JIZTOM KAVALAKKATT FRANCIS

PHD CANDIDATE

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jiztom
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slezoric

Skills

SCRIPTS & PROGRAMMING LANGUAGE
Python
C
MATLAB
C++
Verilog
Chisel (Scala)
Java
CAPL
C#

APPLICATION SOFTWARE
LabVIEW
Blender 3D
Unity
Xilinx ISE Design Suite
Cadence PSpice
Cadence Virtuoso
CANoe
Qt
EBGuide

OPERATING SYSTEMS
Windows API
Linux(Client ,Server and embedded RTOS)
Contiki
ROS
Kali Linux

HARDWARE PLATFORM
Arduino
Raspberry Pi
ARM Cortex
Xilinx Zync FPGA
hardware prototyping
Embedded CAN module
Nvidia Jetson
MRS CAN Modules

PROTOCOLS
ISO 15118
CAN Bus 11898
802.1x
Bluetooth

Objective

Looking for Co-op / Summer Internship in the domains of Machine Learning, Computer Vision, and Embedded Computing.

Education

Iowa State University, Ames, IA USA — Fall 2017 to Current
PhD Computer Engineering 2023
Master of Science Computer 2019
A work break of one year 2020

Loyola ICAM College of Engineering and Technology — June 2013 to May 2017
Bachelors of Engineering Electronics and Communication Engineering 2017

Employment

Iowa State University - Agricultural Bio-systems Engineering — Ames, IA
Digital Ag Graduate Research Assistant — Jan. 2021 to Current

- **Project:** Seed Object Detection, SQL Pipeline maintenance, ML projects.
- Create a labeled dataset for future Machine Vision projects for the research group.
- Written custom automation and pipeline for data loaders and data pre-processing to SQL Servers.
- Working with undergrads on startup projects on using sounds to isolate unique sound signatures for non-destructive detection of useful insects.
- In charge of maintaining and upgrading the servers used in the research group.
- Actively working on researching Image segmentation and object detection techniques.

Ames, IA
Engineer Designer II / Engineer I — Jan. 2020 to Current

- **Projects:** CAN-based GPS Tagger, CAN-based Third-party Implement integrator, Satellite-Based Farming Prediction, Code first SQL Data Integration, Camera Image Acquisition App
- Programming and Implementing MRS Embedded Modules for Off-road vehicular CAN-based controller for specialized Research products.
- Scripting custom process automation code for Data analytics and SQL Uploads with Backup protocols.
- Setting up and providing in-house support for VM-based products and file transfers with ext4 file format support.
- Designed custom Android App for more efficient documentation in Image capture for Project records.
- Embedded solutions to improve data collection capability in the research of the Agricultural Bio-systems Domain.
- Python-based custom solutions for data visualization and analysis.
- MATLAB-based automation for visualizing and processing Satellite Imagery data to predict crop production and growth loss using NDVI.

Ames,IA
Graduate Research Assistant — Jan. 2019 to Dec. 2019

- **Projects:** Sensing Objects in Multiple Terrain, Advanced Machinery Data logger Units
- Implementing vision systems and mapping tools to achieve the required goals for the research group using tools such as MATLAB and LabVIEW.
- Sort out the Technological Challenges the Agricultural segment face and find ways to solve and improve overall efficiency.
- Working on supporting Linux-based data logging systems at the hardware level.
- Program Embedded products to suit the required client and internal needs of the research group.

GE Appliances — Lafayette, GA
Fall 2018 AME Co-Op — Aug. 2018 to Dec. 2018

- **Projects:** On-Line Camera Test System, Embedded Inventory control label
- Controls and Test Co-op Engineer in the Advanced Manufacture Engineering group.
- Prototype new test modules or procedures to improve manufacturing efficiency using python and proprietary software codes.
- Maintain and rectify the test sequence for new builds.

Iowa State University - Dept of Electrical and Computer Engineering — Ames, Iowa, USA
Graduate Research Assistant — May 2018 to Aug. 2018, Jan. 2019 to Current

- **Project:** Long Range Irrigation Monitoring System
- Research Assistant in the Internet of Things (IoT) Research Group developing a Wireless Sensor Network for Precision Agricultural Domain. (Smart Farming)
- Design custom data-logger with wireless capability at a generic level. Using Python at the high-level post-processing and C++ at the firmware level.
- Enable future technologies to include temporary storage and additional sensor option for the specific farming application.

