Venugopal Reddy Thallam

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Career Objective

To work for a sustainable society, ecosystem, social good and well-being of the world using science, technology, and humanities. Interested in Geoscientific model and software development for finding practical, applicable solutions for state estimation of complex dynamical systems.

I enjoy collaborating with peers, academicians, industries, and other stakeholders, which may provide me with a scope to enhance my skills and knowledge in research and apply the same to the progress and understanding of the earth and environmental sciences for societal benefits.

Education

2018-present	PhD (pursuing)	Department of Earth Science, Air, Water and Landscape Science, Uppsala University, Sweden.
2010-2012	Masters in Earth and Space Sciences (University topper with 80.53%)	Sri Venkateshwara University, Tirupati, India.
2005-2009	Bachelor's in computer science and Engineering (First class with 70%)	Jawaharlal Nehru Technological University, Anantapur, India.

Academic achievements and research grants

1. Nominated to "**Schmidt Science Fellows 2023**" by Uppsala University.
2. Received Uppsala University **Student Union Travel Scholarship** for the year 2020.
3. Received **full funding** to attend the training program on developing and applying coupled regional climate models at **UNESCO/IOC Regional Training and Research Center** on Ocean Dynamics and Climate, First Institute of Oceanography (FIO), Qingdao, China, 2020.
4. **Jänes annual scholarship for research in Earth Sciences**, Faculty of Science and Technology, Uppsala University, 2019.
5. **Group Leader, Best Trainee award in the 9th ODC training course** on climate dynamics and air-sea interactions at First Institute of Oceanography (FIO) Qingdao, China, 17-28 June 2019 by UNESCO/IOC Regional Training and Research Center on Ocean Dynamics and Climate.
6. Received **full funding from the United States Army Corps of Engineers and Center for Western Weather and Water Extremes (CW3E)** to attend the AR Colloquium Summer School, Scripps Institution of Oceanography, University of California, San Diego.
7. Receiving **funding** from the Swedish Research Council (VR) and Uppsala University, Sweden, for research on Atmospheric Rivers and extreme hydrometeorological events, 2018-present.
8. Received **research grant** from the **Novosibirsk State University and Russian Academy of Sciences** for research in basic sciences, 2016-2018.

9. Received **International Research** Fellowship from the **Ministry of Culture and Education, Russian Federation**, 2016-2018**.**
10. Received the 2nd prize for best presentation at DST-SERB school on "Fundamentals of Oceanic Processes and Modeling", Centre for Atmospheric Sciences, IIT-Delhi, May 19 - June 11, 2015.
11. Received best presentation award in International Training Course on "Indian Ocean Dynamics: From the Large-scale Circulation to Small-scale Eddies and Fronts" ESSO-INCOIS, 16-27 November 2015.
12. **Fellow** of the Department of Meteorology and Oceanography, Andhra University, India, 2015-2016.
13. **DST-INSPIRE Scholarship Award** for being the University's top in master's degree at Sri Venkateshwara University to pursue research work in fundamental and applied sciences, 2014-2016.
14. **Merit scholarship from Indian Space Research Organization (ISRO)**, Government of India, for academic excellence and to work on master's thesis at the National Remote Sensing Center (NRSC), Hyderabad, 2011-2012.
15. **University topper in Master of Technology** (Space Technology and Application), Department of Physics, Sri Venkateshwara University, Tirupati, India, 2012.
16. **Acquired 4th Rank** in Master of Technology (Space Technology and Applications) entrance exam, 2010.
17. **Alumni Award** for being a bachelor's (Bachelor of Technology) topper, Jawaharlal Nehru Technological University, Anantapur, 2008.
18. **Best Student Award** for the years 1999 and 2000 in high school studies.

Academic and professional employment

Sep 2018-present	Air, Water and Landscape Science program Department of Earth Science, Uppsala University, Sweden.
Sep 2018-present	CNDS, Department of Earth Science, Uppsala University, Sweden.
Sep 2019-present	CEFO, Uppsala University, Sweden.
Sep 2016-Aug 2018	Department of Physics, Novosibirsk State University, Russian Academy of Sciences, Novosibirsk, Russian Federation.
Jan 2016-Sep 2016	Meteorology and Climate Sciences group, Skymet Weather Services, Noida, India.
Jan 2015-Jan 2016	Department of Meteorology and Oceanography, Andhra University, Visakhapatnam, India.
May 2014-Jan 2016	Modelling and Observations Group, ESSO-INCOIS, Ministry of Earth Sciences, Hyderabad, India.
Jul 2012-May 2014	Physical Oceanography Division, National Institute of Oceanography, CSIR, Goa, India.

Jun 2011-Jun 2012	National Remote Sensing Center (NRSC), Indian Space Research Organization (ISRO), Department of Space, Hyderabad, India.

