Bijan Seyednasrollah

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Academic appointments

Associate of the Department of Organismic and Evolutionary Biology *April 2017 - present*
Harvard University

PhenoCam Postdoctoral Data Science Fellow *May 2017 - present*
Harvard University, Department of Organismic and Evolutionary Biology/
Northern Arizona University, School of Informatics, Computing, and Cyber Systems

Education

Ph.D. in Environment *2011 - 2017*
Duke University, Durham, NC
Dissertation: Ecosystem response to a changing climate: vulnerability, impact and monitoring
Advisor: Jim Clark, Committee: Jean-Christophe Domec, Alan Gelfand, and Jennifer Swenson.

Certificate in College Teaching (CCT) *2017*
Duke University, Durham, NC

M.Sc. in Mechanical Engineering, Energy Conversion *2004-2006*
Sharif University of Technology, Tehran, Iran
Thesis: Three-dimensional simulation of multi-phase flow in porous media using a fully implicit approach

B.Sc. in Mechanical Engineering, Heat and Fluid Flow *1999-2003*
University of Semnan, Semnan, Iran
Thesis: Modeling and verification of steady-state control time in convectional heat transfer

Selected Peer-reviewed Publications

B. Seyednasrollah, J. S. Clark (2018) *"Nutrient-demanding species and drought vulnerability: the role of habitat heterogeneity"*, in review.

B. Seyednasrollah, J. C. Domec, J. S. Clark (2018). *"Remotely sensed canopy thermal stress to monitor droughts in near real-time "*, in review.

B. Seyednasrollah, J. J. Swenson., J. C. Domec, J. S. Clark (2018) *"Phenology paradox: why warming matters most where it is already warm"*, Remote Sensing of Environment.

J. S. Clark, D. Nemergut, **B. Seyednasrollah**, P. Turner, and S. Zhang (2017). *"Generalized joint attribute modeling for biodiversity analysis: Median-zero, multivariate, multifarious data"*, in Ecological Monographs, doi:10.1002/ecm.1241

B. Seyednasrollah, and M. Kumar (2014). *"Net radiation in a snow-covered discontinuous forest gap for a range of gap sizes and topographic configurations"*, in J Geophys Res-Atmos, 119, 10,32310,342. doi:10.1002/2014JD021809.

B. Seyednasrollah, and M. Kumar (2013). *"Effects of tree morphometry on net snowcover radiation on forest floor for varying forest densities"*, in J Geophys Res-Atmos, 118, 12,50812,521, doi:10.1002/2012JD019378.

B. Seyednasrollah, M. Kumar, and T. E. Link (2013). *"On the role of vegetation density on net snow cover radiation at the forest floor"*, in J. Geophys. Res. Atmos, 118, 83598374, doi:10.1002/jgrd.50575.

B. Seyednasrollah, R. M. Khorsani, M. T. Manzari and S. K. Hannani (2010). *"Dimensional numerical simulation of hydrocarbon reservoirs using a black oil model implicit finite difference method"*, in Sharif Journal of Mechanical Engineering, Vol. 26, No. 1.

B. Seyednasrollah, F. Talebi and F. Yousefi (2009). *"Analysis and optimization of reducing steady state time for heating systems"*, in International Journal Of Advanced Design And Manufacturing Technology, Vol. 2 No. 2.

Published Open-source Models and Packages

B. Seyednasrollah *"drawROI: An interactive toolkit to extract phenological time series data from digital repeat photography (Version v1.0.2)"*. Zenodo. http://doi.org/10.5281/zenodo.1066588

B. Seyednasrollah *"hazer: Quantifying haze factor for RGB images to identify cloudy and foggy weather (Version v1.0.0)"*, Zenodo. http://doi.org/10.5281/zenodo.1008568, 2017.

B. Seyednasrollah *"calcSolar: Solar position and radiation components (Version v1.0.0)"*, Zenodo. http://doi.org/10.5281/zenodo.1006384, 2016.

