

Bijan Seyednasrollah, Ph.D.

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US Work Authorization / Residency Status: US Permanent Resident (Green Card Holder)

HIGHLIGHTS

- Multi-disciplinary data scientist and engineer with 17+ years of experience in computational methods including leadership roles
- Proficient in computational and data analyses, machine learning, image processing, and mathematical modeling
- Proficient developer in multiple platforms and programming languages and packages, e.g., R, Python, C/C++, Fortran, Shiny, GDAL
- Organized and taught technical quantitative workshops for lay and technical audience at professional meetings and universities
- Strong writing skills as proven in over 20 publications in top peer-reviewed journals of quantitative topics
- Strong communication skills as proven in presentations for lay and technical audience at professional meetings
- Strong connections with the academic community in science and engineering in leading universities and national labs
- Refereed 60+ articles for top peer-reviewed journals in quantitative science, modeling and remote sensing

EDUCATION

Ph.D. in Quantitative Environmental Science , Duke University, Durham, NC, USA	2017
M.Sc. in Mechanical Engineering (Computational Methods) , Sharif University of Technology, Iran	2006
B.Sc. in Mechanical Engineering (Numerical Modeling) , University of Semnan, Iran	2003
Certificate: IBM Data Science Professional (9 Courses on Machine Learning and Visualization in Python and SQL)	2020
Certificate: Data Science Foundations using R Specialization by Johns Hopkins University (5 Courses in R)	2016

SKILLS

Programming and Scripting:

- R, Python, C/C++/C#, Markdown, MATLAB, Python, Mathematica, Java, VBA, Fortran, Shell, HTML/CSS
- Object Oriented Programming (OOP), High Performance Computing (HPC), Multithreaded Programming

Quantitative, Geospatial and Visualizations:

- Hierarchical Modeling, Bayesian Statistics, Markov Chain Monte Carlo (MCMC), Optimizations
- Machine Learning, Deep Learning, Neural Network,
- GIS, Geospatial Analysis, Remote Sensing, Data Elevation Model (DEM) Processing, Image Processing
- GDAL, ggplot2, data.table, dplyr, Shiny, NumPy, SciPy, Pandas, Scikit-learn, Matplotlib, TensorFlow, Keras

PROFESSIONAL EXPERIENCE

Environmental Data Scientist / Geospatial Image Scientist

Harvard University / Northern Arizona University (PhenoCam Network)

- Led data management of the PhenoCam network, 40+ million images from 650+ sites around the globe
- Designed data pipeline for translating raw data to curated, quality checked, and processed final products
- Developed image/data processing routines in R/Python to extract meaningful insight from variety of data types including: Digital images, hyperspectral, Rasters, Shapefiles, JSON, geoJSON, LiDAR, surveyed data, HDF, ...
- Developed Machine Learning methods and applied Deep Learning routines to extract insight from digital images
- Regularly communicated with 250+ in-site scientists and technicians globally to assure high quality data stream
- Developed web-based applications for interactive image processing and environmental science
- Developed R packages including *xROI*, *solrad*, *phenocamapi*, *hazer* for data and image processing, 30,000+ downloads
- Organized technical workshops on image processing and quantitative methods

2017-now

Doctoral Research Assistant / Quantitative Environmental Scientist

Duke University, Nicholas School of the Environment

- Designed and developed hierarchical models to study climate change impacts across the U.S. using satellite imagery
- Developed nationwide drought monitoring interface using satellite data
- Developed physics-based models (FoRM and GaRM) in C/C++/MATLAB to quantify energy fluxes in watersheds

2011-2017

Senior Researcher / Research and Development Engineer

Research Institute of Petroleum Industry, Department of Energy and Environment, Iran

- Developed a 3D model of multiphase flow in porous media in C/C++ to simulate oil/gas reservoirs
- Developed Energy Performance and Assessment Tools in C# to audit energy in power plants
- Developed Pars Basin Modeler (PBM) in C/C++/Fortran to model sedimentary basins

2006-2011

Director of Mechanical Engineering Magazine

Iranian Society of Mechanical Engineers (ISME)

- Managing the team of editors and staff for the review/publication process
- Editing and reviewing scientific articles
- Preparing Educational Materials for Population and Environment Course

