

Michael A. Kokko

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Education

- Ph.D. Engineering Science. Thayer School of Engineering at Dartmouth College. **Expected 2021.**
 Advisors: Douglas W. Van Citters, PhD and Ryan J. Halter, PhD
 Thesis topic: "A Framework for Navigated Organ Exposure in Robotic Laparoscopy"
- S.M. Mechanical Engineering. Massachusetts Institute of Technology, 2007.
 Thesis: "Range-based Navigation of AUVs Operating Near Ship Hulls"
 Advisors: John J. Leonard, PhD and Franz S. Hover, PhD
- B.S. Mechanical Engineering. Rensselaer Polytechnic Institute, 2005.

Professional Experience

- Graduate Research Assistant – Thayer School of Engineering, Dartmouth College – Hanover, NH 2016 – present
- Sr. Systems Integration Engineer – Simbex, LLC. – Lebanon, NH 2011 – 2016
- Robotics Engineer – Vecna Technologies – Cambridge, MA 2007 – 2011
- Graduate Research Assistant – MIT Marine Robotics Laboratory – Cambridge, MA 2005 – 2007
- Undergraduate Researcher – RPI Flexible Manufacturing Center – Troy, NY 2003 – 2005

Teaching Experience

- **Lecturer** – Dartmouth ENGS 72 Dynamics (Primary instructor, reworked and delivered all 34 lectures) Fall 2019
- Lead Teaching Assistant – Dartmouth ENGS 72 Dynamics (Ran problem sessions, delivered 4 lectures) Fall 2018
- Lead Teaching Assistant – Dartmouth ENGS 72 Dynamics (Ran problem sessions, delivered 5 lectures) Fall 2017
- Lead Teaching Assistant – Dartmouth ENGS 72 Dynamics (Ran problem sessions, delivered 3 lectures) Fall 2016

Academic Talks and Invited Classroom Lectures

- "Navigating in the Abdomen." Dartmouth Engineering in Medicine Lecture Series. January 11, 2019.
- "Racing Against Bacteria: An Engineering Perspective on Infection." Dartmouth ENGS 165. Spring 2018-2020
- "Pushing the Limit (Cycle): Nonlinear Dynamics and Limit Cycle Analysis in Biomedical Engineering." Dartmouth Engineering in Medicine Lecture Series. December 1, 2017.
- "How Good Is My Diagnostic Test?" Dartmouth Engineering In Medicine Lecture Series. April 28, 2017.
- "Medicare and Medical Devices." Dartmouth ELEC 178 Medical Device Design Elective. April 11, 2017.
- "Considerations for Developing Medical Devices." Dartmouth ENGS 57/169. April 9, 2015.

Awards and Honors

- Citations for superior teaching assistant performance (Dartmouth ENGS 72 Applied Dynamics) 2016, 2017, 2018
- Outstanding Poster Award - Dartmouth Graduate Student Poster Session 2018
- Arthur M. Greene Prize – Rensselaer Polytechnic Institute 2005
- 4.0 Certificate – Rensselaer Polytechnic Institute 2005
- Founders' Award – Rensselaer Polytechnic Institute 2003
- Rensselaer Medal Scholarship 2001

Service

- Volunteer Appalachian Trail Boundary Monitor (section of Kodak Trail on Mt. Cube, Orford, NH) 2018 – present
- Reviewer for [TREAT](#) (NIH funded) and [NEPDC](#) (FDA funded) technology commercialization grants 2014 – 2019
- Emergency Department Volunteer – Dartmouth-Hitchcock Medical Center (~3hrs/wk, year-round) 2011 – 2016

- Winter School Trip Leader – MIT Outing Club 2005 – 2014
- FIRST Robotics Mentor – Cambridge Rindge and Latin School 2005

Mentorship and Advising

- Sophomore Scholar Mentor: Joselyn Lopez RALPN phantom development 2020
- ENGS 89/90 Senior Capstone Advisor: Drone-based cremains dispersal mechanism 2019 – 2020
- ENGS 89/90 Senior Capstone Advisor: Drone-based microplate transport gripper 2019 – 2020
- Simbex Co-op Mentor: Conor McKaig (RIT); medical mattress valve replacement and system testing 2015
- Simbex Co-op Mentor: Linzey Miller (RIT); helmet sensor durability, IMU evaluation 2014
- Simbex Co-op Mentor: Mireille Kelley (UConn); blast dosimeter fitting, reflex air cannon 2013
- Simbex Co-op Mentor: Jon Roth (Cornell); helmet sensor characterization 2012

Patents

- Two patents pending on technologies for pressure-reducing medical support surfaces (Simbex) 2019
- US 8739820 B1 “Pressure Relief Valve” (with Daniel Theobald, Vecna Technologies) 2014

Professional Society Memberships

- American Society for Engineering Education (ASEE), Student Member 2019 – present
- International Society for Optics and Photonics (SPIE), Student Member 2018 – present
- Orthopedic Research Society (ORS), Student Member 2018
- Institute for Electrical and Electronic Engineers (IEEE), Student Member (EMBS, RAS) 2016 – present
- ANSI/RESNA Support Surface Standards Initiative Committee (Representative of Simbex) 2014 – 2015

