

AMIR HASSANZADEH

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SUMMARY

Scientist with five years of experience in remote sensing, signal/image processing, computer vision, machine learning and deep learning. Enjoy problem solving in collaborative and diverse teams where data scientists and software engineers work together. Available for a fulltime position in April - July 2022 timeframe.

EDUCATION

Expected Graduation April - July 2022	Ph.D. in IMAGING SCIENCE Center for Imaging Science, Rochester Institute of Technology Thesis Title: On the Use of Imaging Spectroscopy from UAS to Model Yield and Assess Growth Stages of a Broadacre Crop
SEP 2011 - JUL 2016	B.S. in CHEMICAL ENGINEERING Faculty of Engineering, University of Guilan, Iran Thesis Title: Numerical Simulation of Oil Extraction from Plants

EXPERIENCE

JUL 2021 - OCT 2021	MACHINE LEARNING INTERN · AGERpoint Crop damage evaluation via remotely sensed data. <ul style="list-style-type: none">Developed 5 well-documented Python packages assessing crop damage with high accuracy.Built an end-to-end Python pipeline for object detection (MaskRCNN) in Pytorch.Developed an algorithm for evaluating crop damage assessment using image classification (ResNet) of UAS data in Keras.Intricately tied remote sensing libraries with (GDAL, RasterIO, Shapely, GeoPandas) with image processing and computer vision libraries (OpenCV, Scipy, Scikit-image, Matplotlib, Pandas).Communicated with business clients frequently regarding their needs.Collaborated frequently with other scientists in the team for brainstorming and problem-solving.
JUN 2020 - SEP 2020	REMOTE SENSING INTERN · PrecisionHawk Responsible for 3 projects on semantic segmentation, lidar point cloud classification, and time series data classification using Machine Learning. <ul style="list-style-type: none">Built and proposed a LiDAR point cloud classification model based on PointCNN in Tensorflow for segmentation of large-scale UAV point clouds (LAS), which was submitted as an ideal substitute for third-party contractors. Sped up processes in Python using scripts in C.Developed easy-to-use Python packages for data analysts, requiring minimal coding experience.Built a semantic segmentation package in Pytorch for inventory assessment in the energy section with >90% accuracy. Product helped increase the efficacy of pipelines in the data services team and automated 70-80% of manual tasks.Designed a video classification model (time-series data) in Pytorch (CRNN; recurrent networks) for gas leakage detection and achieved 80% accuracy.Took advantage of data augmentation (ImgAug) techniques to improve input training data.Extensively used GIS softwares including QGIS, Cloud Compare, and LASTools.Maintained produced packages via Git version control.
JUN 2017 - Current	GRADUATE RESEARCH ASSISTANT · Center for Imaging Science, RIT Responsible for assessment of yield and harvest of a broad acre using imaging spectroscopy. <ul style="list-style-type: none">Managed and conducted UAV and ground truth data collection, data configuration, while collaborating with farmers and pilots.Responsible for data calibration, cleaning, preprocessing, and modelling.Extensively utilized GIS softwares (Envi, QGIS, Pix4D).Developed and released a feature selection library for data sciences on Github in Python, including nine optimization algorithms. Library seamlessly interacts with Scikit-learn classification and regression models.Engineered a deep learning architecture using Memory Networks (Pytorch) for hyperspectral denoising. Conducted a benchmarking study against the state-of-the art.Executed a two-month greenhouse yield study from the ground-up including design of device and experiment, data collection, analysis, and conducting a report.Conducted a summer project on cloud height estimation using Landsat TIRS data.Developed a computer vision algorithm for plant count assessment using RGB and Multispectral data with 80% accuracy. Funded by Love-beets USA. GRADUATE TEACHING ASSISTANT · Center for Imaging Science, RIT <ul style="list-style-type: none">Conducted a two-week workshop on "Deep Learning for Hyperspectral Imagery" in Advanced Environmental Applications of Remote Sensing course.Mentored a master's student on their capstone project.Held office hours, helped undergraduate students with their coding problems, and graded exams.

