

GUNNAR BECK NELSON

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EDUCATION



**MASTER'S OF RESEARCH (MRES) MEDICAL ROBOTICS & IMAGE
GUIDED INTERVENTION 2023-2024**
IMPERIAL COLLEGE LONDON
MERIT WITH DISTINCTION



MASTER'S DEGREE (MS) COMPUTER SCIENCE & APPLICATIONS

2020-2022
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA 3.7

BACHELOR OF SCIENCE (BS) ENGINEERING

2015-2019
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA 3.7

EXPERIENCE

VISITING LECTURER

IMPERIAL COLLEGE LONDON-LONDON, UK | NOV 2024- PRESENT

- Advise and teach graduate students on fundamentals of computer engineering practices, and fundamentals of artificial intelligence with deep learning principles, and aid with graduate assignments

LEAD SOFTWARE ENGINEER

NERVE+INC-SAN FRANCISCO, CA | AUG 2021-PRESENT

- Led sprint-based development on 5 CNN deep learning models.
- Developed advanced deep learning solutions for medical imaging and surgical simulation, focusing on private hospital deployments and ensuring strict adherence to healthcare privacy regulations.
- Spearheaded onboarding and cross-functional collaboration with surgeons, driving real-time diagnostics and training tools for hospital use, contributing to a 30% growth in contract acquisitions with major healthcare providers.
- Collaborated on intellectual property development, filing 4 engineering patents for deep learning model innovations tailored to hospital needs and applications.

LEAD SOFTWARE ENGINEER

VAROS-WASHINGTON, DC | JAN 2021- JAN 2022

- Led a cross-functional team of 12 developers through multiple sprints, delivering the VAROS iOS app, integrating AR/VR for patient education based on CAD designs.
- Directed onboarding processes for 5 new developers, increasing team productivity and reducing ramp-up time by 40%.
- Monetized Augmented Reality software using the freemium business model, leading to a 15% increase in monthly recurring revenue.
- Integrated AR creations into the SwiftUI framework, improving user engagement by 30% and driving customer retention.

AI SOFTWARE ENGINEER RESEARCHER

COMMONWEALTH CYBER INITIATIVE-WASHINGTON, DC | MARCH 2021- JULY 2021

- Orchestrated sprint cycles for AR designs on Microsoft HoloLens 2, improving project delivery timelines by 25%.
- Led onboarding and education for a team of 4 researchers, enhancing their proficiency with GPU CUDA and PyCUDA for ML model optimization.
- Implemented Hidden Markov Models, driving public data visualization projects that contributed to partnerships with third-party developers.

GRADUATE TEACHING ASSISTANT

VIRGINIA TECH COMPUTER SCIENCE DEPARTMENT-BLACKSBURG, VA | JANUARY 2021- MAY 2022

- Led student sprints for project-based learning in systems and software security under Dr. Matthew Hicks, overseeing coursework for both graduate and undergraduate courses.
- Provided hands-on guidance for students in advanced graduate-level courses, facilitating a deeper understanding of systems security, human-computer interaction, and algorithms.
- Managed onboarding and mentorship, reducing student ramp-up time by 35% through tailored guidance on advanced cybersecurity and software engineering topics.
- Held regular office hours, offering detailed feedback and assistance to students on complex computer engineering projects.

PEPPER ROBOTICS SOFTWARE LEAD-GRADUATE RESEARCH ASSISTANT

MIND MUSIC MACHINE LAB-BLACKSBURG, VA | AUG 2020- MAY 2021

- Led sprint-based development cycles on two human-robot emotion interaction projects, overseeing a team of 10 in creating and refining robotic software solutions.
- Spearheaded onboarding and training for 15 undergraduate students, ensuring smooth integration into project development.
- Developed 135 custom robot movements using Kotlin and Java-based Android libraries, with a focus on scalable performance across Pepper robots.
- Managed \$250,000 worth of SoftBank Pepper and Nao robotics equipment, optimizing resource allocation for research and development.

SENIOR FULL STACK SOFTWARE ENGINEER

PACIFICA.DEV, SAN FRANCISCO, CA | JAN 2017- JULY 2020

- Led front end and backend development of microservices based architectures with a 35% in scalability and 25% reduction in response time
- Spearheaded migration of legacy systems to modern microservices architectures, reducing 20% of technical debt
- Optimized database queries and data storage strategies, reducing query execution time up to 45%
- Developed customer service checkout for notable startups in the Bay Area using React and React Native for cross compatibility
- Managed engineering interns and conducted code reviews with Jira and Bitbucket
- Developed internal tools for debugging and improving efficiency for both front end and back end developers

