

MADISON MORGAN

2 YEARS WORK EXPERIENCE & 5+ YEARS GENERAL PROGRAMMING

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WORK EXPERIENCE

Mechanical Assembly and Automation Developer | *Center for Mechatronics and Automation Technology (ZeMA)* May 2019 – Aug. 2019

- Designed an automated assembly sequence planning tool for Transmission Systems using the SolidWorks API which improved the run-time efficiency of a computer-assisted assembly station and reduced human intervention
- Researched and implemented literature on mechanical assembly sequence algorithms and mechanical interference
- Implemented reinforcement learning and performed model validation to later abstract into the mechanical assembly sequence planning tool to automatically generate transactions needed within the assembly sequence
- Technologies:** *Algorithms (Q-Learning, POMDP, State-Space Search, Bourjault, Cut-Set), CAD (SolidWorks, AutoCAD), Python (OpenAI, SQLAlchemy, Pandas, SKlearn), Visual Studio (C#, VB6, SolidWorks API, Windows Forms App)*

Embedded Software Engineer Intern | *Curtiss-Wright Defense Solutions* Sept. 2018 – Dec. 2018

- Developed a library for parsing, signing, corrupting, and verifying Intel Images which allows authentication of an internally developed Boot Guard Process, reducing test-case time by 82%
- Designed a parser to parse an xml configuration file to change settings in order to adhere to a variety of images (approx. 70% of images to be tested) and document a set of functions to be performed for easy repeat of test cases
- Implemented a command line tool paired with said library to easily perform a number of operations such as: parsing an xml configuration file, running library functions on an image, documenting corruption profiles, and generating keys for signing
- Technologies:** *Python (PyCryptoDome, Ctypes, Argparse, PyWin32), Intel Image Processing, UEFI Firmware, Software Security Concepts (RSA, SHA, Signing, Encryption, Boot Guard), Agile Methodology (Jira, Kanban), Git*

Design Verification and Automation Intern | *Lumentum Operations LLC* Jan. 2018 – Aug. 2018

- Automated a set of software regression tests in Python, tested on a complex optical system by developing device and communication drivers paired with a GUI and result summation, which reduced the time to run regression by 77%
- Automated to a coverage of approximately 66% of test-cases, test-cases included the testing of: Alarms, Optical Hardware, Netconf communication, CLI, Logs, Security, Firmware, FPGA electrical verification
- Automated the data analysis and visualization of a very large (500k+ data points) optical design verification resultant data set into a well-structured presentation of concise plots to show to senior management and customers using Python
- Implemented a Raspberry Pi as an Ethernet terminal server to be adapted into an automated testing network architecture
- Renewed and Repaired a machine learning algorithm to efficiently calibrate tunable lasers using TensorFlow in Anaconda
- Technologies:** *Python (Tkinter, Paramiko, Telnetlib, NumPy, SciPy, Pandas, Keras, Matplotlib, Pillow), Raspberry Pi, Protocols (Serial, Netconf, SFTP, TCP/ICP), PuTTY, Tera Term, Bash, Tensorflow, Jupyter, Anaconda, Electrical Hardware (Oscilloscopes, Spectrum Analyzers, Switches, Tunable Lasers), SVN*

Configuration Analyst | *Innovation, Science, and Economic Development Canada* May. 2017 – Aug. 2017

- Updated 63% of a web-based knowledge base using vanilla HTML & CSS, applied UX Principles and tested across various browsers (IE, Chrome, Firefox)
- Created a logical data model for tool incident & service request management to organize customer services and configured a management database to track resources and accountability across a 5000+ employee department
- Technologies:** *HTML, CSS, Adobe (Photoshop, Illustrator), Excel, JIRA Project Management SW, VBA, Agileft*

PROJECTS

Intelligent Distribution Panel | *Real-Time Intelligent Solar Panel* Jul. 2020

- Developed on a Beagle-Bone Microprocessor, controlled device peripherals to optimize solar panel in real time
- Technologies:** *C, Beagle-Bone (GPIO, ADC, SPI, UART, Relays)*

Human Protein Atlas Image Classification | *Neural Network for Kaggle Competition* Oct. 2020

- Built and trained a convolutional neural network to classify protein structures from microscope images
- Technologies:** *Python (Keras, Tensorflow, Sklearn, OpenCV), Git, VGG*

EDUCATION

B.A.Sc., Computer Engineering with Co-op | *University of Ottawa* Sept. 2015 – Apr. 2020

- GPA 8.3/10, Dean's Honors List Recipient (2015-2020)
- Scholarships:** *Academia Excellence (2015-2020), International Engineering Experience (2019), Co-op Mobility (2019)*