**Jiztom Francis**

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**Professional Summary**

* Skilled Computer Engineer with over 5 years in hardware prototyping and software development.
* Conducted research on Explainable AI, focusing on data validation and verification in large, multi-dimensional numerical datasets for regression applications.
* Experienced in guiding projects from concept to prototyping.
* Collaborated on deploying comprehensive project solutions and worked effectively with international colleagues, reflecting strong cross-cultural teamwork.
* Served as Graduate Student Senator, fostering collaboration across diverse cultural backgrounds.
* Provided technical and scientific consulting to both industry and academia.
* Proficient in writing scientific code in Python, MATLAB, and C++.

**TECHNICAL and LABORATORY SKILLS**

**Numerical and Data Analysis**: Python, MATLAB, Tensor Flow, R, JMP

**Programming Language**: Python, C, C++, C#, Java, Android, Python, CAPL

**Application Software:** LabVIEW, Circuit Maker, Cadence PSpice, Cadence Virtuoso, Vector CANoe, Qt, EBGuide

**Structure Design:** AutoCAD, Microsoft Visio, SolidWorks, 3D printing Slicers(CURA, PRUSASlicer, etc)

**Operating Systems:** Windows API, Linux (Client, Server and Embedded RTOS), Contiki, ROS, Kali Linux

Hardware Platforms: Arduino, Raspberry pi, ARM Cortex, Nvidia Jetson, Automotive CAN modules.

**Miscellaneous:** Code Blocks, Eclipse, Android Studio, LaTeX, GitHub

**EDUCATION**

* Iowa State University (ISU), Ames, IA

Doctor of Philosophy, Ph.D., Computer Engineering January 2021 - Present

Ph.D. Research focus: Explainable AI on Large Dimensional Regression Data and Data Quality.

* Iowa State University (ISU), Ames, IA

Master of Science, M.S., Computer Engineering August 2017 - December 2019

* Loyola-ICAM College of Engineering and Technology (Anna University), Chennai, India

Bachelor of Science, B.S., Electronics and Communication Engineering August 2013 - May 2017

**EXPERIENCE**

**3M – Corporate Research Systems Laboratory, Ames, IA May 2023-August 2023**

**Data Science and Engineering Inter – Machine Vision / Machine Learning**

* Developed "WandaVision Platform," a sensor testing and debugging tool enabling real-time visualization and analysis of sensor data.
* Designed a mini wind tunnel, "Dewey Duct Project," using Solidworks to enhance air flow sensor testing, achieving a 15% integration improvement with the WandaVision platform.
* Contributed to a data pipeline for wound imagery modeling with camera vision, utilizing U-Net for enhanced accuracy and efficiency.
* Engaged in cross-functional team collaborations for iterative testing and deployment of technologies, fostering innovative solutions through brainstorming sessions.

**Iowa State University - Agricultural Biosystems Engineering, Ames, IA January 2020-Present**

**Digital Ag Graduate Research Assistant – Machine Vision / Machine Learning**

* Undertook projects including multivariable regression with deep learning, seed object detection, insect classification via sound, and SQL pipeline maintenance.
* Researched the enhancement of open-world object and pattern detection by adding data layers to images.
* Authored papers on Pattern-Based Multivariable Regression using Deep Learning (PBMR-DL) and methodologies for sensor data regression using deep learning and pattern recognition.
* Led a funded innovation project for classifying insects based on sound characteristics.
* Automated data extraction for the furrow vision project and developed machine learning models to predict residue from images.
* Developed custom automation and pipelines for data loaders and preprocessing for SQL Servers.
* Actively researching image segmentation and object detection techniques.

**Iowa State University – Digital Ag, Ames, IA January 2020-December 2020**

**Engineer Designer II/ Engineer I**

* Implemented diverse projects including CAN-based GPS tagging, third-party implement integration, satellite-based agricultural predictions, SQL data integration from code, and a camera image acquisition app.
* Developed MRS embedded modules for off-road vehicle CAN controllers, targeting specialized research products.
* Crafted custom scripts for automating data analytics processes, SQL uploads, and backup protocols.
* Established and supported in-house VM-based products, ensuring compatibility with ext4 file formats for file transfers.
* Designed a custom Android app to streamline documentation and image capture for project records.
* Enhanced data collection capabilities in agricultural biosystems research through embedded solutions.
* Created Python-based custom solutions for data visualization and analysis.
* Utilized MATLAB for automated processing and visualization of satellite imagery data, employing NDVI to predict crop production and growth loss.

