

Overview

Engineer and startup founder with a track record of delivering real-time, ML-driven systems across academia, industry, and entrepreneurial ventures. As CTO of Digi-Clone, I lead the development of a virtual try-on application, bridging computer vision, 3D modeling, and mobile deployment. Notable projects from my career include a mm-wave scanner for concealed weapon detection and an embedded stereo camera for people tracking in retail applications. As a research engineer at USC, I prototyped full sensor and software solutions for biometric fraud detection. I specialize in imaging pipelines for real-time computer vision applications, and I am experienced in embedded systems (hardware and software design and manufacturing), GPU acceleration, and algorithm development.

Education

The Georgia Institute of Technology:	MS in Electrical and Computer Engineering	2014
Western Carolina University:	BS in Electrical Engineering	2009
(<i>magna cum laude</i>)	BS in Applied Mathematics	

Professional Experience

Digi-Clone Ltd Co (*Founder and CTO*) 2025-Present

The mission of Digi-Clone is to automate the creation of realistic digital-twin human avatars, enabling broad adoption of their applications. The focus application for the company is an interactive, 3D virtual fitting room, where users can dress a custom avatar in a simulated environment. The app allows users to visualize the way garments fit and move on their unique, virtual body prior to purchase. As founder and CTO, I have responsibilities in all areas of the business, including leading the product development. The development involves three main challenges: 1) reconstructing a rigged body model from a minimal set of pose-constrained photos captured by a consumer smartphone, 2) building a large database of 3D garment models representative of retail inventory, and 3) registration of the 3D garments with arbitrary body meshes. My cofounder and I have received the program director's recommendation for the National Science Foundation's SBIR Phase I award in Augmented, Virtual, and Mixed Reality. We are currently awaiting the final award decision, which will fund our development activities for the next year.

Computational Modeling and Software Services, LLC (*Owner*) 2020-Present

Helping startup tech businesses implement solutions to complex computational problems requiring automated decision making from real-time data streams. As a consultant, I offer assistance on the full pipeline of real-time system software design including hardware selection and interfacing, data acquisition and processing, machine learning techniques, and system deployment at scale.

USC Information Sciences Institute (*Lead Research Engineer*) 2020-2023

Lead engineer of several projects in the Visual Intelligence and Multimedia Analytics Laboratory (VIMAL). This is a small research team working on machine learning techniques for biometric security and fraud detection in images and video. The role involves a myriad of engineering tasks focused on developing sensor platforms for deploying the machine learning algorithms in a real-time environment. Responsibilities include software architecture, computational optimizations, data acquisition from multiple sensing modalities, sensor hardware prototyping (some circuit design and CAD of a 3D printed housing), and data collection design and operation. The position also requires writing proposals for large research grants and designing IRB approved human subject research trials.

Liberty Defense Technologies, Inc. (*Sr. Software Engineer*) 2019-2020

Software architect of real-time microwave imaging system for concealed weapon detection. The position was mainly responsible for reconstructing and processing images from data given by a short range mm wave radar transceiver. This required integration of several hardware components including a stereo camera used to locate subjects in the scene. To achieve a real-time frame rate, many of the algorithms were written using CUDA to parallelize processing on an onboard Nvidia GPU. Other responsibilities included implementing fast algorithms for person/object segmentation, triggering captures and other timing between camera and microwave images, and generating training data for object detection models.

FLIR Systems, Inc. (*Software Engineer*) 2015-2019

Firmware/software development of embedded stereo cameras for people tracking in a retail environment. Application areas include: image processing, traffic counting, employee/customer classification using vision and inertial sensor data fusion, BLE beacon advertising. Designed automated mfg. processes (e.g. HW functionality testing, focusing and calibration of stereo lenses) to optimize product scalability.

TekTone Sound and Signal Mfg., Inc. (*Hardware Engineer*)

2010-2013

Designed embedded hardware for nurse call products deployed in hospitals and assisted living facilities. Designed the first UL listed wireless nurse call system.

Teaching Experience

The Georgia Institute of Technology
Teaching Assistant

Circuit Analysis (ECE2040)
TESSAL (Teaching Enhancement via Small Scale Affordable Labs) Center
Fundamentals of Digital System Design (ECE2020)

2013-2014

Software Tools

Languages: C, C++, Python

Tools and Utilities: MATLAB, CUDA, TensorFlow, PyTorch, OpenCV, Docker, Git, Subversion,
Package Managers (opkg, dpkg, pacman), Neovim, Visual Studio, Qt,
L^AT_EX, PADS PCB Layout, OrCAD Schematic Capture, Fusion 360

Operating Systems: Microsoft Windows, Linux

Publications

M. Woldeyohannes, J. Schenk, R. Ingel, S. Rigdon, M. Pate, J. Graham, M. Clare, W. Yang, M. Fiddy, "Internal Field Distribution Measurement in 1-D Strongly Anisotropic Sub-Wavelength Periodic Structures of Finite Length," Optics Express Vol. 19, Issue 1 (Jan. 3, 2011) pp: 81-92.

Presentations

"Integration of Vision and BLE Transmissions for Employee Recognition," FLIR Research Symposium, FLIR Systems, Inc. *2018*

"Enormous Field Enhancement in Periodic Birefringent Media," National Conference of Undergraduate Research, University of Wisconsin, LaCrosse *2009*

"Analysis of Force Controlled Arm Movement," Undergraduate Expo, Western Carolina University *2009*

Honors and Awards

President's Fellowship Recipient, The Georgia Institute of Technology *2013*

Most Outstanding Senior in Electrical Engineering, Western Carolina University *2009*

Freshman Math Award, Western Carolina University *2005*