

# Bijan Seyednasrollah, Ph.D.

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

HIGHLIGHTS	<ul style="list-style-type: none"> <li>- Multi-disciplinary data scientist and engineer with 17+ years of experience in computational methods</li> <li>- Leading the PhenoCam Data Team: 40+ million camera images + two million new images per month</li> <li>- Proficient in numerical analysis, data analysis, machine learning, image processing, and mathematical modeling</li> <li>- Proficient developer in multiple platforms and programming languages, e.g., R, Python, C/C++, Fortran, Shiny</li> <li>- Developed several R-packages on image processing, statistics, and data wrangling, with 30,000+ downloads</li> <li>- Developed several web-based geospatial and image processing applications based on R Shiny</li> <li>- Organized and taught technical quantitative workshops for lay and technical audience at professional meetings and universities</li> <li>- Strong communication skills as proven in presentations for lay and technical audience at professional meetings</li> <li>- Strong connections with the academic community in science and engineering in leading universities and national labs</li> <li>- Strong writing skills as proven in over 20 publications in top peer-reviewed journals of quantitative topics</li> <li>- Refereed 60+ articles for top peer-reviewed journals in quantitative science, modeling and remote sensing</li> </ul>
EDUCATION	<p><b>Ph.D. in Quantitative Environmental Science</b>, Duke University, Durham, NC, USA 2017</p> <p><b>M.Sc. in Mechanical Engineering (Computational Methods)</b>, Sharif University of Technology, Iran 2006</p> <p><b>B.Sc. in Mechanical Engineering (Numerical Modeling)</b>, University of Semnan, Iran 2003</p>
CERTIFICATES	<p><b>IBM Data Science Professional Certificate (9 Courses and Capstone Project in Python and SQL)</b>          Fundamentals, Methodology, Data Analysis, Machine Learning, Visualizations, and Databases using Python and SQL</p> <p><b>Data Science: Foundations using R Specialization by Johns Hopkins University (5 Courses in R)</b></p>
PROFESSIONAL EXPERIENCE	<p><b>Environmental Data Scientist / Geospatial Image Scientist</b> 2017-          Harvard University / Northern Arizona University (PhenoCam Network)</p> <ul style="list-style-type: none"> <li>- Leading data management of the PhenoCam network, a total of 40+ million images from 650+ sites around the globe: <a href="https://doi.org/10.3334/ORNDAAC/1674">https://doi.org/10.3334/ORNDAAC/1674</a></li> <li>- Designed data pipeline for translating raw data to curated, quality checked, and processed final products</li> <li>- 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, ...</li> <li>- Developed Machine Learning methods and applied Deep Learning routines to extract insight from digital images</li> <li>- Regularly communicated with 250+ in-site scientists and technicians globally to assure high quality data stream</li> <li>- Developed web-based applications for interactive image processing and environmental science:            DrawROI App: <a href="http://phenocam.nau.edu/drawroi/">http://phenocam.nau.edu/drawroi/</a>            Tree Ring Image Analysis and Database: <a href="http://phenocam.nau.edu/triad">http://phenocam.nau.edu/triad</a></li> <li>- Developed R packages including <i>xROI</i>, <i>solrad</i>, <i>phenocamapi</i>, <i>hazer</i> for data and image processing</li> <li>- Organized technical workshops on image processing and quantitative methods.            e.g., <a href="https://www.neonscience.org/agu-2018-phenocam">https://www.neonscience.org/agu-2018-phenocam</a></li> </ul> <p><b>Doctoral Research Assistant / Quantitative Environmental Scientist</b> 2011-2017          Duke University, Nicholas School of the Environment</p> <ul style="list-style-type: none"> <li>- Designed and developed hierarchical state-space models to study climate change impacts across the U.S. using daily MODIS remotely sensed reflectance imagery</li> <li>- Developed nationwide drought monitoring interface using satellite data: <a href="https://bnasr.github.io/droughtteye">https://bnasr.github.io/droughtteye</a></li> <li>- Developed physics-based models (FoRM and GaRM) to quantify energy fluxes in watersheds</li> <li>- Served as Teaching Assistant for course "GIS for Water Quantity and Quality Assessment"</li> </ul> <p><b>Senior Researcher / Research and Development Engineer</b> 2006-2011          Research Institute of Petroleum Industry, Department of Energy and Environment, Iran</p> <ul style="list-style-type: none"> <li>- Developed a 3D model of multiphase flow in porous media in C/C++ to simulate oil/gas reservoirs</li> <li>- Developed Energy Performance and Assessment Tools in C# to audit energy in power plants</li> <li>- Developed Pars Basin Modeler (PBM) in C/C++/Fortran to model sedimentary basins</li> </ul>
SKILLS	<p><b>Programming and Scripting:</b></p> <ul style="list-style-type: none"> <li>- R, Python, C/C++/C#, Markdown, MATLAB, Python, Mathematica, Java, VBA, Fortran, Pascal, Shell, HTML/CSS</li> <li>- Object Oriented Programming (OOP), High Performance Computing (HPC), Multithreaded Programming</li> </ul> <p><b>Quantitative, Geospatial and Visualizations:</b></p> <ul style="list-style-type: none"> <li>- Hierarchical Modeling, Bayesian Statistics, Markov Chain Monte Carlo (MCMC), Optimizations</li> <li>- Machine Learning, Deep Learning, Neural Network</li> <li>- GIS, Geospatial Analysis, Remote Sensing, Data Elevation Model (DEM) Processing, Image Processing</li> </ul>

