Mark Musil - www.MarkMusil.click

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CERTIFICATES

Amazon Web Services Certified Cloud Practitioner

Electronics Technician Certificate

Eastland-Fairfield Technical School 2011 - 2013

EDUCATION

BS Electrical Engineering

Portland State University - Portland, OR 2015 - 2020

COMPETENCIES

System Architecture - MBSE, UML, Eclipse Papyrus, SysML, MagicDraw, Cameo EA, Genesys

Hardware - Radiofrequency system and antenna design, Network and spectrum analyzers, Oscilloscopes, Antenna Testing, FPGA, EOL Modeliinq, LTSpice

Software

Operating Systems — Windows, Ubuntu, Debian, OpenWRT

Computer aided drafting — Quartus Prime (Intel), Xilinx Vivado, Fusion 360 circuit and 3d modeling

Web - Debian, Python, Docker, Git, MySQL, Apache2, Wordpress

Embedded systems - MATLAB, C/C++, LabVIEW, VHDL, Verilog, Xilinx SDK, Zynq7000

Machine Learning - Keras, TensorFlow, Computer vision, DNN, CNN, Classification, Voice Conversion, CUDA

Cloud (AWS) - Lambda, EC2, Amplify, Route53, DynamoDB, Elastic Container Service, Rekognition, Amazon Translate, Amazon Comprehend, LightSail

EXPERIENCE

Engineering Consultant I Sole Proprietor I Remote

June 2025 - Present

- Computer Vision system for high-resolution biological images
- Production Level AWS AI Infrastructure microservice implementation: React frontend and GPU backend
- Custom built YOLO architecture tailored to bacteria detection domain
- Project management and development roadmap creation

Embedded Systems Engineer I Armada Power I On site

April 2024 - June 2025

- Time Series Anomaly detection in order to provide predictive maintenance services to multi-family housing clients.
- C++ embedded Linux development for smart water heaters (IoT systems)
- OpenWRT based embedded Linux operating system design integrating Sensor Data with real time MQTT messaging
- SysML and UML reverse engineering and diagramming of C++ code bases
- SysML modeling of water heater switching fleet and associated embedded system devices
- PCB Component level board design for IoT smart devices using Fusion 360
- WifI, LTE, Bluetooth RF design and testing in the LBAND, SBAND, and CBAND

Freelance Engineer I Upwork I Remote

August 2023 - Present

- Build and manage wordpress domains for small businesses
- Develop 3D printed cases for prototypes using Fusion 360
- Perform Raspberry Pi prototyping for start up clients
- Perform statistical analysis and report generation for small signal and radar applications
- Develop Fourier transforms using Python for spectral and statistical analysis

Software Engineer I ECS Federal I Full-Time I Hybrid

January 2023 — August 2023

• Use C# and ModBUS TCP to control hardware over ethernet network for real time systems coordination. • Develop Gitlab version control Architecture for Amazon Web Services and Implement on Amazon Web Services using Elastic Container Service (ECS)
• Develop LabView hardware control and graphical user interface (GUI) code for radar systems
• Work in Python to automate documentation and perform high level testing
• Work in C++ for radar hardware control systems and data processing

Systems Engineer I ManTech I Full-Time I Remote on-site hybrid

December 2020 — December 2022

- Architect large-scale counter drone projects using model-based systems engineering (MBSE) and SysML in MagicDraw and Cameo.
- Apply rigorous model-based systems engineering to grow ManTech's contract pool.
- Developing C++ drivers and GUIs as well as Python, LabView and MATLAB signal processing methods for radar applications • Design and characterize radio-frequency systems in the context of a system of systems.

Lead Engineer I Sawback Technologies Inc. I Part-Time I Remote

October 2020 — June 202 1

- Designate team development goals for a ground-penetrating radar system
- PetaLinux development on Xilinx SOC/ FPGA development to interface with Radiofrequency board ADCs, frequency synthesizer.
- Zynq7000 processing system embedded C development for SPI communications, data acquisition, and control. • Analog circuit design for ground penetrating radar applications in the ultrahigh-frequency range.
- System debug and troubleshooting using logic analyzers, spectrum analyzers, oscilloscopes.
- Technical communication with investors. Translating system-level project specifics to non-technical status reports.

Software Engineer I Intel Corporation I Internship I Remote

June 2020 — September 2020

• Improved data accessibility within my workgroup by scripting a Python Tkinter GUI used for the analysis of wafers, adding user configuration utilities to the program as well as adding FFMpeg video rendering capabilities. (Wrote about 3000 lines of Python3.)

- TEM data analysis GUI

• Developed a Python wrapper for recursively monitoring changes in variables used for a data analysis session.
• Independently pioneered the use of GitLab issues during the project and thereby increased team efficiency.

Product Validation Engineer I Stevens Water Monitoring Systems I Internship I Portland, Oregon

October 2019 — June 2020

- Decreased product waste by scripting automated test equipment software (five-stage continuous delivery testing) for an embedded environment sensor product. Included an SDI-12, RS485 firmware interfacing testing suite, AWS MySQL database interfacing, inventory management software, CLI interactive interface. (approx. 1000 lines written in Python 3)

- Developed embedded systems in C for device current measurement and rapid switching as well as automated data cleaning methods for discovering failure trends over time.
- Deployed testing environment uniformly across Linux Mint and Ubuntu instances via bash scripting and Docker.

Machine Learning Engineer I Intel Corporation I Internship I Portland, Oregon

June 2019 — September 2019

- Data quality control and screening errors for TEM Metrology data generation.
- Reduced validation time for Intel's silicon wafer assembly line by developing a DNN computer vision wafer defect detection tool.
- Scripted a neural network optimization system that automatically found ideal architecture/hyperparameters for a given machine learning application.
- Wrote 500 lines of Python3 code, working with TensorFlow via Keras front-end. Developed a methodology for quickly creating a machine learning Python environment and enabling CUDA support on new machines to be used for training.

Reliability Researcher I IRT Saint-Exupery Laboratory I Internship I Toulouse, France

April 2018 — September 2018

Reduced chip testing time from —10,000 hours to —500 hours by formalizing an emerging failure analysis technology which allows failure in time (FIT) prediction for deep sub-micron (20nm and below) devices - see my publication below titled Synopsis of Multiphysics...

- Prototyped the methodology using a Xilinx Ultrascale+ FPGA. Implemented the methodology using VHDL (—500 lines), the Vivado suite, IJART serial interfacing, and testing protocol standards.
- Used TcL scripting to control certain aspects of the FPGA design rule check and to optimize the use of Vivado.

Publications

Synopsis of Multiphysics Deep Sub-Micron Failure Rate Modeling Technique for CFR and EOL Prediction

IEEE Nanotechnology Materials and Devices Conference (NMDC)

Authors: Mark Musil; Alain Bensoussan; Joseph Bernstein; Fabio Coccetti doi.•10.1109/NMDC.2018.8605877

2018

Combining Algorithms for More General AI

Undergraduate research and mentoring program

Author: Mark Musil

http://archives.pdx.edu/ds/psu/25180

2018

A Dendritic Transfer Function in a Novel Fully connected Layer

Undergraduate Honor's Thesis

Author: Mark Musil

http://archives.pdx.edu/ds/psu/28835

2019