Research experience and projects

1. Experience using **numerical models and statistical and machine learning techniques** for parameterizing and forecasting weather and climate variables.
2. Developed **Python algorithms for effective tracking** of lifetime and lengths/size of Atmospheric rivers on an hourly basis globally.
3. Working on **integrated water vapour transport, dynamics, and thermodynamics of the atmosphere** for understanding extreme **hydrometeorological events**.
4. Experience using **Bayesian techniques and Image-Processing based object tracking** methods implemented on a framework for parallel data analytics on large-scale systems using C++, MPI + X, OpenMP, or GPUs, wrapped in Python to deliver state-of-the-art performance and scaling.
5. Working to quantify the importance of air-sea interaction on **atmospheric rivers** to better predict extreme events on the land.
6. Experience quantifying atmospheric dynamics and thermodynamic parameters' role in **cloud formation and extreme precipitation.**
7. Experience in using **in situ, numerical models, and satellite data** to study the role of upper ocean dynamics, thermodynamics and stratification on cyclones.
8. Developed **techniques to study the life cycle of tropical cyclones** and associated precipitation using lightning data.
9. Studied the impact of **large-scale circulation and coupled ocean-atmospheric processes (ENSO, IOD)** on the variability of upper ocean processes on evaporation, winds, clouds, and water vapour transport in the Indian Ocean region and on the Indian summer monsoon rainfall.
10. Experience using machine learning techniques to improve the vertical resolution of atmospheric relative humidity profiles from **geostationary satellites** and using **GPSRO data**.
11. Developed super ensemble machine learning models to downscale, bias correct and generalise the **North American Multimodal Ensemble (NMME)** global seasonal forecasting for precipitation and temperature on a regional scale.
12. Processing and analyzing ocean-atmospheric parameters data from **satellite altimeters and in situ instruments.**
13. **Participated in onboard cruises** over the Bay of Bengal to collect in-situ oceanography and meteorology data like wind, humidity, subsurface temperature, salinity, and phytoplankton using in situ instruments like **XBT, XCTD, and CTD**.
14. Experience validating, statically analyzing and evaluating high-resolution, hybrid and blended atmospheric and ocean flux data sets (required to force GCMs) from multiple reanalysis and satellite products like **MODIS-CERES**.
15. Processing and using in situ data from **Global Tropical Moored Buoy Array (GTMBA) and Ocean Moored Buoy Network for northern Indian Ocean (OMNI)** buoys in the global tropical oceans for weather and climate forecasting.

Teaching

1. 2018 - Present: Atmospheric Dynamics and Synoptic Meteorology (1ME424), 10 credits, Department of Earth Sciences, Uppsala University.
2. 2018 - Present: Statistics and Data analysis methods (1HY013), 5 credits, Department of Earth Sciences, Uppsala University.
3. 2018 - Present: Observe, analyse, and present weather (1ME423), 5 credits, Department of Earth Sciences, Uppsala University.
4. Course Coordinator: CEFO PhD-course Spring 2021: Climate Change Leadership – Actors and Strategies for Societal Transitions (FTN0242), 5 credits, CEMUS, Department of Earth Sciences, Uppsala University.

Technical skills

1. NOAA Pyferret, MATLAB, CDO, FORTRAN, and NCO data processing and visualisation.
2. Python for data processing, visualisation, and machine learning model development.
3. Knowledge of C, C++, R, GNU packages, PyGMT, Adobe Illustrator, NCL, Grads, and GNUPLOT.
4. Comfortable with different operating systems like Windows, Linux, and Unix.
5. Experience using workstations, high-performance computing (HPC), supercomputers, and cloud computing resources like Globus.
6. Good knowledge of using several data formats and efficiently handling large and global datasets from different platforms such as in-situ, reanalysis, satellites, models, etc.
7. Experience in documenting and presenting work, both technically and scientifically, using tools like MS Office, Overleaf, Libre Office, and Google Office apps in the cloud.
8. Experience with international projects and interdisciplinary collaboration.
9. Experience working in large systems with shared development like git and data repositories like Zenodo, Figshare, PANGAEA and SND.

Scientific computing and modelling

- Experience using **TECA-BARD, a Bayesian framework** for parallel data analytics on large-scale systems for uncertainty estimation in mapping atmospheric rivers.
- Experience using **dynamical system theory, extreme value theory, large deviation theroy and mathematical statistics** for large-scale systems for uncertainty estimation in complex dynamical systems.
- **IPART (Image-Processing-Based Atmospheric River Tracking)** is a Python package for automated Atmospheric River (AR) detection, axis finding, and AR tracking from gridded Integrated Vapor Transport (IVT) data, such as outputs from numerical models and reanalysis.
- Worked with numerical models such as **MOM, EC-Earth, WRF, GISS GCM-ROCKE-3D**, etc.
- Experience using HPCs like SNIC, UPPMAX, ALVIS, NAISS, ECMWF MARS, ENCCS, etc.
- Experience in handling large datasets from NASA Earth Data, EUMETSAT, ESA, ECMWF, NOAA, Copernicus Data Store (CDS), APDRC, CMIP, and CORDEX, etc., and different file formats like GRIB, NetCDF, Binary, Text and CSV, etc.
- Actively involved in eSSENCE, a strategic collaborative research programme in e-Science between Uppsala University, Lund University and Umeå University.

Languages

- Telugu, English, Hindi (Intermediate), Tamil (elementary), Swedish (beginner)
- Admitted to Swedish for Academics course, Uppsala University and Swedish A1 courses during 2022, but yet to complete them.

Publications

Please find my publications and ongoing work below.

1. **ResearchGate:** https://www.researchgate.net/profile/Venugopal_Thallam/contributions
2. **Google Scholar:** https://scholar.google.ru/citations?hl=en&user=cIz45qQAAAAJ
3. **Orcid:** https://orcid.org/0000-0001-7771-1693
4. **Kudos:** https://www.growkudos.com/hub/82080/publications
5. Preprints: https://www.researchsquare.com/home
6. Venugopal Reddy Thallam - Uppsala University (uu.se)

For more information on my studies, courses, ongoing research and teaching experience, research papers, professional services, other information, and assignments, please visit
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https://github.com/venugopalrt

References

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