SKILLS

- **Deep Learning Frameworks:** PyTorch, Tensorflow, Keras
- **Scientific Computing Packages:** Numpy, Scipy, OpenCV, Scikit-learn, Pandas, Geopandas, RasterIO, Shapely, GDAL, pptk, Cmake, ImgAug
- **Programming (Proficient):** Python
- **Programming (Basic/Past):** C, C++, MATLAB
- **Software/others:** Git, LATEX, QGIS, Cloud Compare, ENVI, ArcGIS, LAStools, Pix4D, LaTeX, Office, Photoshop, InDesign, Microsoft Office

PUBLICATIONS

TBD	Hassanzadeh, A. & van Aardt, J. Hyperspectral Denoising Using Generative Adversarial Networks. <i>Under Preparation</i>
TGRS	Hassanzadeh, A., Zhang, F., Murphy, S. P., Pethybridge, S. J., & van Aardt, J. (2021). Toward Crop Maturity Assessment via UAS-based Imaging Spectroscopy - A Snap Bean Pod Size Classification Field Study. <i>TGRS, Under Review</i>
RS	Hassanzadeh, A., Zhang, F., van Aardt, J., Murphy, S. P., & Pethybridge, S. J. (2021). Broadacre crop yield estimation using imaging spectroscopy from unmanned aerial systems (UAS): A field-based case study with snap bean. <i>Remote Sensing</i> , 13(16), 3241.
RS	Zhang, F., Hassanzadeh, A., Kikkert, J., Pethybridge, S. J., & van Aardt, J. (2021). Comparison of UAS-Based Structure-from-Motion and LiDAR for Structural Characterization of Short Broadacre Crops. <i>Remote Sensing</i> , 13(19), 3975.
RS	Hassanzadeh, A., Murphy, S. P., Pethybridge, S. J., & van Aardt, J. (2020). Growth Stage Classification and Harvest Scheduling of Snap Bean Using Hyperspectral Sensing: A Greenhouse Study. <i>Remote Sensing</i> , 12(22), 3809.
JARS	Hassanzadeh, A., van Aardt, J., Murphy, S. P., & Pethybridge, S. J. (2020). Yield modeling of snap bean based on hyperspectral sensing: a greenhouse study. <i>Journal of Applied Remote Sensing</i> , 14(2), 024519

CONFERENCE PAPERS & TALKS

SciPy	Hassanzadeh, A., van Aardt, J. (2021). <i>Jostar</i> : A Feature Selection Library for Data Sciences in Python. SciPy 2021 [github.com/amirhszd/jostar]
IGARSS	Hassanzadeh, A., van Aardt, J., Kikkert, J., Pethybridge, S. J., Murphy, S. P., Cross, D. (2021). Plant Counts in Dense Red Beet Crops: A Computer Vision Approach. IGARSS, 6508-6511
AGU	Hassanzadeh, A., van Aardt, J., Zhang, F., Murphy, S. P., Pethybridge, S. J. (2021). Multi-objective Wavelength Selection for Snap-bean Yield Assessment Using Remote Sensing: A Field Study. AGU Fall Meeting Abstracts, B004-0006
IGARSS	Zhang, F., Hassanzadeh, A., Kikkert, J., Pethybridge, S. J., van Aardt, J. (2020). Toward a Structural Description of Row Crops Using UAS-Based LiDAR Point Clouds. IGARSS, 465-468

HONORS & AWARDS

- Top third (among 20 students) in Ph.D. qualification exam.
- Top 2% (among 300,000 candidates) in undergraduate university entrance exam.
- Top student (among 90 students) in undergraduate level for three consecutive semesters.

PROFESSIONAL SERVICES

• Journal Reviewing	
Plant Disease Journal	2021
Field Crop Research	2021
Journal of Applied Remote Sensing (JARS)	2021
Journal of Open Source Software (JOSS)	2021
Journal of Supercomputing (SUPE)	2020, 2021
• Conference Reviewing	
International Geoscience and Remote Sensing Symposium (IGARSS)	2020, 2021
Scientific Computing with Python (SciPy)	2021