Harish Baki

Postdoctoral Associate
University at Albany
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Google Scholar || LinkedIn || GitHub

EDUCATION

Indian Institute of Technology Madras — Chennai, Tamil Nadu, India
Integrated MS & Ph.D., Mechanical Engineering — 2017-2022

- Dissertation: "Sensitivity based Calibration Strategy with Data Assimilation to Improve the Prediction of Cyclones over the Indian Subcontinent"

Rajiv Gandhi University of Technology – NUZVID — Nuzivid, Andhra Pradesh, India
Bachelor of Technology (Honors), Mechanical Engineering — 2011-2015

PROFESSIONAL EXPERIENCE

University at Albany — Albany, New York, the US
Postdoctoral Associate — September 2024 - present
Atmospheric Sciences Research Center

Technical University of Delft — Delft, The Netherlands
Postdoctoral Researcher — September 2022 -August 2024
Department of Geosciences and Remote Sensing
Faculty of Civil Engineering and Geosciences

Indian Institute of Technology Madras — Chennai, Tamil Nadu, India
Institute Postdoctoral Equivalent Fellowship — January 2022 – June 2022

RESEARCH INTERESTS

Numerical weather prediction; atmospheric boundary layer processes; machine learning; renewable energy; wind resource modeling; solar resource modeling, and tropical cyclones;

SELECTED ACCOMPLISHMENTS

- Fourth place of the NeurIPS-2024 competition: https://weather4cast.net/ — 2023

MACHINE LEARNING ACTIVITIES

Participation in Competitions

- NeurIPS-2024 Weather4Cast: Super-Resolution Rain Movie Prediction under Spatiotemporal Shifts — 2023
  Ranked 4th, https://weather4cast.net/

Online Courses

- Coursera: Introduction to Machine learning 2017

REVIEWING ACTIVITIES

Papers reviewed for: Environmental Research Letter; Journal of Hydrology.

JOURNAL PUBLICATIONS

Google Scholar Citations: https://scholar.google.com/citations?user=2q-QsUIAAAAJ&hl=en&authuser=1
ResearchGate Page: https://www.researchgate.net/profile/Harish-Baki
ORCID: 0000-0003-1956-8280
SCOPUS: 57226340925

[11] **Baki, H.,** Basu, S., & Lavidas, G. (2024). Modelling Frontal Low-Level Jets and Associated Extreme Wind Power Ramps over the North Sea. *Wind Energy Science Discussions*, *2024*, 1-39.

[10] **Baki, H.,** Basu, S., & Lavidas, G., Estimating the Offshore Wind Power Potential of Portugal by Utilizing Gray-Zone Atmospheric Modeling. Available at SSRN: https://ssrn.com/abstract=4795209 or http://dx.doi.org/10.2139/ssrn.4795209

[9] Reddy, P. J., Chinta, S., **Baki, H.,** Matear, R., & Taylor, J. (2024). Gaussian process regression-based Bayesian Optimisation (G-BO) of model parameters—a WRF model case study of southeast Australia heat extremes. *Geophysical Research Letters*, *51*(17), e2024GL111074.

[8] **Baki, H.,** & Basu, S. (2024). Estimating high-resolution profiles of wind speeds from a global reanalysis dataset using TabNet. *Environmental Data Science,* (Accepted).

[7] Reddy, P. J., **Baki, H.,** Chinta, S., Matear, R., & Taylor, J. (2023). PAUNet: Precipitation Attention-based U-Net for rain prediction from satellite radiance data. *arXiv preprint arXiv:2311.18306*

[6] Reddy, P. J., Chinta, S., Matear, R., Taylor, J., **Baki, H.,** Thatcher, M., ... & Sharples, J. (2023). Machine learning based parameter sensitivity of regional climate models—a case study of the WRF model for heat extremes over Southeast Australia. *Environmental research letters*, *19*(1), 014010

[5] **Baki, H.,** Chinta, S., Balaji, C., and Srinivasan,B. (2021). Determining the sensitive parameters of the Weather Research and Forecasting (WRF) model for the simulation of tropical cyclones in the Bay of Bengal using global sensitivity analysis and machine learning, *Geoscientific Model Development,* **15(5), pp.2133-2155.**

[4] **Baki, H.,** Chinta, S., Balaji,C., and Srinivasan,B. (2021). WRF model parameter calibration to improve the prediction of tropical cyclones over the Bay of Bengal using Machine Learning-based Multiobjective Optimization, *Journal of Applied Meteorology and Climatology, **61(7), pp.819-83***. https://doi.org/10.1175/JAMC-D-21-0184.1

[3] **Baki, H.,** Balaji, C., and Srinivasan, B. (2021). Impact of data assimilation on a calibrated WRF model for the prediction of tropical cyclones over the Bay of Bengal, *Current Science*, **122(5), pp.569-583**. https://doi.org/10.18520/cs/v122/i5/569-583

[2] **Baki, H.,** Chinta, S., Balaji, C., and Srinivasan, B. (2021). A sensitivity study of WRF model microphysics and cumulus parameterization schemes for the simulations of tropical cyclones using GPM radar data, *Journal of Earth System Science* **130(4), pp.1-30**. https://doi.org/10.1007/s12040-021-01682-3

[1] **Baki, H.,** Kumar, K. E. S., & Srinivasan, B. (2020). Topology Optimization Using Convolutional Neural Network. In *Advances in Multidisciplinary Analysis and Optimization* **(pp.301-307)**. Springer, Singapore.https://doi.org/10.1007/978-981-15-5432-2_26

BOOKS

[1] Chinta, S., **Baki, H.,** Balaji, C., and Srinivasan, B. (2024). Fine-Tuning Extreme Rainfall Predictions: A Machine Learning Approach - Sandeep Chinta, Harish Baki, C. Balaji & Balaji Srinivasan, *Ane Books Pvt. Ltd.* ISBN: 9788119662289

CONFERENCE PRESENTATIONS

[5] **Baki, H.,** & Basu, S., (2024, April). Estimating high-resolution profiles of wind speeds from a global reanalysis dataset using TabNet. Climate Informatics 2024.

[4] **Baki, H.,** Basu, S., & Lavidas, G., (2023, May). Statistical characterization of simulated wind ramps. In *EGU General Assembly Conference Abstracts* (pp. EGU-17208).

[3] **Baki, H.,** Chinta, S., Balaji, C., and Srinivasan, B. (2021). Use of Machine Learning algorithms in evaluating the WRF model parameter sensitivity for the simulations of tropical cyclones, *vEGU21, the 23rd EGU General Assembly*, held online 19-30 April 2021, id. EGU21-5826.

[2] **Baki, H.,** Chinta, S., Balaji, C., and Srinivasan, B. (2021). A Preliminary Study of GPM Radar Reflectivity Assimilation using WRF model for Tropical Cyclones, *4th National Conference on India Radar Meteorology*, 5-7 Febryary 2020, IIT Madras, India.

[1] **Baki,H.,** Kumar,K.E.S., & Srinivasan,B. (2020). Topology Optimization Using Convolutional Neural Network. In *Advances in Multidisciplinary Analysis and Optimization* **(pp.301-307)**. Springer, Singapore.https://doi.org/10.1007/978-981-15-5432-2_26

TEACHING

Delft University of Technology

- CIEM4210: Marine Renewables (Module B1, Q4, 2024)
  Lecture 11 on Wind resource assessment