Alexander W. Kyu

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EDUCATION

Carnegie Mellon University, *Pittsburgh, NC* **August 2022 – August 2023**
Master of Human-Computer Interaction GPA: 4.0

North Carolina State University, *Raleigh, NC* **August 2017 – May 2022**
B.S. in Biomedical & Health Sciences Engineering (Joint w/ **UNC Chapel Hill**) GPA: 4.0
Minor in Computer Programming
University Honors Program; Dean's List Fall 2017-Spring 2022

Zhejiang University, *Hangzhou, China* **May 2018 – June 2018**
Study Abroad: China: Engineering, STS, and International Relations
Solid Mechanics Project with Caterpillar Inc.

SKILLS

- Programming Languages: Java, Matlab, C, C++, Arduino, Python, Unity
- ML Frameworks: Tensorflow, Keras
- 3D Modeling with Solidworks
- Worked with Basic Embedded Systems using Raspberry Pi, Arduino, and FRDM-KL25Z
- Experience with RESTful APIs and databasing with MongoDB and SQL
- Schematic and PCB Design with Eagle CAD and Altium
- Developed and validated test methods for testing commercial products
- Experience working with Github, SVN, and Bitbucket Repositories
- Experience with Agile, MKS Integrity, Arena, and JAMA Quality Management Systems
- CITI Certified

RELEVANT COURSE WORK

- Human Physiology for Engineers
- Bioinstrumentation
- Biocontrols
- Wearable Health Technologies
- SMASH Lab Independent Study
- User-Centered Research and Evaluation
- Programmable User Interfaces
- Machine Learning and Sensing
- Biomedical Signal Processing
- Data Structures and Algorithms
- C and Software Tools
- Operating Systems
- Neural Networks
- Computer Vision

PROFESSIONAL/TECHNICAL EXPERIENCE

UX Engineer at Bloomberg (MHCI Capstone), *NYC, NY* **Jan 2023 – Aug 2023**
- Designed and conducted interviews and user research activities with Bloomberg's customer support
- Facilitated Bloomberg stakeholder relations between product owners and UX research and design
- Synthesized and Presented research to various Bloomberg stakeholders to build empathy with users while pushing company goals
- Designing new workflows, services, and software for Bloomberg customer support in conjunction with product managers, engineers, and UX designers

Software Engineer at Intuitive Surgical, *Sunnyvale, CA* **May 2022 – Aug 2022**
- Designed and Improved Automated Testing Efforts for Language Support
- Automated Database Testing through UI Interactions
- Integrated moving 3D Model of Robotic System using React into an internal development tool
- Executed Software Protocols to ensure the quality of ISI's robotics for fda regulatory approval

Product Development Engineer at Asensus Surgical*, Durham, NC* **May 2021 – Aug 2021**
- Designed and Evaluated adapters to create compatibility between third-party endoscopes and the Senhance Surgical Robot
- Designed and Evaluated the Next Generation of Surgical Robotics using Solidworks
- Evaluated various ergonomics to improve the design of the surgeon interface
- Developed several test verification protocols for sterile drape compatibility with our devices
- Upgraded surgeon simulators to increase compatibility between the simulator and updated software on newer surgical systems

Software Engineer, System Test Co-op at Intuitive Surgical, *Raleigh, NC* **Jan 2020 – Dec 2020**

- Developing and Executing protocols to ensure quality of Intuitive Surgical's robotics
- Automating test protocols through Python script development
- Writing and reviewing Quality Management Reports for FDA regulatory approval
- Designed and Developed Backend Software Applications to improve testing analytics

Teaching Assistant for BME 201: Intro to MATLAB, *Raleigh, NC* **Aug 2019 – Dec 2019**

- Oversaw students during class labs and Reinforced the core concepts of programming in MATLAB
- Held and ran office hours to give guidance to students with MATLAB assignments
- Proctored exams and graded homework, labs, assignments, and tests

Technology Development Program Intern at Optum, *Raleigh, NC* **June 2019 – Aug 2019**

- Learned about healthcare through firsthand interviews with doctors and insurance providers
- Conducted market research on Shared Decision-Making in primary care and related Software
- Developed backend software, APIs, and databases managing healthcare and treatment data
- Created a novel Shared Decision-Making software service for providers and patients

RESEARCH EXPERIENCE

Researcher at CMU SMASH Lab (Independent Study), *Pittsburgh, PA* **Jan 2023 – Present**

- Evaluated past literature in the field of sensing for hand pose estimation
- Designed and Implementing a system to capture sensor data and hand pose data using EIT and computer vision
- Developing ML pipeline for offline and online training and hand pose estimation

Biomedical Researcher at CMU (Wearable Health Technologies), *Pittsburgh, PA* **Jan 2023 – May 2023**

- Evaluated past literature in the field of Joint kinematics and pose tracking in natural environments, state-estimation filters, and biomechanical modelling
- Developed and Executed experimental protocols to capture a variety of human movements and joint kinematics
- Implemented and Evaluated XSens imus across multiple state-estimation filters with and without biomechanical modelling (OpenSense)

