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## EDUCATION

<b>Carnegie Mellon University, Pittsburgh, PA</b>	<b>August 2022 – August 2023</b>
Master of Human-Computer Interaction – School of Computer Science	GPA: 4.0
<b>North Carolina State University, Raleigh, NC</b>	<b>August 2017 – May 2022</b>
B.S. in Biomedical & Health Sciences Engineering (Joint w/ <b>UNC Chapel Hill</b> )	GPA: 4.0
Minor in Computer Programming	
University Honors Program; Dean's List Fall 2017-Spring 2022	
<b>Zhejiang University, Hangzhou, China</b>	<b>May 2018 – June 2018</b>
Study Abroad: China: Engineering, STS, and International Relations	
Solid Mechanics Project with Caterpillar Inc.	

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## SKILLS

- Programming Languages: Python, Java, Matlab, C, C++, C#, Unity
- ML Frameworks: Tensorflow, Keras
- Embedded Deep Learning using Edge TPUs like Google's Coral TPU
- Experience with RESTful APIs and database management with MongoDB and SQL
- V&V product testing
- Experience working with Github, SVN, and Bitbucket Repositories
- Experience with Agile, MKS Integrity, Arena, and JAMA Quality Management Systems

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## RELEVANT COURSE WORK

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|----------------------------------|---|
| • Neural Networks                | • Programmable User Interfaces          |
| • Computer Vision                | • Wearable Health Technologies          |
| • Machine Learning and Sensing   | • SmaSH Lab Independent Study           |
| • Biomedical Signal Processing   | • User-Centered Research and Evaluation |
| • Data Structures and Algorithms | • Bioinstrumentation                    |
| • C and Software Tools           | • Biocontrols                           |
| • Operating Systems              | • Rehabilitation Robotics               |

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## PROFESSIONAL/TECHNICAL EXPERIENCE

<b>UX Engineer at Bloomberg (MHCI Capstone), NYC, NY</b>	<b>Jan 2023 – Aug 2023</b>
<ul style="list-style-type: none"><li>• Designed and conducted interviews and user research activities with Bloomberg's customer support</li><li>• Facilitated Bloomberg stakeholder relations between product owners and UX research and design</li><li>• Synthesized and Presented research to various Bloomberg stakeholders to build empathy with users while pushing company goals</li><li>• Designing new workflows, services, and software for Bloomberg customer support in conjunction with product managers, engineers, and UX designers</li></ul>	
<b>Software Engineer at Intuitive Surgical, Sunnyvale, CA</b>	<b>May 2022 – Aug 2022</b>
<ul style="list-style-type: none"><li>• Designed and Improved Automated Testing Efforts for Language Support</li><li>• Automated Database Testing through UI Interactions</li><li>• Integrated moving 3D Model of Robotic System using ReactJS into an internal development tool</li><li>• Executed Software Protocols to ensure the quality of ISI's robotics for FDA regulatory approval</li></ul>	
<b>Product Development Engineer at Asensus Surgical, Durham, NC</b>	<b>May 2021 – Aug 2021</b>
<ul style="list-style-type: none"><li>• Designed and Evaluated adapters to create compatibility between third-party endoscopes and the Senhance Surgical Robot</li><li>• Designed and Evaluated the Next Generation of Surgical Robotics using Solidworks</li><li>• Evaluated various ergonomics to improve the design of the surgeon interface</li><li>• Developed several test verification protocols for sterile drape compatibility with our devices</li><li>• Upgraded surgeon simulators to increase compatibility between the simulator and updated software on newer surgical systems</li></ul>	

**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
- 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)