PUBLICATIONS & PRESENTATIONS

- **APPLICATION OF VISION TRANSFORMER MODEL ARCHITECTURES IN COMPARISON WITH DIFFERENT DIMENSIONS OF CONVOLUTION NEURAL NETWORKS FOR REAL TIME TISSUE SEGMENTATION FOR ROBOTIC & GENERAL ENDOSCOPIC SURGERY**
JOURNAL OF SURGICAL ENDOSCOPY | MARCH 2025
SOCIETY OF AMERICAN GASTROINTESTINAL & ENDOSCOPIC SURGEONS
- **XMARCUS II: DOMAIN ADAPTATION FOR CLASSIFICATION OF PERIPHERAL NERVE TISSUE**
IMPERIAL COLLEGE LONDON THESIS ARCHIVE | OCT 2024
- **XMARCUS: A PATHWAY TOWARDS REMOTE ROBOTIC SURGICAL TRAINING**
VIRGINIA TECH THESIS ARCHIVE | MAY 2022
- **IDENTIFYING CURRICULUM GAP IN FUNDAMENTALS OF ROBOTIC SURGERY AND FUNDAMENTAL SKILLS OF ROBOTIC SURGERY: HANDLING ADVERSE EVENTS**
JOURNAL OF SURGICAL ENDOSCOPY | APRIL 2018
WORLD CONGRESS OF ENDOSCOPIC SURGERY
- **LAPAROSCOPIC RELEASE OF MEDIAN ARCUATE LIGAMENT**
JOURNAL OF SURGICAL ENDOSCOPY | APRIL 2019
SOCIETY OF AMERICAN GASTROINTESTINAL & ENDOSCOPIC SURGEONS
- **MINIMIZING ROBOTIC SURGERY ADVERSE EVENTS THROUGH MACHINE LEARNING**
JOURNAL OF SURGICAL ENDOSCOPY | MARCH 2021
JAPANESE SOCIETY OF ENDOSCOPIC SURGERY/WORLD CONGRESS OF ENDOSCOPIC SURGERY
- **ACM WORKS OF WONDER SHOWCASE-A PARADIGM SHIFT IN MEMORIALIZATION: LEARNING AND ENGAGEMENT THROUGH 3D VIRTUAL MUSEUMS**
LIBERATION WAR MUSEUM BANGLADESH-MARCH 2021
- **REDEFINING THE DIGITAL PARADIGM FOR MUSEUMS-CONSIDERING THE COVID-19 PANDEMIC**
LECTURE NOTES IN COMPUTER SCIENCE (LNCS) | JULY 2021
INTERNATIONAL CONFERENCE ON HUMAN-COMPUTER INTERACTION
- **KNOWLEDGE IS POWER: LINKING AUGMENTED-REALITY WITH 3D PRINTED INTERNAL ORGANS TO IMPROVE MEDICAL EDUCATION AND INCREASE PATIENT INVOLVEMENT IN CLINICAL STUDIES:**
JOURNAL OF SURGICAL ENDOSCOPY | AUGUST 2021
SOCIETY OF AMERICAN GASTROINTESTINAL & ENDOSCOPIC SURGEONS

VOLUNTEERING

STEM CLASSROOM ASSISTANT

PRICES FORK ELEMENTARY-BLACKSBURG, VA | AUG 2020-MAY 2022

- Teaching 3rd-5th graders about robotics and AI fundamentals.

ALLIED MEMBER

BLACK IN AI | JAN 2021- PRESENT

- Organize and host monthly zoom session to discuss issues on system racism and provide an inclusive community

ALLIED HEALTH MEMBER

SOCIETY OF AMERICAN GASTROINTESTINAL AND ENDOSCOPIC SURGEONS (SAGES) | JAN 2021- PRESENT

- Mentor high school students with advice for pre-medical studies and aid in SAGES' Mini Medical School Bootcamp

SKILLS

- **Artificial Intelligence, Machine Learning, Deep Learning:**
 - **Programming Languages:** Python, C++
 - **AI Libraries:** CUDA, PyCuda, PyTorch, TensorFlow, Scikit-learn, Keras
 - Machine Learning Development
 - Deep Learning Development
 - Robotics Operating System (ROS)
- **Full-Stack Development:**
 - **Front-End Development:**
 - **Languages & Frameworks:** HTML, CSS, JavaScript, React, React Native
 - **Mobile Development:** Swift, SwiftUI, UIKit (iOS), Java (Android), React, Flutter
 - UI/UX Design & Prototyping: Figma, Lucidchart, Adobe Creative Suite
 - **Notable Libraries:** CoreML, ARKit, AVFoundation, StoreKit
 - **Back-End Development:**
 - **Languages & Frameworks:** Go, Node.js, Java, GraphQL
 - **Database Management:** Firebase, PostgreSQL, MySQL, MongoDB (NoSQL)
 - API Development: RESTful APIs, GraphQL
 - **Backend as a Service (BaaS):** Firebase
 - **Cloud Platforms:** Google Cloud Platform (GCP), Microsoft Azure, AWS
 - **DevOps & Infrastructure:**
 - Version Control: Git, Bitbucket
 - CI/CD Tools: Jenkins, GitHub Actions
 - Containerization & Orchestration: Docker, Kubernetes, Bitbucket
 - Monitoring & Logging: Prometheus, Grafana, ELK Stack (Elasticsearch, Logstash, Kibana)
 - Project Management: Jira, Trello

LINKS TO PORTFOLIO OF WORK



WEBSITE



LINKED-IN



GITHUB



GOOGLE SCHOLAR



THESIS: XMARCUS



YOUTUBE CHANNEL