Mr.Kiran D. Salunke

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Education

•Department of Technology,Savitribai Phule Pune University,Maharashtra *2020-Present*
Int MTech PhD (Computer and Information Technology.) CGPA: 7.13/10
*Ph.D Topic: Deep Learning based framework for ENSO and ISMR Prediction

•Centre for Modeling and Simulation, Savitribai Phule Pune University,Maharashtra *2015-2017*
MTech (Modeling and Simulations) CGPA: 2.24/6

•Department of Computer Science, North Maharashtra University, Jalgaon, Maharashtra *2007-2009*
MSc (Computer Science) Percentage: 52.08

•Jaihind College Dhule *2000*
Maharashtra State Board, Maharashtra, Percentage: 55.83

•Pandit Nehru School *1998*
Maharashtra State Board, Maharashtra, Percentage: 74.40

Experience

•Indian Institute of Tropical Meteorology *2009-Till date*
Junior Scientific Officer Pune

- **Monsoon Mission Project**: Seasonal prediction and experiments using fully coupled General Circulation Climate Model: Development of a dynamical system for Indian summer monsoon rainfall prediction.
- **Potential predictability of ISMR using CFS v2 Model simulations**. (Journal of advanced in Modeling Earth System ,2017, M.Tech.(Modeling Simulation Thesis) The potential predictability of the Indian summer monsoon rainfall (ISMR), soil moisture, and sea surface temperature (SST) is explored in the latest version of the NCEP Climate Forecast System (CFSv2)retrospective forecast at five different lead times. The focus of this study is to find out the sensitivity of the potential predictability of the ISMR to the initial condition through analysis of variance technique (ANOVA),information-based measure, including relative entropy (RE), mutual information (MI), and classical perfect model correlation.
- **Deep learning for El-Niño Southern Oscillation prediction**: The development of machine learning methods for Indian summer monsoon rainfall prediction using Deep learning techniques such as convolution neural network. Indian summer monsoon is complex phenomenon which is only partially understood and cannot be modeled by simple linear models as they are not satisfactory in engrossing the high non linearity and disturbances present in the phenomenon. Convolution neural networks are one of the most important and efficient tools for the development of forecast models for Indian summer monsoon
- **Deep learning for Indian summer monsoon rainfall prediction** Machine learning is recently being used for the prediction of rainfall. Transfer learning is a machine learning method where a model developed for a task is reused as the starting point for a model on a second task. It is a popular approach in deep learning where pre-trained models are used as the starting point on computer vision and natural language processing tasks given the vast compute and time resources required to develop neural network models on these problems and from the huge jumps in skill that they provide on related problems

Technical Skills and Interests

Languages:Fortran 90, Python,C, Matlab,R
Developer Tools Keras,Tensorflow,Pytorch,Xconv,NCO,CDO
Areas of Interest:Artficial Intelligence,Machine Learning, Climate modeling (CFS,PWP,MOM4,MOM5),HPC,data assimilation

Achievements

- Indian Meteorological Society Young Scientist Award for the best paper in Topical Meteorology *Sep 2014*
- Twenty Fifth Annual Silver Jubilee award of IITM *Nov 2013*
- Excellent Performance award in Group B Officer *Nov 2013*
- Certificate of Excellence Award in Scientific Officer Category *Nov 2022*

Workshop/Training/Summer School

1. National Training on Artificial Intelligence /ML and Data Assimilation from 5-10 February 2023 at IITM Pune By Dr. Laxmivarahan Professor, University of Oklahoma, USA.
2. TAI4ES 2022 Summer School Trustworthy Artificial Intelligence for Environmental Science 27-30 Jun 2022.
3. WCRP virtual summer school on 'Attribution, causality, and decision-making' in climate variability and change 6-10 Jun 2022.
4. Summer School on Big Data Analytics for Ocean, Atmosphere and Climate Research on 4-22 July 2022.
5. AI/ML workshop by Virtual Center of the Ministry of Earth Sciences on 9th to 10th of May 2022.
6. Kavli Program in Machine Learning and the Physics of Climate Nov 1 - Dec 17, 2021
7. 3rd NOAA Workshop on Leveraging AI in Environmental Sciences 13-17 Sep 2021.
8. TAI4ES 2022 Summer School Trustworthy Artificial Intelligence for Environmental Science 26-29 Jul 2021.
9. Google Research india Graduate Symposium, held from April 7-10,2021.
10. Training in AI/ML for atmosphere-ocean applications during 15-19 Feb 2021
11. RIKEN Advanced institute of computational Science, Japan International school on Data assimilation during 22-26 Jan 2018 and delivered lecture on Big Data assimilation.
12. International Faculty development program International conference on Advances in computing and communication (ICACC 2017) at Rajagiri School of Engineering and Technology (RSET) Kochi Kerala During 16-23 August 2017.
13. ESCAPE Young Scientist Summer School (YSSS) on Energy-efficient Scalable Algorithms for Weather Prediction at Exascales, at Copenhagen, Denmark, during 7-12 August 2017.
14. HPC Advanced Training at High Performance Computing Centre , IITM, Pune on 22-24 Jul 2015
15. ICTP, Trieste, Italy "Developer School for HPC applications in Earth Sciences and Symposium on HPC and Data-Intensive Applications in Earth Sciences" during 27th October - 14th November 2014.
16. APCC Busan, South Korea during 19-30 Nov 2012 to participate in the APCC Training Program on Climate Variability Seasonal Prediction.

