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

rah3156@rit.edu
Just ask!
Greater Boston Area

ryanhartzell.github.io
@RyanHartzell
Ryan Hartzell

SOFTWARE SKILLS

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

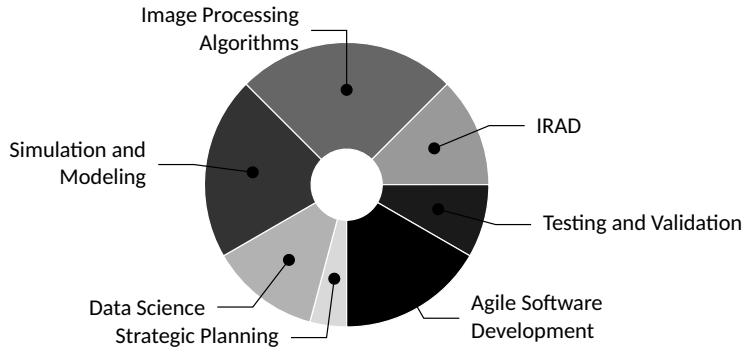
EDUCATION

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

GENERAL SKILLS

Image Simulation and 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



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

Worked on automation of the segment's remote sensing and DIRSIG scene generation workflows, resulting in a more modular, robust simulation system. Follow up work during second internship included developing a visualization system for data evaluation adjacent to the main scene simulation 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
Helped develop and test a novel calibration technique for sUAS imagery. The At Altitude Reflectance Ratio allows 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, video from multiple sources in time or space is 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 can then be used in support of 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.

Bildkedde - `https://github.com/RyanHartzell/Bildkedde`

I maintain this small package in my spare time, mostly for fun and as a sandbox for new ideas. A simple functional CCD/CMOS sensor model is implemented, as well as a class-based interface for image chain construction. The interface supports construction of a sensor model and (basic) image simulation engine in Python, with a focus on interpretablility and modularity of the image chain.

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, arXiv
DOI 10.1117/12.2302744: `https://doi.org/10.1117/12.2302744`