JOSEFFUS SANTOS

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EDUCATION

University of Manitoba — Winnipeg, MB Canada
Bachelor of Science Major Computer Science DGPA 4.0 / 4.5 — Jun 2024
Bachelor of Science Major Biochemistry

TECHNICAL SKILLS

- TypeScript
- Node.js
- React
- Angular
- Ubuntu
- C#/.NET
- RAPIDS
- Python
- OpenCV
- AWS/GCP
- Scikit
- TensorFlow 2
- Docker
- C / C++
- Azure DevOps
- SQL
- REST
- Catch2
- PyTest
- Git

EXPERIENCE

Programmer Analyst (Full Stack) — Sep 2023 – Present
Research Technician — Feb 2011 – Sep 2023
Canadian Grain Commission, Government of Canada

- For four years, led task planning and scheduling for 4 technicians to organize work for the Harvest survey program.
- Led a team of 5 students to explore machine learning models to predict the incidence and severity of Ergot. Used GitHub for source code hosting and project tracking. Developed CI pipelines using GitHub Actions for automated type checking and linting.
- Designed a multi layered microservice architecture for project development and deployment. Defined Postgres and GPU enabled TensorFlow RAPIDS container environments. Created Docker swarm definitions for rapid environment setup. Created ETL pipelines in Python to scrape API endpoints for soil and weather data from ground station and satellite sources.
- Explored Random Forest models for weather-based predictions of wheat crop protein content.
- Contributed to Canadian Food Inspection Agency AI Lab open-source software projects. Implemented structural code changes that fixed bugs and significantly improved performance of a React TypeScript front end layer. Participated in code review to suggest changes in-line with best practices. Created Vitest unit test suites to validate components critical to app functionality. Added components to allow user feedback on AI model inferences.
- Created and updated TypeScript React components for Microsoft Power Platform Power Apps web portals for external services. Used Azure CLI and Power Platform CLI to push changes. Debugged Azure pipeline deployment issues. Added new features and fixed bugs in internal LIMS applications using PowerScript. Developed new views and stored procedures for MS SQL server databases. Collaborated with Agile teams using Azure DevOps, GitHub, and ServiceNow.
- Created animated charts and geographic choropleth maps to display protein distributions and historical data using Python for publication on the organization website.
- Developed ETL programs in C#, VBA, and TypeScript to extract data and add custom functions to instrument control software.
- As part of an exploratory trial, AWS cloud administration. Designed and maintained a network of Windows and Linux EC2 instances to trial data analysis on the cloud with deployment scripts for users to automate service orchestration using AWS CLI.
- Gathered software requirements from stakeholders internal and external to the organization. Implemented new features based on user feedback.
- Contributed to data collection, analysis, and authoring research papers. Conducted journal searches and wrote review summaries of the current state of research on topics of interest. Presented internally to share state of the art information on visual grain quality evaluation systems.
- Participated in cross government task groups. Worked with the Federal Science Computing Working Group to find resources and policy to help departments allow scientists to contribute to external facing open code repositories.

Software Engineer (Full Stack) Part-time Consultant — Mar 2023 – Present
DecisionWorks

- Designed and implemented a dashboard system to display and manage railway maintenance jobs with a frontend in Angular TypeScript, backend in C# dotnet core on an IIS server, and a data layer in MS SQL.
- Designed a React application hosted on S3 to allow clients to upload folders of files to S3 for processing.
- Developed an embedded Google maps component with GeoJSON layers, custom markers, and clusterers for data visualization.
- Created a calendar scheduling system to plan railway maintenance tasks and deploy workers.
- Created scripts to deploy AWS EC2 and LightSail resources using AWS CLI, AWS EventBridge, AWS Lambda, AWS API Gateway. Developed end to end automated integration tests using Playwright.
- Communicated with the client to gather user requirements and proposed solutions to address their needs. Estimated time and effort required to develop requested features. Incorporated feedback into future design and deliverables.

EXPERIENCE

Software Engineer (Full Stack) Casual — Jun 2024 – Present

University of Manitoba

- Designed and implemented a split network system using an Ubuntu Server with two NICs to administer an isolated network of 70 Raspberry Pi machines for Precision Agriculture.
- Designed Ubuntu Server base images that self assign unique server names to allow seamless addition of new systems.
- Wrote Python and C++ to gather and process RGB, IR, and TOF Depth data from a multisensor camera
- Created Ansible scripts to manage swarm configuration, monitoring, data migration, and scripts to push new script changes to the swarm.

Software Developer (Full Stack) Part-time Consultant — Sep 2023 – Dec 2023

Software Developer (Full Stack) Co-op — Jan 2023 – Apr 2023

AGCO Corporation

- Implemented new functional React components to display remote sensor data from LoRaWAN endpoints on a dashboard. Converted vanilla JavaScript class based React components to TypeScript functional React components.
- Implemented an alert system to warn users of critical fan system control failures to catch them early and prevent losses.
- Contributed new backend features in Python to support new API functionality using AWS Chalice for serverless AWS applications.
- Troubleshot and fixed bugs in both front end and backend code.
- Managed local dev environments in Docker containers for local dev and testing. Addressed Issues that came up on GitLab CI/CD pipeline tests to fix non-conforming code. Created PyTest and Jest, unit, and integration tests.
- Worked in an Agile environment, participated in scrum activities.

PROJECTS

Personal Cloud / Home Lab | ZFS, Linux, GCP, AWS, VirtualBox, Docker — 2014 - Present

- Network of multiple LAN hosted, cloud hosted, and hypervisor hosted web services.
- Mixture of LAN Linux and Windows hosts; Linux hosts on AWS that run applications in docker to provide VPN, Reverse Proxy, SOCKS5, SSH, remote desktop, content delivery, server monitoring and other services.

Forest Fire Prediction Model | Python, Docker, Postgres, QGIS, GeoPandas, sklearn, TensorFlow — 2022

- Used Python to scrape data from weather stations nearest forest fires.
- Extended Postgres and Nvidia TensorFlow containers to build dev environments for machine learning.
- Trained and evaluated SVM and Random Forest models for forest fire severity prediction using weather.

Meal Planner Calorie Tracking App | Android, Java, JUnit, Espresso, HSQLDB — 2022

- Designed and built a Java Android app following Agile development practices.
- Applied software design patterns, implemented object-oriented class design, and thorough unit testing.
- Implemented a relational database in Hyper SQL DB to store application data. Followed a 3-layer architecture.

Piston Pump | Fusion360, KiCAD, C++, Atmel SAMD — 2019 - 2022

- Designed and built a piston based liquid delivery device that exceeded ASTM class A standards for accuracy and delivery speed.
- Designed touchscreen interface for human interaction, control, calibration, error recovery.

City Winnipeg Database | Python, Qt, SQLite, Google Maps API, GeoPandas, Pandas — 2021

- Combined multiple open data sources about the City of Winnipeg into a 3NF and BCNF normalized relational database.
- Used Google Maps API to get asset geographic coordinates and used GeoPandas to measure distances and regional inclusions.
- Created Windows, Linux cross platform GUI program in Python to run queries against SQLite DB

3D Printer | Fusion360, C++, RAMPS, Arduino Mega, RaspberryPi — 2016 - 2017

Designed and built an FDM 3D printer with control and monitoring via web interface.

Wireless Controllable Outlet Hub | C/C++, HTML, CSS, JS, esp8266 — 2016

Lan/Wi-Fi connected hub for controlling remote switches over 433mhz with cross platform embedded web page for control.