

Kent K. Yamamoto

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EDUCATION

Ph.D., Mechanical Engineering, Duke University | Durham, North Carolina

Aug. 2022 - Present

- **Advisors:** Dr. 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

- **Minor:** Robotics
- **Concentration:** 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
- Designing a 1-mm concentric tube robot with optical fiber for brain tumor boundary detection
- Testing and validating an endoscopic spectral sensor for brain tumor identification

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. N. J. Deaton T. A. Brumfiel, M. Sheft, **K. K. Yamamoto**, D. Elliott, P. Patel, J.P. Desai, "Towards Steering a High-Dose Rate Brachytherapy Needle with a Robotic Steerable Stylet," in *IEEE Transactions on Medical Robotics and Bionics*, doi: 10.1109/TMRB.2023.3237861. ([Link](#))
2. 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. R. Prakash, **K. K. Yamamoto**, S. Oca, W. Ross, P. Codd, "Brain-Mimicking Phantom for Photoablation and Visualization", *International Symposium on Medical Robotics*, 2023 April, Atlanta, GA, USA
2. 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](#)).
3. **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.
4. 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.

5. **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 (<i>virtual</i>)	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

VIP/Master Tutor (*virtual*) *Aug. 2022 - Present*
Chandler Learning Center Bedminster, New Jersey

- Helping students (6th - Undergrad) with various STEM topics
- Teaching standardized test strategies (SAT/ACT/AP/IB) high school students
- Assign student-tailored homework to help them reinforce and practice content

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

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