GUNNAR BECK NELSON

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EDUCATION

DPHIL-COMPUTER ENGINEERING
UNIVERSITY OF OXFORD
ACCEPTED 2024-PRESENT

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 microservieces based architectures with a 35% in scalability and 25% reduciton in response time
- Spearheaded migraiton of legacy systems to modern miroservices architectures, reducing 20% of technical debt
- Optimized database queries and data stroage strategies, reducing query execution time up to 45%
- Developed customer serivce 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 GASTROITNESTINAL & 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 | APRIL2018
  WORLD CONGRESS OF ENDOSCOPIC SURGERY

- LAPAROSCOPIC RELEASE OF MEDIAN ARCUATE LIGAMENT
  JOURNAL OF SURGICAL ENDOSCOPY | APRIL2019
  SOCIETY OF AMERICAN GASTROITNESTINAL & 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) | JULY2021
  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 |AUGUST2021
  SOCIETY OF AMERICAN GASTROITNESTINAL & 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, Azure DevOps

LINKS TO PORTFOLIO OF WORK

WEBSITE

LINKED-IN

GITHUB

GOOGLE SCHOLAR

THESIS: XMARCUS

YOUTUBE CHANNEL