Kent K. Yamamoto

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EDUCATION

Ph.D., Mechanical Engineering, Duke University | Durham, North Carolina   *Aug. 2022 - Present*
- **Advisors:** Patrick Codd, M.D., Weston Ross, Ph.D.
- **Concentration:** Dynamics, Robotics, and Controls

B.S., Biomedical Engineering, Georgia Institute of Technology (Georgia Tech) | Atlanta, Georgia   *May 2021*
- **Advisor:** Jaydev P. Desai, Ph.D.
- **Minor:** Robotics, Pre-Health

RESEARCH

Brain Tool Lab, Advisors: Patrick J. Codd, Weston Ross   *Aug. 2022 – Present*
TAST Fellow, Graduate Research Assistant – Duke University
- Modeling and synthesizing mechanically, thermally, and geometrically tunable phantom models of the brain
- Improving TumorCNC system for real-time spectral tumor classification and surgical laser ablation
- Exploring robotic surgical laser uses for dermatology applications

Medical Robotics and Automation (RoboMed) Lab, Advisor: Jaydev P. Desai.   *July 2021 – July 2022*
Staff Research Supporter - Georgia Institute of Technology
- Utilized femtosecond laser to machine meso-scale, tendon-driven, steerable surgical robots
- Machined, assembled, and evaluated 2-mm tendon-actuated steerable surgical graspers
- Created flexible, CT-derived, 3D printable phantom models of the human heart
- Conducted surgical simulation with neurosurgeons for preclinical evaluation of neuroendoscopic robot

Medical Robotics and Automation (RoboMed) Lab, Advisor: Jaydev P. Desai   *May 2018 – May 2021*
PURA Scholar, Petit Scholar - Georgia Institute of Technology
- Implemented medical imaging software to create phantom models of the pediatric skull and brain for robotic device testing
- Designed meso-scale bipolar electrocautery tooltip for neuroendoscopic robot
- Wrote IRB protocol for neurosurgical device testing
- Collaborated with neurosurgeons and shadowed surgeries to integrate observations into my research project

Bio-Interfaced Translational Nanoengineering Group, Advisor: W. Hong Yeo   *Dec. 2017 – July 2018*
Vertically Integrated Projects (VIP) Researcher - Georgia Institute of Technology
- Aerosol-jet printed flexible, skin-conforming electrode sensors
- Designed and programmed a robotic arm controlled by electrooculography and electroencephalography signals
- Implemented fundamental digital signal processing and machine learning in MATLAB

PUBLICATIONS

1. Y. Chitalia, S. Jeong (co-first author), **K. K. Yamamoto,** J. J. Chern, J.P. Desai, "Modeling and Control of a Meso-scale Multi-Joint Continuum Robot for Pediatric Neurosurgery," in *IEEE Transactions on Robotics,* 2021 Apr, DOI: 10.1109/TRO.2020.3031270 (Link)

CONFERENCE PROCEEDINGS

1. T.A. Brumfiel, **K.K. Yamamoto**, A. Rashid, A. Shigematsu, C. Chapman, S.N. Melkote, J.J. Chern, J.P. Desai*****, "Design of a Meso-Scale Grasper for Robotic Pediatric Neuroendoscope Tool", *Hamlyn Symposium on Medical Robotics,* 2022 Jun, London, UK (Link).
2. **K.K. Yamamoto***, J. P. Desai, "Pediatric Phantom Model and Cauterizing Tool Design for Novel Neuroendoscopic Surgical Robot Evaluation," *Georgia Tech Undergraduate Research Spring Symposium*, 2021 Apr, Atlanta, GA.
3. Y. Chitalia*, **K. K. Yamamoto***, J.P. Desai, "Design Development, and Evaluation of a Flexible and Steerable Robotic Monopolar Electrocautery Probe for Pediatric Neurosurgery," *CHOA Congressional Day*, 2019 Apr, Atlanta, GA.
4. **K. K. Yamamoto***, Y. Chitalia, S. Jeong, J. J. Chern, J.P. Desai, "Designing a Brain Phantom Model and Surgical Simulation System for Testing Surgical Robots," *Biomedical Engineering Society Annual Meeting*, 2019 Oct, Philadelphia, PA (Link).

*Denotes presenter

HONORS & AWARDS

NSF-NRT: Traineeship in the Advancement of Surgical Technologies (TAST) Program, Duke University **2022**

Winner - **Coronavirus Hackathon,** CommonVC *(virtual)* **2021**

President's Undergraduate Research (PURA) Awards, Georgia Tech Undergraduate Research Opportunities Program **2020**

Biomedical Engineering Department Travel Award, Georgia Tech Wallace H. Coulter Department of Biomedical Engineering **2019**

Petit Undergraduate Research Scholar, Parker H. Petit Institute of Bioengineering & Bioscience **2019**

TEACHING EXPERIENCE

STEM AP, SAT, ACT Tutor *June – Aug. 2022*

C2 Education Cumming, Georgia

- Improved high school students' standardized test scores
- Created student-tailored teaching schedules and strategies
- Inspired students to pursue higher education and STEM interests

Team Mentor *Aug. 2019 – May 2020*

FIRST LEGO League (FLL) team "Brain Waves" Irvine, California

- Mentored middle school team in design roadblocks and advanced MINDSTORMS programming
- Taught fundamental FLL skills such as robust design, line-following concepts, and presentation skills

Summer Instructor *May – August 2017*

iD Tech at UCLA Los Angeles, California

- Created curricula and taught engineering and robotics topics to students ages 9 to 18
- Instructed high school students on Arduino electronics, coding, and VEX Robotics

LEADERSHIP

Co-Founder, Advisor *July 2020 – July 2021*

Saku Mind Ltd. (Link) London, United Kingdom

- Collaborate with eight other Co-Founders from 6 different countries
- Facilitate concept discussions and contribute to high-level decision making
- Developed and published a new mental health app that connects wellness practices to nature and community

Undergraduate Research Ambassador *April 2020 – May 2021*

Undergraduate Research Opportunities Program Atlanta, Georgia

- Organized and led professional development workshops/events for Georgia Tech students
- Helped undergraduate students find the research experience they desired
- Promoted benefits of research experience among the undergraduate student population

ACTIVITIES

College Volunteer *Aug. 2018 – Apr. 2022*

Children's Healthcare of Atlanta Atlanta, Georgia

- Provided and engaged in craft activities with patients in the ICU wing
- Assisted sterilization staff with monitoring surgical tray inventory and cleaning
- Tutored patients who have missed school due to their hospital stay

Co-Founder, Co-President *Aug. 2017 – May 2021*

ATL Beatbox Atlanta, Georgia

- Co-managed Georgia's premier beatboxing organization and community
- Hosted annual international "Beatbox Legends Championships" with world-renown beatboxers as judges
- Performed for on-campus, professional, and charity events

SKILLS

Spoken Languages: English (Native), Japanese (Fluent), Mandarin (Elementary)

Instrumentation: Bovie Electrosurgical Generator, Form2, and Form3 Resin 3D printers, laser cutters, MakerBot 3D printers, NDI Aurora Electromagnetic Trackers, OPTEC Femtosecond Laser Micro-machining System, 3d Systems ProJet MJP 3D Printer

Software: Arduino, Autodesk Fusion 360, Blender, Eagle, MATLAB, Meshmixer, Simulink, Slicer3D, SolidWorks

Programming Languages: Arduino C, HTML, Java, MATLAB, Python, ROS