B. Seyednasrollah *"GaRM: A Forest Gap Radiation Model"*, Zenodo. http://doi.org/10.5281/zenodo.840998, 2014.

B. Seyednasrollah *"FoRM: A physically based forest radiation model "*, Zenodo. http://doi.org/10.5281/zenodo.841001, 2014.

Conference Talks, Poster and Presentations

B. Seyednasrollah, T. E. Milliman, K. Hufkens, M. Kosmala, A. D. Richardson *"An interactive toolkit to extract phenological time series data from digital repeat photography"*, American Geophysical Union Fall Meeting 2017, New Orleans, LA.

B. Seyednasrollah (invited), J. Clark, *"Understanding Phenology across Scales and Improving Linkages to Ecosystem Functions"*, American Geophysical Union Fall Meeting 2015, San Francisco, CA.

B. Seyednasrollah, J. Clark, *"Attributing the effects of climate on phenology change suggests high sensitivity in coastal zones"*, American Geophysical Union Fall Meeting 2015, San Francisco, CA.

J. Clark, A. Berdanier, **B. Seyednasrollah**, Brad Tomasek, *"Forecasting the forest and the trees: consequences of drought in competitive forests"*, American Geophysical Union Fall Meeting 2015, San Francisco, CA.

J. Clark, **B. Seyednasrollah**, B. Tomasek, *"Forecasting the forest and the trees: climate impacts from individuals to communities to traits."* , Coweeta LTER Summer Symposium and Meeting Agenda, June, 2015, Coweeta, NC.

B. Seyednasrollah, *"Sensitivity of green-up phenology across different ecosystems using hierarchical modeling"*, Richardson Lab, Harvard University, Cambridge, MA, October 2015.

B. Seyednasrollah, *"Dynamics of forest green-up across different ecosystems"*, Joint Ecology / Marine Lab (JEM) Symposium, Duke University, Beaufort, NC, November 2015.

B. Seyednasrollah, J. S. Clark, J.C. Domec, *"Drought-induced stomatal closure rising canopy temperature observed from space"*, Ecological Society of America Annual Meeting 2015, Baltimore, MD.

J. S. Clark, B. Beckage, A. Berdanier, M. Dietze, C. M. Gough, B. Hardiman, M. Kwit, J. Mohan, S. M. Pearson, W. J. Platt, A. Schwantes, **B. Seyednasrollah**, B. J. Tomasek, C. W. Woodall, P. H. Wyckoff, K. Zhu, *"Forecasting the forest and the trees: Consequences of competition and climate for biodiversity change"*, Ecological Society of America Annual Meeting 2015, Baltimore, MD.

J HilleRisLambers, I. K. Breckheimer, **B. Seyednasrollah**, J. S. Clark, J. F. Franklin, A. J. Larson, J. A. Freund, *"Competitive interactions between tree species will slow compositional turnover with climate change"*, Ecological Society of America Annual Meeting 2015, Baltimore, MD.

B. Seyednasrollah (invited), Andrew Latimer, Leah Johnson, Janneke Hille Ris Lambers, *Applications of Joint Species Distribution Modeling with Case Studies*, The Statistical and Applied Mathematical Sciences Institute (SAMSI), ECOL: Transition Workshop: May 4-6, 2015.

B. Seyednasrollah, *How fast forests green up in different habitats?"*, Duke University Ecology Symposium, Duke Marine Laboratory, Beaufort, NC, April 2015.

B. Seyednasrollah (invited), Andrew Latimer, Ian Breckheimer, Janneke Hille Ris Lambers, *Applications of Joint Species Distribution Modeling with Case Studies*, The Statistical and Applied Mathematical Sciences Institute (SAMSI), ECOL: Multivariate Models in Ecology: March 2-4, 2015.

B. Seyednasrollah *"From Snow Hydrology to Forest Ecology"*, Nicholas School Graduate Students Seminar, Duke University, October, 2014.

M. Kumar, X. Chen, **B. Seyednasrollah**, A. Winstral, M. Reba, D. Marks, *"Assessment of Hydrologic Impacts of Snowdrift in a Snow Dominated Watershed"*, American Geophysical Union Fall Meeting, 2014, San Francisco, CA.

