GUNNAR NELSON

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EDUCATION

MASTER'S DEGREE (MS) COMPUTER SCIENCE & APPLICATIONS
2020-2022
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA 3.75

BACHELOR OF SCIENCE (BS) COMPUTER SCIENCE
2015-2019
VIRGINIA TECH COLLEGE OF ENGINEERING-GPA: 3.68

EXPERIENCE

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

- Responsible for publishing SaaS applications with recurring revenue subscription and ad based revenue subscription modeling
- Mobile: Self published 21 SwiftUI Applications, Completed 72 SwiftUI features, photogrammetry research on point cloud systems for the iOS environment to extract data points from the point clouds and integrate in the Unreal Engine and Unity environments
- 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
- Enhancing Mobile Application MVPs with MLCore and Reality Kit to create point cloud 3D spaces for machine learning scientists/engineers
- Developed MVPs for institutional investing and seed round funding for robotic surgical simulation for cross platform applications on console, PC, and mobile development
- **Tech stack**: iOS, Unreal Engine, Bitbucket, Git, C++, Bootstrap, Flutter, Oculus Development Hub, Apple Reality Converter, and Apple API AR, CoreML, Intel OpenVino, SwiftUI, Blender, Unity, Git, Kubernetes, Google AdMob SDK, Ad Revenue, in-App Purchasing, StoreKit

LEAD SOFTWARE ENGINEER-IOS
VAROS-WASHINGTON, DC| JAN 2021- DEC 2021

- 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
- Responsible for rending, shedding. lighting, for AR objects in both Unity and Blender
- Published academic paper in the Journal of Surgical Endoscopy
- **Tech stack:** Blender, Unity, Apple Reality Converter, and Apple API AR integration

AI SOFTWARE ENGINEER RESEARCH INTERN
COMMONWEALTH CYBER INITATIVE-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
- Tech Stack: Cuda, PyCuda, Pytorch, Microsoft Azure, Unity, Blender, Embedded 5G Testbeds, Linux

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 and the Mind Music Machine Lab's Robot Theater Elementary school program
- 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
- **Tech Stack**: ROS, Linux, Android OS, SoftBank ROS Software, Python, C++/C based Embedded Systems

FLUTTER-REACT NATIVE-SQL SOFTWARE ENGINEER
IMAWARE, HOUSTON, TX | JAN 2020- JULY 2020

- Construct React-Native based App in JavaScript for IOS/Android platforms, for transactions between users
- Perform SQL queries on PostGRESQL
- Develop React Based Application
- **Tech Stacks:** React, React Native, LucidChart,mySQL, PostGRESQL

SOFTWARE ENGINEERING RESEARCHER
SYNERGY LAB-VIRGINIA TECH-BLACKSBURG, VA | JAN 2019-DEC 2019

- Constructed machine learning models from the UNET Architecture for converting CT scans in MRI images built with tensorflow, sci-kit learn, marplot lib, and pandas
- Showcased data plots for CT sonograms using Tensorflow, Sci-kitfor medical and non medical applications, including financial projections and real estate data plots
- Performed instance segmentation of robotic surgical arm for binary classifcation
- **Tech Stack:** Python, Tensorflow, CUDA, Sci-kit Learn, Pandas, Matplot Lib, Machine Learning, Research, Git

PUBLICATIONS & PRESENTATIONS

- **XMARCUS: A PATHWAY TOWARDS REMOTE ROBOTIC SURGICAL COACHING**
  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

- **AI:**
  - Python
  - AI Libraries: CUDA, PyCuda, PyTorch, Tensorflow, Sci-kit learn, Keras
  - ROS
  - Machine Learning Architecture
- **Object Oriented Programming**
  - C++
  - Java
- **VR/AR:**
  - Unity
  - Unreal Engine
- **Mobile:**
  - iOS: Swift, SwiftUI, UIKit
    - Notable Libraries: CoreML, ARKit, AVFoundation, StoreKit
  - React-React Native
  - Android (also Java development)
  - Flutter
  - In App Monetization: Google Admob, AppLovin, Liftoff
- **Backend:**
  - Backend as a service: Google Cloud Platform, Azure, AWS, MongoDB
  - SQL: PostGRESQL,mySQL, noSQL
  - GoLang
  - NodeJS
- **Web:**
  - HTML
  - CSS
  - Javascript
- **Kernels/Git Deployment:**
  - Bitbucket
  - Jira
  - Kubernetes
- **Front End-HCI**
  - Lucid Chart,Figma, Adobe

LINKS TO PORTFOLIO OF WORK

LINKED-IN

WEBSITE

GITHUB

GOOGLE SCHOLAR

THESIS: XMARCUS

SENSOR TOWER