Anthony Hoak

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WORK EXPERIENCE

GE HealthCare, Waukesha, WI 53188

- Systems Engineer — Aug 2021 – Present
  - Cardiac Spectral Post Processing (CSPP) Advanced Technology Project (ATP) [GitLab]
    - Developed Bayes classifier in Python using Scikit-learn to classify pixels in dual energy CT images
    - Wrote a Python script to create and review training data for the classifier (NumPy, Pandas, OpenCV, Matplotlib)
  - Intelligent Boundary Registration (IBR) ATP (vessel reg. for cardiact CT images) [GitLab]
    - Wrote C++ code to update DICOM tags and save aorta/coronary masks to be used in the CSPP ATP
    - Prototype built using a Docker container in a virtual machine and evaluated in a container on a Linux workstation
    - Used Python to evaluate IBR IQ (Likert) scores results (using NumPy, Pandas, Matplotlib)
    - Created bash scripts to interface with an image database on a Linux workstation
    - Used Python to create a simple MySQL utility for storing IBR IQ results
  - Snap Shot Freeze 3 (SSF3) ATP (motion correction for cardiact CT images)
    - Benchmarked SSF3 algorithm memory consumption and compute performance
    - Developed bash script(s) to automate testing a Linux workstation
    - Used Python to evaluate results (scripts using NumPy, Pandas, Matplotlib)
    - Created a Python script to separate cardiac DICOM Series based on phase (pydicom)
  - Migrated production Python code for SSF2 from Python2 to Python3 using 2to3 [GitLab]
  - Lead/owned multiple Technical Design Reviews (TDRs) (SSF2, Pluto Interoperability)

Northrop Grumman Corporation, Rolling Meadows, Illinois, USA

- Digital Engineer II — Jan 2020 – Aug 2021
  - Developed embedded software (C) for verifying FPGA requirements
  - Wrote basic accessor and mutator functions in C++ for a military aircraft radar system
- Systems Engineer II (Professional Development Program) — Jan 2017 – Jan 2020
  - Developed, debugged, and validated code in MATLAB, C, and C++

RESEARCH EXPERIENCE

Computer Vision & Sensing Systems Laboratory, Marquette University

- Graduate Student, Electrical & Computer Engineering Department — Nov 2014 – Aug 2016
  - Focus: multi-target tracking, computer vision, statistical (Bayesian) signal processing

PUBLICATIONS

JOURNALS

A. Hoak, H. Medeiros, and R. Povinelli, "Image-Based Multi-Target Tracking through Multi-Bernoulli Filtering with Interactive Likelihoods," *Sensors*, vol. 17, no. 501, Mar 2017.

CONFERENCES

A. Echeverri Guevarra, A. Hoak, J. Tapiero Bernal, and H. Medeiros, "Vision-based Self-contained Target Following Robot using Bayesian Data Fusion," in *International Symposium on Visual Computing*, 2016.

EDUCATION

Marquette University, Milwaukee, Wisconsin, USA

- Master of Science (M.S.) in Electrical & Computer Engineering — Aug 2014 – Aug 2016
  - Cumulative GPA: 3.4 / 4.0
  - Thesis: An Interactive Likelihood for the Multi-Bernoulli Filter
    - Integrated a deep learning technique for pedestrian detection with the Multi-Bernoulli Filter
  - Advisor: Dr. Henry Medeiros
  - Teaching Assistant for Circuits I & II

Milwaukee School of Engineering, Milwaukee, Wisconsin, USA

- Bachelor of Science (B.S.) in Electrical Engineering — Sep 2010 – May 2014
  - Cumulative GPA: 3.3 / 4.0
  - Minors: Mathematics and Physics
  - Internships: Spectrum Brands, Kohler Co., and Johnson Controls Inc.

AWARDS & SCHOLARSHIPS

- Frank Rogers Bacon Research Assistantship, Marquette University — Aug 2014 – May 2016
- Academic Scholarship $8,000/yr., Milwaukee School of Engineering — Sep 2010 – May 2014
- Dean's List, 6 Semesters, Milwaukee School of Engineering — Sep 2010 – May 2014

SKILLS

python, bash, scripting, computer vision, multi-target tracking, signal processing, digital image processing, applied mathematics, probability & statistics, LaTeX, MATLAB, C/C++, technical communication

INTERESTS

cycling, coffee, hiking, camping, music, reading, photography, information theory, signal processing, image processing, mathematics, computer vision