STEVEN BREWER

ROBOTICS and MACHINE LEARNING ENGINEER

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EDUCATION

2020 – 2022   *GPA 3.90*
MASTERS IN ROBOTICS ENGINEERING
Worcester Polytechnic Institute

2008 – 2010   *GPA 3.25*
BACHELOR OF MECHANICAL ENGINEERING
West Virginia University

SKILLS

Programming: ROS, Python, SQL, C++, and MATLAB/Simulink

Data analysis: Pandas, Numpy, SymPy, and SciPy.

Data visualization: Matplotlib, Seaborn, and Plotly.

Machine Learning: OpenCV, Pytorch, Airtic Icevision, Fastai, Scikit-learn, Keras, PyMC3, and TensorFlow,

CAD: Fusion 360, NX / Unigraphics, Pro Engineer.

FEA: ANSYS: Structural, Modal, Heat Transfer, & Random Vibration

Physics Simulation: Gazebo, AirSim, ARGoS, & ANSYS

Microsoft Office Suite: Excel, MS Project, Word, PowerPoint etc.

WORK EXPERIENCE

2022 - Present

MACHINE LEARNING ENGINEER
Pratt and Whitney Engineering Tools and Methods

Spearheaded automated defect detection modeling as a founding member of the AI/ML methods team within Pratt and Whitney

- Assisted with developing the implementation of MLOps model registry and inferencing service
- Created classification and segmentation models for multiple engine programs that were onboarded into MLOps platform after passing all safety and quality requirements
- Implemented anomaly detection models and data drift monitoring

2022 - 2018

DATA SCIENTIST
Pratt and Whitney Mikro Systems | Charlottesville VA

Optimized the manufacturing process of anti-scatter grid collimators for CT scanners and assisted with data capture and analysis on turbine blade ceramic cores.

- Implemented image classification model in Pytorch to predict dirtiness of the product which drove out subjectivity of assessment.
- Automating X-ray defect detection using deep learning image segmentation model
  - Provided fast and repeatable results.
  - Reduced premature breakage and structural defects.
  - Process insight was gained from aggregated data.
- Through robust data analysis optimized ceramic turbine core tooling life and scaling.
- Automated the comparison of production deviations to their in-process cohort.
- Developed OpenAI gym compatible reinforcement learning simulation to optimize the engine component module matching.
- Data display dashboards for all levels of management and production were developed.

2022

Masters Capstone
WPI Team Leader

Developed an autonomous system which detected road obstructions to assist first responders after a natural disaster. The system used UAV drone (agents) that learned on camera, depth, and IMU data to explore roads through curriculum-based reinforcement learning. The system was developed in AirSim and Unreal Engine and utilized double deep Q learning.

COURSEWORK

- Deep Learning for Robot Perception.
- Deep Reinforcement Learning
- Sensor Fusion: Vision based Simultaneous Location and Mapping
- Bayesian Statistics
- Robotic Dynamics and Control
- Brain to Computer Interface

ACHIEVEMENTS

2021
Pratt and Whitney Innovation Fair Winner
Automating X-ray Defect Detection Presentation

2020
Six Sigma Green Belt
Core Liner Lifecycle optimization

2017
Airflow Measurement Instrumentation Design
SAE & AIAA Turbine Engine Test Working Group Presentation

2007
NASA Living with a Star Internship
Goddard Space Flight Center

WORK EXPERIENCE (CONTINUED)

2018
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2016

MECHANICAL ENGINEER
CALSPAN | Newport News VA

Technical lead engineer for transonic and subsonic wind tunnel K-FX fighter models, SR-72 Blackbird Blockage Model. Integral part of the design of two wind tunnel actuation systems for testing the Boeing Blended Wing Body.

- Detailed analysis was performed using FEA (ANSYS) and validated through hand calculations.
- Model system reports was generated and approved by tunnel owners.
- Derived equations of motion for the control system.
- Assisted with instrumentation calibration.
- Drawings for manufacture were developed using GD&T.
- Oversaw conventional and additive (DMLS, SLS, SLA, & FDM) manufacturing.
- Resolved out of tolerances working on the Material Review Board (MRB).
- Managed the build of the wind tunnel models.
- Assisted with signal post processing.

2010
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2016

MECHANICAL ENGINEER
Triumph Aerospace Systems | Newport News VA

Technical Lead Engineer for the Triumph portion of the AETD (Adaptive Engine Technology Development) Program. Managed and collaborated with a team of engineers, instrumentation specialists, and manufacturing and assembly technicians to develop instrumentation, stator vane actuation systems, bleed air manifold system, and assembly tooling. Worked hand in hand communicating with General Electric (GE) and the United States Air Force (USAF) Compressor Research Center from preliminary design to test cell installation.

- Selected instrumentation and analyzed routing egresses.
- Designed and analyzed precision airflow monitoring structures (rakes).
- Performed static and dynamic FEA analysis on structural components.
- Assisted with signal processing.

Associate Engineer on the retrofitting and root cause analysis of the Korean Aerospace Industries (KAI) rotor test stand upgrades.

- Provided on the ground support to identify wear and validate upfitted changes to the rotor test stand.
- Performed data analysis to ensure the upgrades function met customer expectations.

Technical Trainings

- Deep Learning Foundations to Stable Diffusion from The University of Queensland
- Essentials of Program Management from Villanova University
- Fast.ai Practical Deep Learning for Coders Part 1 and 2
- Modern Reinforcement Learning: Actor-Critic Algorithms (TD3, DDPG, and SAC)
- Curiosity Driven Deep Reinforcement Learning (A3C, and ICM)
- Statistical Rethinking: A Bayesian Course
- Gas Turbine and Compressor Training Workshop at Southwest Research Institute.
- ANSYS Workbench Mechanical Structural Nonlinearities
- Arduino Step by Step Course from Tech Explorer
- Geometric Dimensioning & Tolerancing Intermediate
- Interpretation & Application ASME Y14.5-2009