TONIAN ROBINSON

Geophysicist, Remote Sensing Scientist

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- 6 years in Remote Sensing and Geospatial applications
- 8 years in Near-Surface Geophysics, with proficiency in GPR and ERT
- Proficient in quantitative analytical research using ESRI ArcGIS, Python, and MATLAB
- Experienced processing satellite imagery (SAR), time series, statistical and geospatial analysis

SKILLS

- Remote Sensing
- Scientific Computing
- Research & Development
- Technical Writing
- Statistical Data Analysis
- Geospatial Analysis
- Imagery Analyst
- Data Management

EXPERIENCE

06/2017 – PRESENT **Research & Teaching Assistant**
University of South Florida – Tampa, FL

- Created and updated existing MATLAB and python to complete the InSAR time series analysis in open source software tools (ISCE2, StaMPS, MintPy)
- Design, prototype, and implement statistical models to explore temporal dynamics in InSAR time series and characterized patterns related to sinkhole formation
- Transform and visualized raster and vector datasets using Python (GDAL, Rasterio, GeoPandas)
- Compute the digital signal processing of InSAR velocities to delineate local and regional subsidence
- Conducted various spatial and raster analyses, aerial photography feature extraction and geo-referencing, and SQL querying of geospatial datasets using ESRI ArcGIS
- Evaluated the effects of high resolution DSMs from LiDAR point clouds (laz and las) on time series results from satellite interferometry (applied NOAA Vdatum and ArcGIS for LiDAR to DSM conversions)
- Completed the removal of atmospheric phase screen from InSAR datasets from MODIS HDF5 datasets using GDAL and StaMPS
- Integrate and optimize geospatial data processing and analysis workflows in High-Performance Computing Cluster and OpenSARLab (located in Amazon Web Services (AWS))
- Created surfaces from UAV-derived Structure from Motion (SfM) and Terrestrial LiDAR datasets using Agisoft Metashape and Cloud Compare, respectively
- Perform interactive webpage development using JavaScript, HTML, CSS and p5
- Collected, processed, analyzed and interpreted GPR, Seismic refraction and ERT datasets
- Designed and created educational materials to supplement lesson plans for courses: Dynamic Earth, Intro to Physical Geology, Intro to Environmental Science, Geophysics
- Guided ~80 undergraduates in Resistivity data collection and processing and technical report writing
- Led an unofficial introduction to InSAR Course, where 5 Graduate students were introduced to processing InSAR datasets with the UNAVCO 2020 InSAR course materials

06/2021 – 06/2022 **Summer Geophysics Instructor**
Newark, NJ & Fort Valley, GA

- Guided 13 students in GPR data collection, processing, and interpretation in the Critical Zone Observatory (Rothrock State Forest, Pennsylvania). *Rutgers State University – Newark, NJ*
- Led the instruction of GPR and Resistivity, data collection, and processing for 6 Fort Valley State University undergraduates. *IRIS Consortium (now Earthscope Consortium) – Fort Valley, GA*

10/2014 – 06/2017 **Research Assistant**
Rutgers State University – Newark, NJ

- Assembled and calibrated apparatus for laboratory Spectral Induced Polarization (SIP) measurements, surface area analysis using the Brunauer- Emmett-Teller (BET) method, pore size distributions from mercury injection capillary pressure (MICP) porosimetry and mineral composition of the samples using the X-ray Powder Diffraction (XRD) method.
- Signal processing of SIP data using MATLAB

- Resulted in 3 peer-reviewed publications.

EDUCATION

08/2017 – 05/2023 **Ph.D.: Geophysics**
University of South Florida – Tampa, FL
- Led 3 geospatial projects focused on land subsidence using Remote Sensing (LiDAR, SfM), satellite radar (Sentinel1A and TerraSAR-X) and Near Surface Geophysics (GPR, ERT) applications.

09/2012 – 06/2017 **B.S.: Geology**
Rutgers State University – Newark, NJ
- Undergraduate Research Assistant for ~3 years
- Dean's List Spring 2015 and Spring & Fall, 2016

ACCOMPLISHMENTS

- Authored 9 & co-authored 8 scientific conference presentations
- Awarded over $90,000 in scholarship funding

CERTIFICATIONS

- NASA ARSET: Disaster Assessment Using Synthetic Aperture Radar (2022)
- NASA ARSET: Monitoring and Modeling Floods using Earth Observations (2022)
- C++ Programming from Beginner to Beyond (Udemy) (2022)
- GETSI Teaching in the field with SfM and RTK GPS/GNSS (2021)
- UNAVCO InSAR Processing and Time-Series Analysis for Geophysical Applications: InSAR Scientific Computing Environment (ISCE), ARIA Tools, and MintPy (2020)
- Seismic Surface Wave Short Course, Park Seismic LLC (2019)

SOFTWARE & PROGRAMMING

- Python: GDAL, GeoPandas, Rasterio, Jupyter Notebooks, Matplotlib, NumPy, Pandas
- MATLAB
- ArcGIS, ArcMap, QGIS
- High-Performance Computing (HPC)
- LINUX/UNIX
- C++, SQL (SQLite, ArcGIS)
- Generic Mapping Tools (GMT)
- Google Earth Engine (GEE)
- JavaScript, HTML5, p5, CSS, Adobe Illustrator
- Cloud Compare, Agisoft Metashape
- ReflexW, RES2DINV, RESIPy
- Ground Penetrating Radar (GPR), Electrical Resistivity Tomography (ERT), Seismic

WRITING & PRESENTATIONS

Robinson, T., T. Dixon, S. Kruse, 2022, Persistent Scatterer Time Series Analysis of Subsidence in the Tampa Bay Region. AGU Fall Meeting Abstracts 2022, EP55C-0828

Oliver-Cabrera, T., Wdowinski, S., Kruse, S., Robinson, T., 2022. Detection of sinkhole activity in West-Central Florida using InSAR time-series observations. Remote Sensing of Environment. https://doi.org/10.1016/j.rse.2021.112793

Robinson, T., Rodgers, B., Oliver-Cabrera, T., Downs, C., Kruse, S., Wdowinski, S., Zhang, B., Jazayeri, S., Esmaeili, S., Kiflu, H., 2021. Complex relationships between surface topography, ground motion, and cover sediments in covered karst, west-central Florida, USA. Geomorphology 392, 107927. https://doi.org/10.1016/j.geomorph.2021.107927

Robinson, J., Slater, L., Weller, A., Keating, K., Robinson, T., Rose, C., et al. (2018). On permeability prediction from complex conductivity measurements using polarization magnitude and relaxation time. Water Resources Research, 54, 3436–3452. https://doi.org/10.1002/2017WR022034