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”, <i>Geophysical Research Letters</i> . 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”, <i>Geophysical Research Letters</i> , 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”, <i>Scientific Data</i> , 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”, <i>ISPRS Journal of Photogrammetry and Remote Sensing</i> , 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”, <i>Agricultural and Forest Meteorology</i> , 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”, <i>Remote Sensing of Environment</i> , 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. <a href="http://doi.org/10.5281/zenodo.1438548">http://doi.org/10.5281/zenodo.1438548</a> .		
	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. <a href="http://doi.org/10.5281/zenodo.1202273">http://doi.org/10.5281/zenodo.1202273</a> .		
	Seyednasrollah, B., J. J. Swenson, J. C. Domec, J. S. Clark (2018), “phenoCDM: Continuous development models for incremental time-series analysis”, Zenodo. <a href="http://doi.org/10.5281/zenodo.1204614">http://doi.org/10.5281/zenodo.1204614</a> .		
	Seyednasrollah, B. (2017), “drawROI: An interactive toolkit to extract phenological time series data from digital repeat photography”, Zenodo. <a href="http://doi.org/10.5281/zenodo.1066588">http://doi.org/10.5281/zenodo.1066588</a> .		
	Seyednasrollah, B. (2017), “hazer: Quantifying haze factor for RGB images to identify cloudy and foggy weather”, Zenodo. <a href="http://doi.org/10.5281/zenodo.1008568">http://doi.org/10.5281/zenodo.1008568</a> .		
	Seyednasrollah, B. (2016), “solrad: To calculate solar radiation and related variables based on location, time and topographical conditions”, Zenodo. <a href="http://doi.org/10.5281/zenodo.1249673">http://doi.org/10.5281/zenodo.1249673</a> .		
SELECTED MEDIA COVERAGE	KNAU Arizona Public Radio: <i>Earth Notes: Drought Eye</i> <a href="https://www.knau.org/post/earth-notes-drought-eye/">https://www.knau.org/post/earth-notes-drought-eye/</a>		June 26, 2019
	LTER Network Science Update: <i>Keeping an eye out for drought</i> <a href="https://lternet.edu/stories/eye-out-for-drought/">https://lternet.edu/stories/eye-out-for-drought/</a>		May 29, 2019
	Weather Nation: <i>A Faster and More Accurate Way to Monitor Drought</i> <a href="http://www.weathernationtv.com/news/a-faster-and-more-accurate-way-to-monitor-drought/">http://www.weathernationtv.com/news/a-faster-and-more-accurate-way-to-monitor-drought/</a>		March 13, 2019
	Science Daily: <i>Thermal Stress Measurements Sound the Alarm About Drought Conditions Sooner</i> <a href="https://www.sciencedaily.com/releases/2019/03/190304154858.htm">https://www.sciencedaily.com/releases/2019/03/190304154858.htm</a>		March 4, 2019
	World Economic Forum: <i>These new maps could tell us where in the US is most at risk from drought</i> <a href="https://www.weforum.org/agenda/2019/3/free-drought-eye-maps-depict-thermal-stress/">https://www.weforum.org/agenda/2019/3/free-drought-eye-maps-depict-thermal-stress/</a>		March 12, 2019
	PhysOrg: <i>Flux Puppy: Ecological app for measuring carbon dioxide</i> <a href="https://phys.org/news/2019-05-flux-puppy-ecological-app-carbon.html">https://phys.org/news/2019-05-flux-puppy-ecological-app-carbon.html</a>		May 21, 2019
SCIENTIFIC REFeree	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		
REFERENCES	<b>Dr. Christina Schädel</b> <b>Research Professor</b> Center for Ecosystem Sciences and Society Northern Arizona University, Flagstaff, AZ 86011 +1 (405) 371-3350, <a href="mailto:christina.schaedel@nau.edu">christina.schaedel@nau.edu</a>		<b>Dr. Adam Young</b> <b>Research Scientist</b> School of Informatics, Computing, and Cyber Systems Northern Arizona University, Flagstaff, AZ 86011 +1 (610) 360-2934, <a href="mailto:adam.young@nau.edu">adam.young@nau.edu</a>