M. Kumar, **B. Seyednasrollah**, T. E. Link, *In search of radiation minima for balancing the needs of forest and water management in snow dominated watersheds*, American Geophysical Union Fall Meeting 2013, San Francisco, CA.

B. Seyednasrollah, M. Kumar, *Using Forest Radiation Model (FoRM) to Quantify the Role of Canopy Coverage on Net Snow Cover Radiation*, American Geophysical Union Fall Meeting 2013, San Francisco, CA.

B. Seyednasrollah, M. Kumar, *Understanding the Role of Canopy Coverage and Tree Morphometry on Net Snow Cover Radiation Using Forest Radiation Model (FoRM)"*, CUAHSI Hydroinformatic 2013, Logan, UT.

T. E. Link, M. Kumar, J. Pomeroy, **B. Seyednasrollah**, C. Ellis, R. Lawler, and R. Essery, *Opportunities and challenges to conserve water on the landscape in snow-dominated forests: The quest for the radiative minima and more...*, American Geophysical Union Fall Meeting 2012, San Francisco, CA.

B. Seyednasrollah, M. Kumar, T. E. Link, *Looking for Radiation Optimality on Snow Covered Forest Floor*, American Geophysical Union Fall Meeting 2012, San Francisco, CA.

B. Seyednasrollah, M.Khosravy-el-Hossani, *Exergy Analysis of excess air variation in boilers*, International Conference on Advances in Mechanical Engineering (ICAME), 2010, Malaysia.

B. Seyednasrollah, M.Khosravy-el-Hossani, *Investigation of Excess Air Variations Effects on Dry Flue Gas Loss*, International Conference on Advances in Mechanical Engineering (ICAME), 2010, Malaysia.

F. Yousefi, **B. Seyednasrollah**, F. Talebi, *Global Analysis for Two Effective Method to Reduction of Control Time in Steady State of Thermal Systems*, The Annual Conference (International) on Mechanical Engineering (ISME), 2008, Kerman, Iran.

B. Seyednasrollah, S.E. Hossein. , F. Talebi, *An Effective Method to Reduction of Control Time in Steady State of Thermal Systems*, The Annual Conference (International) on Mechanical Engineering (ISME), 2007, Tehran, Iran

F. Talebi., **B. Seyednasrollah**, *An Effective Method to Reduction of Control Time in Steady State Convectional Heat Transfer*, The Annual International Conference of Mechanical Engineering (ISME), 2005, Isfahan, Iran.

OTHER PUBLICATIONS

B. Seyednasrollah, and M. Kumar (2014). *"Variability of net radiation on snow-covered forest floor for a range of vegetation densities along a latitudinal transect"*, Internal Technical Document.

B. Seyednasrollah (2005). *Births Flight*, Mechanical Engineering Magazine of ISME, ISSN: 1605-9719, Vol.15 No.51, March 2007.

B. Seyednasrollah (2005). *Description and Estimation of Crude Oil Properties using Oil Manager*, Mechanical Engineering Magazine of ISME, ISSN: 1605-9719, Vol.14 No.40, May 2005.

B. Seyednasrollah (2005). *Thermal Design, Consideration and Simulation of Shell and Tube Heat Exchanger using TASC*, Mechanical Engineering Magazine of ISME, ISSN: 1605-9719, Vol.13 No.39, Mar. 2005.

N. Shokri, B. Firoozabadi., **B. Seyednasrollah** (2005). *Comparison of Streamline and FDM Methods in Reservoir Simulation*, Mechanical Engineering Magazine of ISME, ISSN:1605-9719, Vol.14 No.41. [in Persian].

B. Seyednasrollah (2005). *Nanotechnology from Dream to Fact*, Mechanical Engineering Magazine of ISME, ISSN: 1605-9719, Vol.13 No.38, Jan. 2005.

