

Matthew J. Gerber, PhD

Postdoctoral Researcher

gerber211@ucla.edu

+1 (614) 477-8504

MatthewJGerber.com

EDUCATION

- 2019 **Ph.D. in Mechanical Engineering**, University of California, Los Angeles (UCLA), California, USA
2014 **B.S. & M.S. in Mechanical Engineering**, The Ohio State University (OSU), Columbus, Ohio, USA
2007 **B.A. in Japanese & B.S.D. in Graphic Design**, The Ohio State University (OSU), Columbus, Ohio, USA

EXPERIENCE

- Jan. 2020 – Present **Postdoctoral Researcher**, Advanced Robotic Eye Surgery Laboratory (UCLA)
- Conceived and demonstrated a fully autonomous robotic surgical system for microvascular cannulation with 20 μm precision and guided by Optical Coherence Tomography (OCT) image feedback
 - Demonstrated the world's first fully autonomous posterior capsule polishing procedure on harvested pig eyes with *in situ* OCT feedback and control of surgical instrument vacuum/irrigation forces
 - Developed a deep-learning-based image-processing algorithm for generating intraoperative augmented-reality overlays of epiretinal membranes for surgical retinal membrane peeling
 - Authored 4 peer-reviewed journal publications and 3 patents
- Jan. 2016 – Jun. 2019 **Graduate Teaching Assistant (GTA)**, Department of Mechanical Engineering (UCLA)
- Taught senior undergraduate capstone design course on mechatronics, manufacturing, and design of autonomous mobile robots; developed projects, lectured, and facilitated group work
- Sep. 2015 – Dec. 2019 **Graduate Student Researcher (GSR)**, Mechatronics and Controls Laboratory (UCLA)
- Developed autonomous lens-extraction procedure on harvested pig eye models using Optical Coherence Tomography (OCT) image guidance and surgical robot
 - Conceived and prototyped a novel, over-actuated quadcopter with articulated gimbal-based propeller axes for full-authority thrust vectoring to enable 6 DOF position and attitude control
 - Authored 6 peer-reviewed journal papers and 8 patents
- Nov. 2007 – Jun. 2009 **Website Developer**, Information Architects, Inc. (Tokyo, Japan)
- Designed, programmed, and maintained several prominent European websites

HONORS & AWARDS

- Jun. 2021 JSEI Excellence in Research Award
May 2020 Outstanding PhD in Mechanical Engineering, UCLA School of Engineering
Jan. 2020 – Dec. 2020 T32 Training Grant, National Institutes of Health (NIH)
Aug. 2014 – Mar. 2015 First-year Graduate Student Research Fellowship, UCLA

SKILLS

- Language:** English (Native); Japanese (Beginner)
Robotics: Image-based guidance, PID control, multibody dynamics, trajectory planning
Programming: NI Labview & Realtime FPGA, Matlab/Simulink, C++/Qt
Manufacturing: Solidworks, Mastercam, Eagle (PCB design), Mori Seiki CNC Mill and Lathe
Other: LaTeX, HTML/CSS/PHP/MySQL, Adobe Photoshop/Illustrator