Grant Funding

- Norris Cotton Cancer Center Pilot Grant (\$50k). **Grant author.** PI: Ryan J. Halter. 2018 – 2020
“Anatomical Modeling for Real-Time Guidance in RALPN Organ Access”

Technical Skills

- Engineering team & project management: planning, execution, verification/validation, and delivery
- Mechanical system design involving electric and hydraulic actuation, power transmission, bearing selection, and seal design with emphasis on manufacturability and assembly
- Extensive knowledge of design software: SolidWorks, MATLAB/Octave, basic FEA and dynamic simulation
- Broad mechanical fabrication experience: precision manual milling and turning, CNC machining, welding and brazing; working knowledge of injection molding, rapid prototyping, industrial robotics, and metrology
- Electrical prototyping involving analog and digital circuit design, embedded system development, PCB layout, serial communication, and circuit analysis using oscilloscope and other standard test equipment
- System integration, wiring, and troubleshooting/resolution of electromechanical issues
- Embedded and object-oriented programming in C/C++ with knowledge of Java, Perl, and Python; adept at most general computing tasks under both Windows and Linux environments
- Professional communication including written and oral presentation of design information and analyses

Publications

- **Kokko MA** and Chapman RM. Gyroscope-Based Measurement of Tibia Coronal Alignment in Total Knee Arthroplasty. *In review.*

- **Kokko MA**, Abdel MP, Berry DJ, Butler RD, Van Citters DW. A retrieval analysis perspective on revision for infection. *Arthroplasty Today* 2019; 5(3), 359-367. doi: [10.1016/j.artd.2019.03.007](https://doi.org/10.1016/j.artd.2019.03.007)
- **Kokko MA**. Range-based navigation of AUVs operating near ship hulls. S.M. Thesis, Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, 2007. doi: [1721.1/40292](https://doi.org/10.1721.1/40292)

Conference Presentations and Proceedings

- **Kokko, MA**, Seigne JD, Van Citters DW, Halter RJ. Multi-body statistical shape representation of anatomy for navigation in Robot-Assisted Laparoscopic Partial Nephrectomy. SPIE Medical Imaging Symposium 2021. **Accepted as a podium presentation** at: SPIE Medical Imaging, 2021 Feb 14-28; San Diego, CA.
- **Kokko, MA**, Seigne JD, Van Citters DW, Halter RJ. Development of exposure phase navigation as a training aid in robotic surgery. **Poster presentation** at: National Image Guided Therapy Virtual Workshop, 2020 Apr 16; Rockville, MD. Recording available: <https://youtu.be/sg3ytCMeHP0>
- **Kokko, MA**, Seigne JD, Van Citters DW, Halter RJ. Modeling the surgical exposure of anatomy in robot-assisted laparoscopic partial nephrectomy. SPIE Medical Imaging Symposium 2020. **Podium presentation** at: SPIE Medical Imaging, 2020 Feb 15-20; Houston, TX. doi: [10.1117/12.2550605](https://doi.org/10.1117/12.2550605)
- **Kokko MA**, Seigne JD, Van Citters DW, Halter RJ. Toward a framework for navigational guidance during surgical access. SPIE Medical Imaging Symposium 2019. **Poster presentation** at: SPIE Medical Imaging, 2019 Feb 16-21; San Diego, CA. doi: [10.1117/12.2513040](https://doi.org/10.1117/12.2513040)
- **Kokko MA**, Abdel MP, Berry DJ, Butler RD, Van Citters DW. When does PJI strike? A retrieval analysis perspective. **Podium presentation** at: Orthopedic Research Society annual meeting; 2018 Mar 10-13; New Orleans, LA.
- **Kokko MA**, Halter RJ, Van Citters DW. Bioimpedance of synovial fluid in a series of osteoarthritic knees. **Poster presentation** at: Orthopedic Research Society annual meeting; 2018 Mar 10-13; New Orleans, LA.
- Mayer LW, **Kokko MA**, Halter RJ, Van Citters, DW. Synthesis of an electrical analog for synovial fluid of the human knee. **Poster presentation** at: Orthopedic Research Society annual meeting; 2018 Mar 10-13; New Orleans, LA.
- **Kokko MA** and Hover FS. Estimating vehicle position using few range measurements to a known curved surface. *Field and Service Robotics: Results of the 6th International Conference*, C. Laugier and R. Siegwart, eds., pp. 223-232, Berlin, Heidelberg: Springer Berlin Heidelberg, 2008. **Podium presentation**. doi: [10.1007/978-3-540-75404-6_21](https://doi.org/10.1007/978-3-540-75404-6_21)
- Vaganay J, Elkins ML, Esposito D, Hover FS, **Kokko MA**. Ship Hull Inspection with the HAUV: US Navy and NATO Demonstrations Results. *OCEANS 2006*, Boston, MA, 2006, pp. 1-6. doi: [10.1109/OCEANS.2006.307039](https://doi.org/10.1109/OCEANS.2006.307039)

Other Workshops

- 2018 Hamlyn Winter School for Surgical Imaging and Vision. Imperial College London. 2018 DEC 02-08. **Participant**. Runner-up for best group project on deep learning to identify needles in ultrasound.