B. Seyednasrollah (2004). *Design of Pressure Vessel using PVElite*, Mechanical Engineering Magazine of ISME, ISSN: 1605-9719, Vol.13 No.37, Nov. 2004.

Environmental Data Scientist, *Harvard University / NAU*   *2017-present*
  - Developed drawROI application to interactively delineate region of interests (ROIs) for the PhenoCam network
  - Developed an image processing technique to detect and monitor field of view shifts for the PhenoCam network
  - Released calcSolar R package for estimating solar radiation parameters
  - Released hazer R package to estimate haze degree and cloudy conditions from RGB images

Doctoral Research Assistant, *The Clark Lab at Duke University*   *2014-2017*
  - Analyzed 850 GB of remotely-sensed data using a Bayesian state-space framework to study green-up phenology
  - Modeled species distribution across the eastern U.S to understand climate change impacts
  - Quantified canopy water use from surface temperature to monitor drought-induced stress at continental scales
  - Identified regions vulnerable to drought from community-weighted foliar traits

Doctoral Research Assistant, *Hydrology Lab at Duke University*   *2011-2014*
  - Developed the Forest Radiation Model (FoRM) to estimate energy fluxes in snow-covered watersheds
  - Developed the Gap Radiation Model (GaRM) to quantify the radiative energy in forest gaps
  - Quantified hydrological parameters using geospatial modeling and GIS techniques to manage water demands

Senior Research and Development Engineer, *Research Institute of Petroleum Industry*   *2006-2011*
  - Managed a team of developers to develop the computational core for an energy assessment software (EPAT)
  - Led the computational module team for the 3D Pars Basin Modeler
  - Modeled petroleum generation and transport in sedimentary basins
  - Implemented oil reservoir similation in 3D

Research Assistant, *Parallel Computing Lab at Sharif University of Technology*   *2004-2006*
  - Developed a core model for "Parallel Simulation of Multiphase flow in Porous Media" in C/C++ to improve
    modeling techniques in oil reservoir simulations

Director of Scientific Magazine, *Iranian Society of Mechanical Engineer (ISME)*   *2004-2007*
  - Managed a group of editors and staff to publish over 24 issues of the ISME technical magazine.
  - Edited and reviewed scientific articles to be published in a bi-monthly mechanical engineering magazine.
  - Prepared instructional materials for the "Population and Environment Course" taught in universities.
  - Cooperated with the FCOO (Fuel Consumption Optimization Organization) to publish an assessment report

Design Engineer, *Consulting Engineers Companies*   *2003-2004, 2009*
  - Consulted in preparing design documents for cooling systems in thermal power stations
  - Prepared, reviewed and designed engineering and construction documents for petrochemical plants.
  - Designed industrial heat exchanger systems

TEACHING EXPERIENCE

Teaching, *Duke University*   *2016*
  - Modeling Ecohydrology using Mathematica and MATLAB as a side-course (4-5 PhD students, teaching,
    holding office hours)

Teaching Assistant, *Duke University*   *2011-2016*
  - Introduction to Environmental Science and Policy (90+ undergraduate students, co-teaching, grading, leading
    discussion groups, holding office hours)
  - Eco-hydrology (about 20 undergraduate/graduate students, holding office hours)
  - California Water Crises (about 15 master's/professional students, organizing the course material, holding
    office hours)
  - Watershed Hydrology (about 15 master's/professional students, holding office hours, grading, leading problem
    solving sessions)

- Hydrology Modeling (4-8 graduate students, co-teaching, grading, holding office hours)
- GIS for Water Quantity and Quality Assessment (12-25 graduate students, problem solving sessions, grading, holding office hours, assisting lab assistant)

Instructor, *Research Institute of Petroleum Industry* *2010*
- VBA Programming for Engineering Purposes (about 20 senior engineers, design the course, teaching, lab troublshooting)

Teaching Assistant/ Tutor, *University of Semnan* *2002-2003*
- Heat Transfer (20+ undergraduate students, leading problem solving session)
- Fluid Mechanics (20+ undergraduate students, leading problem solving session)
- Dynamics and Statics (undergraduate students, private tutoring)
- Thermodynamics (undergraduate students, private tutoring)

