

Alexander W. Kyu

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EDUCATION

Carnegie Mellon University, Pittsburgh, NC	Expected Graduation 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
- 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
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- 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
- Computer Vision

PROFESSIONAL/TECHNICAL EXPERIENCE

UX Engineer at Bloomberg (MHCI Capstone), NYC, NY	Jan 2023 – Present
<ul style="list-style-type: none">• 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
<ul style="list-style-type: none">• 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
<ul style="list-style-type: none">• 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 *Cyathlon* 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)