

# Mark Musil - [www.MarkMusil.click](http://www.MarkMusil.click)

[Mark.R.Musil@gmail.com](mailto:Mark.R.Musil@gmail.com)  
740-703-2110

## 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, SysML, MagicDraw, Cameo EA, Genesys

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

**Software**

Operating Systems — Linux Mint, Ubuntu, Debian (Nginx), PetaLinux

Electrical computer aided drafting — Quartus Prime (Intel), Xilinx Vivado

Web - Debian, Gatsby, Python, Docker, Git, AWS(MySQL), Apache2, TCP, IR WordPress,

Embedded systems - MATLAB, C++, LabVIEW, VHDL, Verilog, Vivado, Xilinx SDK, Zynq7000 Processing system

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

Embedded Systems Engineer I Armada Power I On site

August 2023 - Present

- C++ embedded Linux development for smart water heaters (IoT systems)
- OpenWRT based embedded Linux operating system design
- 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 Radar Engineer and Website Designer I Upwork I Remote

August 2023 - Present

- Build and manage wordpress domains for small businesses
- Reduce hosting costs using AWS LightSail, Route53, and Right-sizing
- Small signal processing and filtering applications using embedded Python on Red-Pitaya
- 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 2021

- 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