varying levels of reality based interaction styles on a subjects ability to perform a 3D construction task. Ph.D. in Computer Science, Tufts University, 2008.
6. Christou, Georgios (2007). A knowledge-based framework for the description and evaluation of reality-based interaction. Ph.D. in Computer Science, Tufts University, 2007.

Honors Achieved by Students

1. DAGSI Best Poster Award (Master's Division), September 2019.
2. SPIE Optics and Photonics Education Scholarship, July 2015.
3. Outstanding Graduate Student Award, WSU College of Engineering and Computer Science, May 2015.
4. First Prize Research Division, DAGMEC Research Symposium, Dayton, OH, 2013.
5. Graduate Student Research Award, Tufts University Graduate School of Arts & Sciences, 2011.
6. Best Presentation Award, New England Chapter Human Factors and Ergonomics Society, 2011.
7. Health Care Technical Group Best Student Paper Prize, Human Factors and Ergonomics Society (HFES) Annual Conference, 2009.
8. Outstanding Graduate Researcher, Department of Mechanical Engineering, Tufts University, 2009.
9. Best Poster Award, Society of American Gastrointestinal Endoscopic Surgeons (SAGES), 2009.
10. Best Poster Award, 2nd Place, Biomedical Devices Division, ASME, 2008.
11. Poster with Distinction Award, Society of American Gastrointestinal Endoscopic Surgeons (SAGES), 2007.
12. Health Care Technical Group Best Student Paper Prize, Human Factors and Ergonomics Society (HFES) Annual Conference, 2006.
13. Third Place Best Paper Prize, Surgical Resident Research Day at T-New England Medical Centre, 2006.
14. Poster with Distinction Award, Society of American Gastrointestinal Endoscopic Surgeons (SAGES), 2006.
15. Best Presentation Award, New England Chapter of Human Factors and Ergonomics Society, 2005.
16. Best Presentation Award, New England Chapter of Human Factors and Ergonomics Society, 2005.
17. Best Teaching Assistant Award, Department of Mechanical Engineering, Tufts University, 2005.
18. Graduate Student Research Award, Tufts University Graduate School of Arts & Sciences, January 2003.
19. Graduate Student Research Award, Tufts University Graduate School of Arts & Sciences, January 2003.
20. Best Research Assistant Award, Department of Mechanical Engineering, Tufts University, 2002.