Research Assistant for NCSU Advanced Wound Healing Lab, *Raleigh, NC* **Sept 2017 – Oct 2019**

- Characterized clot structure and other properties through microfluidic assay development
- Conducted general lab maintenance, protein purification, sample collection, plasma preparation, in vivo animal studies, and confocal image and data analysis
- Developed and Presented an Image Analysis Technique for fibrin clot quantification at the *2019 Annual BMES Conference* in Philadelphia, PA

Software Developer for the SenseNC Team at NCSU, *Raleigh, NC* **Nov 2018 – Aug 2019**

- Assisted in the development of a novel Biosensor to detect Adalimumab (Humira)
- Spearheaded Embedded Systems Software Development for our Biosensor Device
- Competed at the Annual International *SensUs Competition* against 14 other universities at The Eindhoven University of Technology in Eindhoven, Netherlands

University of North Carolina CH Young Innovators Program Intern, *Chapel Hill, NC* **Aug 2015 – Aug 2016**

- Designed and Executed an original research project on the clotting effects of Russell's Viper Venom
- Presented at a symposium on the results of the research to the Dean of Pharmacology, UNC professors, and other Interns

LEADERSHIP/SERVICE

President of Pack Bionics Team at NCSU, *Raleigh, NC* **Aug 2018 – Present**

- Managed relations between faculty, professors, and team members
- Planned and taught various topics to newer team members
- Evaluated various sensors and electronic components for their useability in a prosthetic leg
- Prepared a Schematic, Designed a PCB, and Ensured that it met manufacturing requirements
- Designed and Implemented the software controls and logic of the prosthetic using an FSM
- Developing a Neural Network controls-based approach for detecting user intention

- Preparing to compete in the international *Cybathlon* Competition in 2024 in the lower-leg prosthetic discipline

Internal Vice President of Lambda Phi Epsilon at NCSU*, Raleigh, NC* **Dec 2021 – Present**

- Managed internal relations between the brothers
- Assisted and Managed the organization of semesterly events around culture, academics, philanthropy, and social issues
- Worked with NC State University on event policy compliance
- Led internal discussions social issues relating to Sexual Assault and Misconduct, Alcohol and Drug Abuse, Food Scarcity and Improper Wealth Distribution, etc.

Publicity Chair of Lambda Phi Epsilon at NCSU*, Raleigh, NC* **Dec 2021 – Present**

- Managed the organization's social media pages, including Instagram and Facebook
- Designed graphics and organized a publication schedule for members to post
- Organized campaigns to increase awareness of both the chapter and around social issues
- Managed the organization's website by keeping it updated on events and important information

Academic Chair of Lambda Phi Epsilon at NCSU*, Raleigh, NC* **Aug 2021 – Dec 2021**

- Organized a workshop on Brand Enhancement specifically around having an online presence with an effective LinkedIn and a personal website
- Organized a workshop around graphics development for social media and brand enhancement purposes
- Worked with active members to improve/maintain a high GPA

PUBLICATIONS

- Nellenbach, KA, Kyu, A, Guzzetta, NA, Brown, AC. **Differential sialic acid content in adult and neonatal fibrinogen mediates differences in clot polymerization dynamics**. *Blood Advances.* 2021 Sep 23:bloodadvances.2021004417. doi: 10.1182/bloodadvances.2021004417.
- Nellenbach, KA, Nandi, S, Kyu, A, Sivadanam, S, Guzzetta, NA, Brown, AC. **Comparison of neonatal and adult fibrin clot properties between porcine and human plasma**. *Anesthesiology*. 2020;132(5):1091–1101. https://doi.org/10.1097/ALN.0000000000003165
- Nellenbach, K, Nandi, S, Peeler, C, Kyu, A, Brown, AC. **Neonatal Fibrin Scaffolds Promote Enhanced Cell Adhesion, Migration, and Wound Healing In Vivo Compared to Adult Fibrin Scaffolds.** *Cel. Mol. Bioeng.* (2020). https://doi.org/10.1007/s12195-020-00620-5

PROVISIONAL PATENTS

- **O24U Oxygen Concentrator Retractable Spool,** Provisional Patent Filed # 61749279 **Jan 2013**
- **Bacto-Free Indicator Bag,** Provisional Patent Filed #61586037 **Jan 2012**
- **Hemo-Electric Powered Pacemaker,** Provisional Patent Filed # 61437300 **Jan 2011**

AWARDS

- **Grand Challenge Scholar**: Learning and doing research and activities related to solving the NAE Grand Challenge of Health Informatics
- **Abrams Scholar Award 2018**: Designed and Executed a research project to better understand clotting differences between adults and neonates
- **Moody's Mega Math Challenge Scholarship 2017**: Analyzed and Mathematically Modelled the effects of sea level rise on National Parks
- **Magellan Science Outstanding College Mentor and Honorarium Award 2017**: Mentored World Class Middle School Lego Robotics Teams (2013-2017)