Hochschule Heilbronn (University of Heilbronn), Germany — Heilbronn, Baden-Württemberg, Germany
Senior Design Project Intern — Feb. 2017 to Mar. 2017

- Developed Display driver for ISO15118 based Car Charging Station written in C case structure.
- Led a three-member team, with a specific focus on back-end drivers for the display unit.

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Projects

Fall 2019 to Current — **Satellite Based Farming Prediction**
- **Requirement:** Provide algorithmic implementation for analyzing and predict field Crop quality using remote sensing.
- Provide MATLAB/Python Automation to facilitate the processing of data for each specified field locations.
- Proprietary research in NDVI performed for one of the clients in the research Group.

Jan. 2019 to Feb. 2020 — **Stubble Height Detection for Sugar Cane**
- **Requirement:** Design and develop a tool to measure and adjust the cutting blade for sugar cane harvester.
- Custom algorithm to get the required live stubble height based on LIDAR line scan data.
- Provide feedback to the system to get the blades adjusted to obtain the maximum yield.
- Procured data and provided proof of concept to the client by field testing.

Jan. 2020 to May 2020 — **Code First SQL Data Integration**
- **Requirement:** Process incoming client data over FTP and upload it into the SQL Server at set intervals.
- Using C# with Entity framework for Code First Database model to upload filtered data into SQL Server.
- Process and prevent duplicate of incoming client Flat Files uploads and provide efficient archive directory architecture for easier SQL query data.

May 2018 to Dec. 2019 — **Cloud-based multi-sensor remote data acquisition system for precision agriculture (CSR-DAQ)**
- **Requirement:** Design cost-effective and accurate data logger for IoT based information gathering and prediction for the horticulture department.
- Developed the prototype Data logger at stage 4 with a power management cycle perfected to run an entire crop season.
- The end product allows a layman to visualize and measure data of the field as a part of Smart Farming.

Fall 2016 to July 2017 — **3D Delta Printer - custom build**
- **Requirement:** Design and implemented a custom-designed 3D FDM printer for in house prototyping use.
- 50 cm Delta 3D printer with customizable parts and modified firmware which supports multiple filament support.
- Arduino MEGA based 3D printer driver with high-performance stepper motor drivers.

Paper Publications

Cloud-based multi-sensor remote data acquisition system for precision agriculture (CSR-DAQ) · Master's Thesis — Spring 2018 to Fall 2019
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.

Integrating Wireless Control in Smart Home System using Wi-Fi Mesh with IoT and Android on Raspberry Pi Platform — Spring 2017
Integration of mesh concept to modular control units to reduce wiring, power and cost of the final system. Easier deployment with Private IP configuration.

A Novel Smart Home System based on IoT using Raspberry Pi and Android Application — Fall 2016
Published in National Conference on Computational Intelligence System (NCCIS'16), India. A practical approach to smart home industry based on the current system of non-smart devices and the availability of low powered programmable switching devices.

Hackathons

HackISU Fall 17 · MLH Hackathon — Fall 2017
Ames, Iowa, USA
- A 36 hour no sleep hackathon to learn, explore, and develop new ideas based on challenges presented by the sponsor companies.
- Completed the Image perception and detection challenge and won a desktop 3D printer as the challenge prize.
- Created a video-based self-stabilizing hardware system based on QR codes and video input streams. This can be used to replace wire-based sensors for testing hardware.

HackISU Spring 18 · MLH Hackathon — Spring 2018
Ames, Iowa, USA
A 36 hour no sleep hackathon to learn, explore, and develop new ideas based on challenges presented by the sponsor companies.
Worked on creating AR-based projects to explore tools available to merge the virtual world with the real world. Applying ideas of augmented reality into the application using the Real Engine.

Certification

ARM 7, Cortex M Microprocessor Architecture — Fall 2016

REDHAT · REDHAT Certified System Administrator (RHCSA), REDHAT Enterprises. — June 2015

IIT-Kanpur · Basic Ethical Hacking hosted by IIT-Kanpur at LICET. — Sept. 2014