Honors, Awards and Achievements

Outstanding Accomplishments Fellowship, The Graduate School & Nicholas School, Duke University *2016*

The Competitive Summer Research Fellowship , The Graduate School, Duke University *2016*

The Bass Instructional Fellow, Duke University *2015 and 2016*

Summer Research Award, Nicholas School of the Environment *2014 and 2015*

Pathfinder Fellow, The Consortium for the Advancement of Hydrologic Science Inc. (CUAHSI) *2014 - 2015*

NASA Travel Award, NASA Snow School for Practitioners and Modelers, Fraser, CO *2014*

CUAHSI Travel Award, CUAHSI Conference on Hydroinformatics and Modeling, Logan, UT *2013*

NSF Travel Award, EarthCube Modeling Workshop for the Geosciences, Boulder, CO *2013*

National Elite, The National Association of Elites (Iran) *2008*

1st Departmental Rank, Mechanical Engineering Department, University of Semnan *2003*

34th National Rank, Nationwide Entrance Exam for Graduate Study in Mechanical Engineering *2003*

56th National Rank, Nationwide Entrance Exam for Graduate Study in Aerospace Engineering *2003*

Exceptional Talent, National Organization for Developing Exceptional Talents (NODET) *1999*

Services, Outreach and Memberships

Editorial:

Reviewer, *Agricultural and Forest Meteorology*	*2017 - present*
Reviewer, *Journal of Ecosphere, Ecological Society of America*	*2016 - present*
Reviewer, *Journal of Soild Earth, European Geosciences Union*	*2016 - present*
Reviewer, *Journal of Geophysical Research: Atmospheres, American Geophysical Union*	*2015 - present*
Reviewer, *Asia-Pacific Journal of Chemical Engineering*	*2016 - present*
Editor, *Duke Science Review*	*2016*
Session Chair, *International Conference on Advances in Mechanical Engineering (ICAME2010)*	*2010*
Editorial Board, *Mechanical Engineering Magazine, Iranian Society of Mechanical Engineers*	*2004-2007*

Outreach:

Statistician, *United Nations Human Settlements Programme, UN-Habitat*	*2016 - present*
VIP Consultant in Modeling, *The American Statistical Association (ASA), DataFest Competition*	*2016*
Competition Judge, *Student Academy of Science, Regional Science and Engineering Fair*	*2016*

Working Groups:

Program on Quasi-Monte Carlo and High-Dimensional Sampling Methods for Applied Mathematics (QMC), *Statistical and Applied Mathematical Sciences Institute (SAMSI)*   *2017*

Ecology: Multivariate Models, Climate and Biodiversity, *Statistical and Applied Mathematical Sciences Institute (SAMSI)*   *2014 - 2015*

Services:

Nicholas School Diversity & Inclusion Committee, *Duke University*   *2013 - 2015*
Graduate & Professional Student Council's Groups, *Duke University*   *2012 - 2013*
The Software Council, *Research Institute of Petroleum Industry (RIPI)*   *2010 - 2011*
Undergraduate Scientific Committee, *University of Semnan*   *2000 - 2001*

Memberships:

Ecological Society of America (ESA)
American Geophysical Union (AGU)
Iranian Society of Mechanical Engineers (ISME)

SKILLS

Programming and Scripting:

C/C++/C#, R, R-Shiny, MATLAB, Mathematica, VBA, Fortran, Pascal, Python, Batch Script, Object Oriented Programming (OOP), High Performance Computing (HPC), Multithreaded Programming, OpenMP and MPI, Socket programming, HTML/CSS, LaTeX, make, programming in Unix and Windows based platforms.

Quantitative, Geospatial and Visualizations:

GIS, Remote Sensing, Data Elevation Model (DEM) Processing, Optimization, Numerical Methods, Hierarchical Modeling, Bayesian Statistics, Markov chain Monte Carlo (MCMC), Finite Difference Methods, Finite Element Methods, Finite Volume Methods.