Research Publications

1. Hari K.B.R.R., Sreenivas P., Rao Suryachandra A., George G., **Salunke K.**, Krishna P.M., Dandi A.R., Rao D.N.Impact of horizontal resolution on sea surface temperature bias and air–sea interactions over the tropical Indian Ocean in CFSv2 coupled model , International Journal of Climatology, 40, September 2020, DOI:10.1002/joc.6496, 4903-4921
2. Pillai P.A., Rao S.A., Das R.S., **Salunke K.**, Dhakate A., Potential predictability and actual skill of Boreal Summer Tropical SST and Indian summer monsoon rainfall in CFSv2-T382: Role of initial SST and teleconnections,Climate Dynamics, 51, July 2018, DOI:10.1007/s00382-017-3936-y, 493-510
3. Pillai P.A., Rao S.A., George G., Rao D.N., Mahapatra S., Rajeevan M., Dhakate A.,**Salunke K.** How distinct are the two flavors of El Niño in retrospective forecasts of Climate Forecast System version 2 (CFSv2)? Climate Dynamics, online, June 2017 ,DOI:10.1007/s00382, 1-26-016-3305-2, 1-26
4. Chattopadhyay R., Suryachandra A. Rao, Sabeerali C.T., George G., Rao Nagarjuna D., Dhakate A., Salunke K., Large-scale teleconnection patterns of Indian summer monsoon as revealed by CFSv2 retrospective seasonal forecast runs, International Journal of Climatology, 36, July 2016, DOI:10.1002/joc.4556, 3297–3313
5. Pokhrel S., Saha Subodh K., Dhakate A., Rahman H., Chaudhari H.S.,**Salunke K.**, Hazra A., Sujith K., Sikka D.R., Seasonal prediction of Indian summer monsoon rainfall in NCEP CFSv2: forecast and predictability error, Climate Dynamics, 46, April 2016, DOI:10.1007/s00382-015-2703-1, 2305-2326

6. Ramu D. A., Sabeerali C. T., Chattopadhyay R., Rao D. N., George G., Dhakate A. R.,**Salunke K.**, Srivastava A., Suryachandra A. Rao Indian summer monsoon rainfall simulation and prediction skill in the CFSv2 coupled model: Impact of atmospheric horizontal resolution, Journal of Geophysical Research, 121, March 2016,DOI:10.1002/2015JD024629, 1-17

7. Saha, S., S. Pokhrel, **Kiran Salunke**, A. Dhakate, H. S. Chaudhari, H. Rahaman,K.Sujith, A. Hazra, D. R. Sikka (2016), Potential Predictability of Indian Summer Monsoon Rainfall in NCEP CFSv2, Journal of Advances in Modeling Earth Systems,8, February 2016, DOI:10.1002/2015MS000542, 1-25

8. Chattopadhyay R., Phani R., Sabeerali C.T., Dhakate A.R., **Salunke K.D.**, Mahapatra S.,Suryachandra A. Rao, Goswami B.N Influence of extratropical sea-surface temperature on the Indian summer monsoon: an unexplored source of seasonal predictability Quarterly Journal of Royal Meteorological Society, 141, October 2015, DOI:10.1002/qj.2562, 2760-2775

9. Sabeerali C.T., Suryachandra A. Rao, Dhakate A.R., **Salunke K.**, Goswami B.N., Why ensemble mean projection of south asian monsoon rainfall by CMIP5 models is not reliable? Climate Dynamics, 45, July 2015, DOI:10.1007/s00382-014-2269-3, 161-174

10. Saha Subodh K., Pokhrel S., Chaudhari H.S., Dhakate A., Shewale S., Sabeerali C.T.,**Salunke K.**, Hazra A., Mahapatra S., Suryachandra A. Rao, Improved simulation of Indian summer monsoon in latest NCEP climate forecast system free run, International Journal of Climatology, 34, April 2014, DOI:10.1002/joc.3791,1628–1641

11. Chaudhari H. S., S. Pokhrel, S. Saha, A. Dhakate, R. Yadav, **Kiran Salunke**, S. Mahapatra,C.T. Sabeerali, and S. A. Rao, 2012. Model biases in long coupled runs of NCEP CFS in the context of Indian Summer Monsoon, International Journal of Climatology. April 2013 DOI-10.1002/joc.3489.

12. Anupam Hazra S. Taraphdar , Madhuparna Halder, P. Mukhopadhyay, H. S. Chaudhari, S. Pokhrel, **Kiran Salunke**, S. A. Rao, and J.–P. Chen Indian summer monsoon drought 2009: cloud microphysics perspectives Atmospheric Science Letter. July 2013, DOI: 10.1002/asl2.437,181-186

13. C. T. Sabeerali, A. Ramu Dandi, Ashish Dhakate, **Kiran Salunke**, S. Mahapatra,Suryachandra A. Rao Simulation of boreal summer intraseasonal oscillations in the latest CMIP5 coupled GCMs Journal of Geophysical Research: Atmospheres published online: 29 may 2013 DOI: 10.1002/jgrd.50403

14. Pokhrel S., H. S. Chaudhari, A. Dhakate, S. Saha, R. Yadav, **Kiran Salunke**, S. Mahapatra,and S. A. Rao. ENSO, IOD and Indian Summer Monsoon in NCEP climate forecast system; Climate Dynamics, Nov 2012, DIO- 10.1007/s00382-012-1349-5.

15. Mujumdar M., **Kiran Salunke,** S.A. Rao, M. Ravichandran and B.N. Goswami, 2011. Diurnal cycle induced amplification of sea surface temperature Intraseasonal oscillations over the Bay of Bengal in summer monsoon season in IEEE Geoscienc and Remote Sensing Letters. March 2011, DOI-10.1109/LGRS.2010.2060183