2004-2007

AWARDS

NASA Advanced Information Systems Technology , National Aeronautics and Space Administration	2020
ESA Early Career Scholar Award , Ecological Society of America	2019
NEON Data Institute Fellowship , National Ecological Observatory Network	2018
Outstanding Accomplishments Fellowship , Duke University	2017
Pathfinder Fellowship , The Consortium for the Advancement of Hydrologic Science Inc. (CUAHSI)	2014

SELECTED PUBLICATIONS

- Seyednasrollah, B.** and J. S. Clark (2020), "Where resource-acquisitive species are located: The role of habitat heterogeneity", *Geophysical Research Letters*. e2020GL087626. doi:10.1029/2020GL087626.
- Seyednasrollah, B.**, A. M. Young, X. Li, T. Milliman, T. Ault, S. Frolking, M. Friedl, A. D. Richardson (2020) "Sensitivity of deciduous forest phenology to environmental drivers: Implications for climate change impacts across North America", *Geophysical Research Letters*, 47, e2019GL086788.
- Seyednasrollah, B.**, A. M. Young, K. Hufkens, T. Milliman, M. A. Friedl, S. Frolking and A. D. Richardson (2019), "Tracking vegetation phenology across diverse biomes using PhenoCam imagery: The PhenoCam dataset v2.0", *Scientific Data*, Volume 6, 22
- Seyednasrollah, B.**, T. Milliman and A. D. Richardson (2019), "Data extraction from digital repeat photography using xROI: An interactive framework to facilitate the process", *ISPRS Journal of Photogrammetry and Remote Sensing*, Volume 152, June 2019, Pages 132-144
- Seyednasrollah, B.**, J. C. Domec and J. S. Clark (2019), "Spatiotemporal sensitivity of thermal stress for monitoring canopy hydrological stress in near real-time", *Agricultural and Forest Meteorology*, Volumes 269270, 15 May 2019, Pages 220-230.
- Seyednasrollah, B.**, J. J. Swenson, J. C. Domec and J. S. Clark (2018), "Leaf phenology paradox: Why warming matters most where it is already warm", *Remote Sensing of Environment*, Volume 209, May 2018, Pages 446-455, ISSN 0034-4257.

OPEN-SOURCE SOFTWARE

- Seyednasrollah, B.**, D. Basler, S. Beals, J. Beasley, A. Greene, J. Kelroy, M. S. Carbone, and A. D. Richardson (2018), "FluxPuppy: Android interface to Licor LI-820 and LI-840 gas analyzers", Zenodo. <http://doi.org/10.5281/zenodo.1438548>.
- Seyednasrollah, B.**, T. Milliman and A. D. Richardson (2018), "xROI: A toolkit to delineate region of interests (ROI's) and extract time-series data from digital repeat photography images", Zenodo. <http://doi.org/10.5281/zenodo.1202273>.
- Seyednasrollah, B.**, J. J. Swenson, J. C. Domec, J. S. Clark (2018), "phenoCDM: Continuous development models for incremental time-series analysis", Zenodo. <http://doi.org/10.5281/zenodo.1204614>.
- Seyednasrollah, B.** (2017), "drawROI: An interactive toolkit to extract phenological time series data from digital repeat photography", Zenodo. <http://doi.org/10.5281/zenodo.1066588>.
- Seyednasrollah, B.** (2017), "hazer: Quantifying haze factor for RGB images to identify cloudy and foggy weather", Zenodo. <http://doi.org/10.5281/zenodo.1008568>.
- Seyednasrollah, B.** (2016), "solrad: To calculate solar radiation and related variables based on location, time and topographical conditions", Zenodo. <http://doi.org/10.5281/zenodo.1249673>.

SCIENTIFIC REFREE

Actively refereed scientific articles for the following peer-reviewed journals:

Nature Climate Change (x4), Scientific Data, Science of the Total Environment (x2)

Geophysical Research Letters, Frontiers in Ecology and the Environment

Journal of Geophysical Research: Atmospheres, Journal of Geophysical Research: Biogeosciences, EGU Biogeosciences (x3)

Agricultural and Forest Meteorology (x7), Remote Sensing of Environment (x3), Methods in Ecology and Evolution

ISPRS Journal of Photogrammetry and Remote Sensing (x2), ISPRS International Journal of Geo-Information

International Journal of Digital Earth, Climate Research, Ecosphere, Solid Earth, Remote Sensing (x5)

Water (x9), Forests (x2), Atmosphere (x3), Sustainability (x5), Forecasting (x2), Data (x2)

Geosciences, Entropy, Applied Sciences, Asia-Pacific Journal of Chemical Engineering