GUNNAR BECK NELSON

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EDUCATION

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

MASTER'S DEGREE (MS) COMPUTER SCIENCE & APPLICATIONS 2020-2022
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA 3.8

BACHELOR OF SCIENCE (BS) COMPUTER ENGINEERING 2015-2019
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA 3.7

EXPERIENCE

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

- Performed computer vision instance segmentation on 5 CNN Machine Learning (ML) models to be tested and refined for public domain and crowdsource annotation. Responsible for dataset creation, annotation, filtering, and testing/deploying 5 generic ML models into simulation of 3D model organs. Writing ML models in python, and surgical simulation environment in C++.
- Worked on 3D VR environment for pharmaceutical data analysis and Human-AI interaction workflow environmentbuilt with Unreal Engine 5.0
- Developed MVPs for institutional investing and seed round funding for robotic surgical simulation for cross platform applications on console, PC, and mobile development
- Aided and collobarted with surgeons for real time diganossing and training utilizing SaaS for surgical simualtion and training to aid in surgical care, with the development pipeline of classifcation models to classify medical images to train residence.
- Constructed engineering patents for deep learning model development and design

LEAD SOFTWARE ENGINEER
VAROS-WASHINGTON, DC| JAN 2021- JAN 2022

- Responsible for high scale team development of technical solutions and integration of AR/VR development based on CAD designed anatomy to aid in patient education and lead successful launch of VAROS iOS App
- Focused on monteizing Augmented Reality software using the freemium business model
- Integrated Augmented Reality creations into the SwiftUI framework

AI SOFTWARE ENGINEER RESEARCHER
COMMONWEALTH CYBER INITIATIVE-WASHINGTON, DC | MARCH 2021- JULY 2021

- Responsible for integrating Augmented Reality Design into the Microsoft Hololens 2
- perform configurations of Hidden Markov Models for public domain data for third part applications
- Worked with hands on GPU CUDA, and PyCUDA for performance on ChesXNet ML models
- Supervised and educate colleagues on the basis of Raspberry Pi development, Linux/Unix OS, and lead on projects

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

- Graduate Teaching Assistant for CS Systems and Software Security 5590 under Dr Matthew Hicks
- Aided students in both graduate and undergraduate courses for cybersecurity, human-computer interaction, and data structures and algorithms
- Held regular office hours, listen with empathy and understanding to students to help them succeed within the classroom
- Articulated and broken down advanced concepts in computer engineering for students to understand, helping with proejcts

PEPPER ROBOTICS SOFTWARE LEAD-GRADUATE RESEARCH ASSISTANT
MIND MUSIC MACHINE LAB-BLACKSBURG, VA | AUG 2020- MAY 2021

- Lead two research projects on human-emotive robot interaction
- Developed custom movements in Koltin and Java based Android libraries, with 135 Pepper robot movements
- Performed Computer Visiona dn Audiotoriy tasks for Human-Robot Emotion
- Supervised undergraduate students in coding robot programs
- Managed equipment for Softbank's Pepper and Nao humanoid robotics equipment

SENIOR FULL STACK SOFTWARE ENGINEER
PACIFICA.DEV, SAN FRANCISCO, CA | JAN 2017- JULY 2020

- Construct React-Native based App in JavaScript for IOS/Android platforms, for transactions between users
- Perform SQL queries on PostGRESQL
- Managed engineering interns and conducted code reviews with Jira and Bitbucket
- Led front end and backend development of microsrvieces 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 internal tools for debugging and improving efficiency for both front end and back end developers

PUBLICATIONS & PRESENTATIONS

- **XMARCUS: A PATHWAY TOWARDS REMOTE ROBOTIC SURGICAL TRAINING**
  VIRGINIA TECH THESIS ARCHIVE

- **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), 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: 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

LINKED-IN

WEBSITE

GITHUB

GOOGLE SCHOLAR

THESIS: XMARCUS