**Iowa State University - Agricultural Biosystems Engineering, Ames, IA January 2019-December 2019**

**Graduate Research Assistant – Digital Ag**

* Launched projects focusing on object sensing across various terrains and developing advanced machinery data logger units.
* Deployed vision systems and mapping tools, utilizing MATLAB and LabVIEW, to meet the research group's objectives.
* Addressed and resolved technological challenges within the agricultural sector, enhancing overall efficiency.
* Supported Linux-based data logging systems at the hardware level for improved performance.
* Customized embedded products to meet both client and internal research group requirements.

**GE Appliances, Lafayette, GA August 2018 - December 2018**

**Fall 2018 AME Co-Op**

* Developed projects like an On-Line Camera Test System and an Embedded Inventory Control Label.
* Served as Controls and Test Co-op Engineer within the Advanced Manufacturing Engineering group.
* Innovated new test modules and procedures using Python and proprietary software to boost manufacturing efficiency.
* Oversaw and fine-tuned test sequences for new product builds, ensuring quality and performance.

**Hochschule Heilbronn (University of Heilbronn), Germany February 2017 - March 2017**

**Senior Design Project Intern**

* Worked on the Backend Display Driver for a 4th Generation Car Charging Station project.
* Engineered an ISO15118-compliant display driver for car charging stations using C case structures.
* Led a three-member team focusing on developing backend drivers for the display unit.
* Participated in a cultural and language exchange program between two universities.
* Utilized software tools including Python, EBGuide, and C++ for driver development.

**PROJECTS**

**Deep Learning and Pattern-based Methodology for Multivariable Sensor Data Regression**

* Requirement: Prove a faster approach to solving regression using lower computation requirements while increasing the accuracy of sensor fusion.
* Using historic crop data to predict future crop yield based on data about the weather during the entire season.
* Proved that 2D numerical data can be used with large-scale unique data for pattern detection.
* Proposed multiple applications to simplify regression using advanced pattern detection techniques.

**RESEARCH PAPERS**

**Cloud-based multi-sensor remote data acquisition system for precision agriculture (CSR-DAQ)**

A full-fledged product developed to support farmers with remote monitoring of their field parameters such as soil moisture, soil temperature, etc. This open-source sensors data acquisition system allows for custom-made data collection for their required data format for Long-term analysis and improvement in farming practices.

**Deep Learning and Pattern Based Methodology for Multivariable Sensor Data Regression**

We propose a deep learning methodology for multivariate regression that is based on pattern recognition that triggers fast learning over sensor data. We used a conversion of sensors-to-image which enables us to take advantage of Computer Vision architectures and training processes. In addition to this data preparation methodology, we explore the use of state-of-the-art architectures to generate regression outputs to predict agricultural crop continuous yield information. Finally, we compare with some of the top models reported in MLCAS2021. We found that using a straightforward training process, we were able to accomplish an MAE of 4.394, RMSE of 5.945, and R^2 of 0.861.

**LEADERSHIP AND SERVICE EXPERIENCE**

**Iowa State Robotics Club**, **ISU, Ames, IA** **August** **2017-December 2019**

**Member, Autonomous Snowplow Team (CyPlow)**

* Oversaw algorithm development.
* Went to Minneapolis to compete in the autonomous snowplow competition.
* Implemented detection algorithms using 3D Lidar, GPS and Moto Control.

**Student Innovation Fellows, ISU, Ames, IA August 2018-May 2020**

**Graduate Student Senator, Department of Electrical and Computer Engineering**

**Iowa State University, Ames, IA August 2021- Present**

**Memorial Union Advisory Committee Member, Vice President August 2021- Present**

**PROFESSIONAL ASSOCIATIONS**

* IEEE **2017 - Present**
* National Society of Black Engineers **2019 - Present**

**Additional Information:**

My status as a graduate student in a STEM field grants me three years of Optional Practical Training (OPT) authorization. This allows me to legally work in the field of my studies without requiring additional sponsorship from your company. This eliminates any potential delays or hurdles in the onboarding process.

Link to Human Readable Resume : <https://resume.creddle.io/resume/1lk1tsqz4jh>