




# GUNNAR BECK NELSON

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## EDUCATION

-  **DPHIL-AUTONOMOUS INTELLIGENT MACHINE SYSTEMS 2025-PRESENT**  
**MSC-SOFTWARE ENGINEERING 2025-PRESENT**  
UNIVERSITY OF OXFORD  
GPA: DISTINCTION
-  **MASTER'S OF RESEARCH (MRES): BIOMEDICAL ENGINEERING-MEDICAL ROBOTICS & IMAGE GUIDED INTERVENTION 2023-2024**  
IMPERIAL COLLEGE LONDON  
GPA: MERIT WITH DISTINCTION
-  **MSC-COMPUTER SCIENCE & APPLICATIONS 2020-2022**  
**BS-ENGINEERING 2015-2019**  
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA 3.7

## EXPERIENCE

### SENIOR AI ENGINEER--FULLSTACK+CLOUD+BACKEND)

#### US DEPARTMENT OF ENERGY-WASHINGTON, DC| FEB 2025- PRESENT

- Lead development for fullstack applications for 3 projects (Rulemaking, Permitting, and Certification)
- Create Full Stack AI Applications Javascript/Node.JS, and Azure Cloud backend for the Federal Energy Regulatory Commission AI solutions
- Implement Cloud Engineering backend infrastructure via bicep and full security provisions in government settings
- Securely deploy updated infrastructure software in highly restricted and secure government regulations
- **Skills: Backend Infrastructure Development, Cloud Development Frontend Development, React, Python, Node.JS, Javascript Typescript, Government Software Infrastructure, Cybersecurity**

#### VISITING LECTURER

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

- Teach graduate students in the Medical Robotics & Image Guided Intervention course on fundamentals of computer science, engineering principles, and software engineering development
- **Skills: Lecturing, Communication, Teaching, Graduate Level Teaching, Synthesizing Abstract Information into Concrete Instruction**

#### LEAD SOFTWARE ENGINEER

#### NERVE+INC-SAN FRANCISCO, CA | AUG 2021-MARCH 2025

- Led sprint-based development on 5+ CNN deep learning models with AI Generative Capabilities and classification
- 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.
- **Skills: Lead Development, Mentorship, Convolution NeuralNetwork, Neural Network Development, Artificial Intelligence Development, Biomedical Engineering Software, HIPPA Regulation Compliance**

#### 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/
- Directed onboarding processes for 5 new developers, increasing team productivity and reducing ramp-up time by 40%.
- Monetized Augmented Reality software, 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.
- **Skills: Communication with technical and non technical teams, iOS Development, Embedded Systems, Augmented Reality, LIDAR detection, Mobile Development, Microsoft Hololens Development, C#, Python**

#### GRADUATE TEACHING ASSISTANT

#### VIRGINIA TECH-BLACKSBURG, VA | JAN 2021-MAY 2022

- Graduate Teaching Assistant for Data Structures and Algorithms III for graduate students, CS Systems and Software Security 5590 under Dr Matthew Hicks, Graduate Teaching Assistant for undergraduates in Human Computer Interaction
- **Skills: Teaching, Communication, Graduate Level Teaching, Active Recalling, Synthesizing Abstract Information into Concrete Instruction**

#### 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.
- **Skills: Embedded Systems, C++, C#, Python, AI Development, 5G network, Bash, Linux, Linux OS, Leadership, Communication**

#### 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 humanoid robotic software.
- Developed 135 custom robot movements using Kotlin and Java-based Android libraries.
- Managed \$250,000 worth of SoftBank Pepper and Nao robotics equipment, optimizing resource allocation for research and development.
- **Skills: Humanoid Robotics, Embedded Systems, C++, C#, Python, AI Development, Computer Vision, Human Robot Interaction**

#### 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%
- **Skills: Humanoid Robotics, Embedded Systems, C++, C#, Python, AI Development, Computer Vision, Human Robot Interaction**

## 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 ARCULATE 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

### COMMUNITY MEMBER & ENGINEER

ATLANTA TECH VILLAGE | MARCH 2025- PRESENT

- Help startups with fullstack tech applications

### ALLIED MEMBER

BLACK IN AI | JAN 2021- PRESENT

- Organize and host monthly zoom session to provide an inclusive community

### STEM CLASSROOM ASSISTANT

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

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

### 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, Bash, Bicep
    - **Database Management:** Firebase, PostgreSQL, MySQL, MongoDB (NoSQL), Azure, AWS
    - **API Development:** RESTful APIs, GraphQL
    - **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



GOOGLE SCHOLAR



LINKED-IN



THESIS: XMARCUS



GITHUB



YOUTUBE CHANNEL