RYAN HARTZELL

I have a passion for imaging science, software engineering, and computing solutions. Imaging system calibration, analysis, and simulation are my primary strengths, as well as the design and implementation of image processing and computer vision algorithms. My work supports space-based remote sensing for space domain awareness applications.

CONTACT

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Just ask!
Greater Boston Area

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SOFTWARE SKILLS

Ratings are from 1 (intro) to 5 (expert)

Scientific Programming

Python/Numpy/Scipy	●●●●●
C++	●●●●
Matlab	●●●●

Specialized Computing

OpenCV	●●●●
Boost	●●●
PyTorch	●●●●
Sklearn	●●●
TensorFlow+Keras	●●
Dask	●●●●
cupy/RAPIDS	●●●
CUDA C/C++ API	●
Cython	●

Visualization

Matplotlib	●●●●●
Jupyter	●●●●●
Streamlit	●●●●
Bokeh	●●●●

Web

HTML/CSS	●●●●
JS/TypeScript	●●●
Angular	●●●
Flask/SocketIO	●●●
Django	●●

Cloud + Services

Docker	●●●●
OpenFaaS	●●●
Kubernetes	●●●
SQL	●●●
S3/Minio	●●●

Software/Tools/Utility

Linux/Unix (Ubuntu, RHEL/CentOS), Bash
Windows, Office, Git/SVN, Azure DevOps
DIRSIG, MODTRAN, STK, Blender

WORK HISTORY

07/2022 - present
Frontier Technology Inc. (FTI)
Intermediate Scientist

06/2018 - 06/2022
Frontier Technology Inc. (FTI)
Junior Scientist

Summer 2017
Harris Corp. (L3Harris)
Imaging Science Intern

Summer 2016
Exelis (L3Harris)
Imaging Science Intern

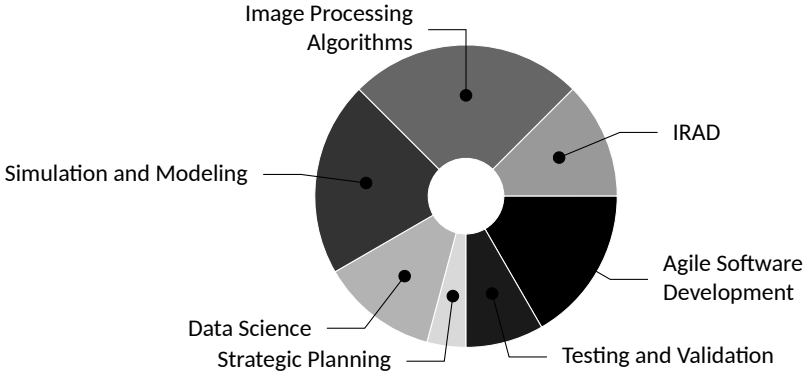
EDUCATION

08/2014 - 05/2018
Rochester Institute of Technology, Rochester NY
B.S. Imaging Science

GENERAL SKILLS

Image Simulation | Sensor Modeling | Space Domain Awareness
Fourier Methods | Computer Vision | Radiometry
Physical Optics | Astronomical Imaging CONOPS | Agile DevOps
Calibration, Characterization, and Design of Imaging Systems
ML/DL | Data Science | Cloud/Accelerated/Distributed Computing
sUAS and Earth Observation Remote Sensing | Object Detection

HOW I SPEND MY TIME AT WORK



WORK HISTORY - DETAILS

FTI, Scientist (Junior, Intermediate)

I directly support space domain awareness (SDA) image processing pipeline development, mission planning, and mission simulation, and interface with software and cloud architecture developers on various solutions for the system. These interactions have included on-site customer support during test events. I've contributed to several Python, Matlab, and C++ tools, and maintain FTI's EOIR Sensor Model and mission simulation stack. Although my academic focus was on earth observation remote sensing, I'm now proficient with various astronomical data pipelines, processing workflows, and domain specific algorithms. A large component of my time at FTI has also been spent proposing and implementing internal research and development (IRAD) efforts and feature updates which have positively impacted our ability to perform work internally and for customers. In recent years I've mentored interns and managed their projects, so I feel comfortable as a mentor.

FTI, SDS IRAD Coordinator

In addition to my primary science role at FTI, I've negotiated an upscope which focuses more of my time on IRAD efforts across the Sensor and Data Services group. This role allows me to design better IRAD processes for our technology stack, and it allows me to guide the strategic direction of our tools and services. Tasks include taking inventory of our group's IP, identifying candidate tools to migrate to FTI's Cortex analytical cloud framework, and propose the necessary IRADs and staffing to complete the work.

Harris Corp. & Exelis (L3Harris), Space and Intelligence Systems, Imaging Science Intern

I worked on automation of the group's remote sensing and DIRSIG scene generation workflows, resulting in a more modular, robust simulation system. Follow up work during my second internship included developing a dynamic visualization system for data evaluation adjacent to the main scene generation workflow, and enveloped all areas of the remote sensing simulation workflow. All of this work was performed in Python.

EDUCATION - DETAILS

Rochester Institute of Technology, B.S. Imaging Science, Remote Sensing Track

Special Topics Course – Small Unmanned Aerial System Remote Sensing I & II
During this senior year project course, I helped develop and test a novel calibration technique for sUAS imagery. The At Altitude Reflectance Ratio allowed for imagery to be calibrated without the use of cumbersome ground targets, as is required by the popular Empirical Line Method approach for vicarious calibration.

Senior Project – Spatio-Temporal Registration of Disparate Videos for 3D Reconstruction
Based on Wang et al.'s VideoSnapping approach, my senior project allowed video from multiple sources in time and space to be synchronized and used to build a scene using a structure-from-motion algorithm. Various sensors (especially of varying quality) and from completely different capture times could then be used to generate a common 3D model result.

</> PERSONAL PROJECTS

ImagePypelines – `https://github.com/jmaggio14/imagepypelines`

One of three lead developers of the ImagePypelines Python library – `https://www.imagepypelines.org/`. The library provides scientists and engineers with an easy interface for code reuse and non-sequential data processing pipeline refactoring, while abstracting logging, debugging, and workflow visualization. The library also allows scientists to remotely monitor their experiments and interact with live python processes on various connected hosts via a dashboard.

PUBLICATIONS & CONFERENCE SLIDES

THE ALL-SKY VISIBLE AND INFRARED ASTRONOMICAL CATALOG ENCOMPASS 3.0

J. Simmerer, T. Murdock, L. Roach, R. Hartzell, B. Muccioli

2020 CalCon 2020: `https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1371&context=calcon`

An initial exploration of vicarious and in-scene calibration techniques for small unmanned aircraft systems

B. Mamaghani, G. Sasaki, R. Connal, K. Kha, J. Knappen, R. Hartzell, E. Marsellus, T. Bauch, N. Raqueno, C. Salvaggio

2018 SPIE DCS, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping III, v. 10664, p. 49-67, DOI 10.1117/12.2302744: `https://doi.org/10.1117/12.2302744` arXiv