

Hossein Noorazar

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SUMMARY

A resourceful mathematician, researcher, and programmer with an interest in applying mathematical techniques to a variety of applications. I am interested in several (and closely related) fields; image processing, remote sensing, machine learning, data science, and scientific computing. Most recently I have been working on developing models for a variety of agricultural applications for decision support.

EDUCATION

Ph.D. Applied Mathematics 2017

Washington State University, Pullman, WA

Thesis title: An energy-based interaction model for population opinion dynamics with topic coupling

Advisors: Kevin R. Vixie and Matthew J. Sottile

M.S. Mathematics 2014

Washington State University, Pullman, WA

Project: An induced dimension reduction algorithm to approximate eigenpairs of matrices

Advisor: David S. Watkins

COMPUTER SKILLS

Languages: My background gives me strong computing skills and designing algorithms, with a strong emphasis on programming. I have extensive experience with Python, MATLAB, R, R-Shiny, Scala, Mathematica, JavaScript, \LaTeX

Applications: Google Earth Engine, SQL

Operating Systems: Mac OS, Linux in High Performance Computing Environments

PROFESSIONAL EXPERIENCE

Co-Founder and Research Scientist; iSciLabs

2022 - Present

Postdoctoral Researcher

2017 - Present

In my postdoctoral position I have completed the projects listed below. The models developed for these projects are deployed on Linux-based high-performance computing structures. The web interface of the decision-tool systems, developed by R-Shiny, are deployed on Washington State University server.

- Developed an App for WSDA to Detect Double-Cropped Fields (end-to-end)
- Estimate the Double-Dropped Fields in Washington State (Washington State Department of Ecology Grant # WROCR1921WASTUN00010)
- Study Trend of the Double-Dropping Trend in Washington State over past 30 years (NASA Grant #1667355)
- Codling moth pest pressures in Washington State apples: management implications under a changing climate (USDA Northwest Climate Hub grant #17JV11261944071)
- Insufficient chill accumulation for tree fruit: diverse risk profiles in the Pacific Northwest US (USDA NIFA Western ERME grant #2018-70027-28587)
- Utility of analogs as an approach to identify pest management solutions under climate change (USDA NIFA Western ERME grant #2018-70027-28587)
- Lagoon overflow risk as a consequence of climatic changes: a management perspective
- Help supervising graduate students of the team.

Ongoing projects:

- Developing and prototyping machine learning pipelines for crop type classification, land cover classification, soil quality assessment using satellite imagery. The satellite data for this project is processed using the Google Earth Engine and Microsoft Azure infrastructures. The machine learning pipeline is deployed on both Microsoft Azure cloud and Linux-based cloud of Washington State University.
- Designing, implementing and maintaining the programs, end-to-end, for my projects using R.
- Creating and maintaining the CAHNRS' ag.-climate-tools website using R-shiny.

Washington State University, Pullman, WA
 Supervisor: Kirti Rajagapolan

Freelance

2015 (1 month)

Quick prototyping for automatic detection of rust spots in the images (an image processing application). This was done to automate the process of detecting rusts in oil-extraction equipment in order for humans to take action and fix the problem.

Kaggle project: TalkingData AdTracking Fraud Detection Challenge (Applied random forest and gradient boosting techniques)

Cleaning of patients data from national database of the US for Oregon Health & Science University Hospital projects.

Teaching Experience (as a TA)
 Washington State University

2011-2017

- [1] Sole instructor for freshmen and sophomore non-math-major students; linear algebra, calculus, exploring mathematics (class sizes from 30 to 120 students.)
 math.wsu.edu/students/hnoorazar/personal
 - Linear Algebra, Sole Instructor, 5 Semesters
 - Calculus, Sole Instructor, 3 Semesters
 - Exploring Mathematics, Sole Instructor, 3 Semesters
- [2] Lab instructor, grading and/or holding lab sessions for courses such as (but not limited to) applied mathematics, discrete mathematics, introduction to mathematical reasoning, calculus I, II, III, 6 Semesters

GRANTS

Role	Agency	Amount	Duration	Title
Co-PI (PI Chaudhary)	Microsoft	\$15,000	11/2020 - 11/2021	Automated Crop Classification using Satellite Imagery. Computing grant: 00010000181

CODE PROJECTS

My code projects can be found on <https://github.com/hnoorazar/>

CONFERENCE ORGANIZATION

- Committee member of second annual Data Science Days
 Washington State University 2017
- Organizing committee member of AMS Sectional Meeting
 Washington State University 2017
- Committee member of first annual Data Science Days
 Fund raising, running website, logistics
 Washington State University 2016

Committee member of Distinguished Speaker Series in Data Science 2015 and 2016
Running and maintaining website and logistics (<https://math.wsu.edu/datascience/>)

PUBLICATIONS

- [9] **Hossein Noorazar**, Kirti Rajagopalan, Michael Brady, Supriya Savalkar, Mingliang Liu
Double-Cropping trend in Pacific Northwest as a consequence of global warming
(In Progress)
- [8] **Hossein Noorazar**, Vincent P. Jones, Georgine G. Yorgey, Sonia A. Hall, Chad E. Kruger, Kirti Rajagopalan
Codling moth pest pressures and pest control efficacy under climate change (Submitted – pre-print on [ResearchSquare](#))
- [7] Michael M Forbes, **Hossein Noorazar**, Gary Sandine, and Kevin R. Vixie
Cycles Discovery: Metrics, Sparsity, and Needles in a Haystack
Cycles Magazine, Vol 50, No.4, 2021
<https://journal.cycles.org/Issues/Vol50-No4-2021/>
- [6] **Hossein Noorazar**, Lee Kalcsits, Vincent Jones, Matthew Jones, Kirti Rajagopalan
Climate change and chill accumulation: implications for tree fruit production in cold-winter regions
[Climatic Change](#) – pre-print on [bioRxiv](#).
- [5] **Hossein Noorazar**, Anurag K. Srivastava, Sajjan K. Sadanandan, Sanjeev Pannala
Data-driven Operation of the Resilient Electric Grid: A Case of COVID-19
[The Journal of Engineering](#) – pre-print on [arXiv](#)
- [4] **Hossein Noorazar**
Recent advances in opinion propagation dynamics: a 2020 survey
[The European Physical Journal Plus](#) – pre-print on [arXiv](#)
- [3] **Hossein Noorazar**, Kevin Vixie, Arghavan Talebanpour and Yufeng Hu.
From classical to modern opinion dynamics
[International Journal of Modern Physics C](#) – pre-print on [arXiv](#)
- [2] **Hossein Noorazar**, Matthew J. Sottile, and Kevin R. Vixie.
Loss of community identity in opinion dynamics models as a function of inter-community interaction strength
pre-print on [arXiv](#)
- [1] **Hossein Noorazar**, Matthew J. Sottile and Kevin R. Vixie.
An energy-based interaction model for population opinion dynamics with topic coupling
[International Journal of Modern Physics C](#) – pre-print on [arXiv](#)

INTERESTS

Without any order: Image Processing, Numerical Linear Algebra, Mathematics and Data, Machine Learning

PROFESSIONAL ASSOCIATIONS

American Mathematical Society (AMS)
Society for Industrial and Applied Mathematics (SIAM)

LANGUAGES

English, Persian, Azerbaijani

REFERENCES

Prof. Kevin R. Vixie
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Asst. Prof. Kirti Rajagopalan
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