Ratnaksha Lele

Postdoctoral Scholar, Scripps Institution of Oceanography, UCSD
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Education

Scripps Institution of Oceanography, UC San Diego Sep 2023
PhD in *Physical Oceanography*
Scripps Institution of Oceanography, UC San Diego Dec 2018
MS in *Physical Oceanography*
VIT University Jun 2016
BS in *Mechanical Engineering*

Work Experience

- **Postdoctoral Researcher, Scripps Institution of Oceanography** *Sep 2023 - Present*
  Remote
  – Project lead on development of explainable-AI methods (non-Linear Regression, GANs) to reconstruct state variables and mapping sea level potential in the deep ocean.
  – Trained ML models using GPU-based HPC clusters on global Deep Argo and hydrography data, outperforming contemporary global climataological data on average by a factor of 10.
- **Data Scientist, Corteva Agriscience** *Mar 2023 - Sep 2023*
  Johnston, IA
  – Data science lead on multiple projects on ML engineering team to develop AI models and scalable data pipelines, increasing accuracy of in-season corn yield forecasts for >1M US corn fields.
  – Collaborated on developing end-to-end data-driven seed product recommendation system using environmental and genetic features, ensuring customer satisfaction and increasing business value.
- **Data Scientist Intern, Jupiter Intelligence** *Jun 2022 - Sep 2022*
  Remote
  – Project lead on engineering and testing a pilot machine learning model to predict coastal flooding in future climate scenarios along the US coastline.
  – New modeling framework increased flood modeling accuracy, while cutting model training cost by up to 80%.
- **PhD Candidate Researcher, UC San Diego** *Sep 2016 - Sep 2023*
  La Jolla, CA
  – Project lead on multiple research projects using time series analysis, statistical and ML methods and instrumentation development to advance understanding of the ocean's role in the climate system.
  – Used advanced statistical and modern ML methods using deep learning, gaussian mixture models and decision trees leading four publications and $200k in grant awards.

Technical Skills

Languages: Python, MATLAB, C, SQL, Julia, Bash, LaTeX
Software Dev: Gitlab, CI/CD, HPC Computing (Azure/AWS)
ML Tools: PyTorch, OpenCV, Dask, Xarray, Databricks
Dev Tools: Git, VS Code, PyCharm, Jupyter Suite, Docker

Awards

NASA Earth and Space Science Fellowship	2020
JPL Center for Climate Science Summer School	2020
Scripps Departmental Award for Research Excellence	2017
University of California Regents Fellowship	2016
WHOI Summer Student Fellowship	2015

Publications

[1] **R Lele** and SG Purkey, Understanding Full-Depth Steric Sea Level Change in the Southwest Pacific Basin using Deep Argo, *Geophysical Research Letters*, 51 (11), 2024.

[2] **R Lele**, SG Purkey, JA MacKinnon and JD Nash, Global Regimes of Turbulent Mixing using Unsupervised Embedded Clustering of Hydrographic Data, *Journal of Geophysical Research: Oceans*, In Review, 2024.

[3] JD Nash, **R Lele**, SG Purkey, and JA MacKinnon, Estimating χ using fast-response thermistors on traditional shipboard CTDs: sources of uncertainty and bias., *Journal of Atmospheric and Oceanic Technology*, In Review, 2023.

[4] **R Lele**, SG Purkey, JA MacKinnon, AM Thurnherr, CB Whalen et al., Abyssal Heat Budget in the Southwest Pacific Basin, *Journal of Physical Oceanography*, 51 (11), 2021.

[5] ST Cole, JM Toole, **R Lele**, M-L Timmermans, SG Stanton et al., Ice and ocean velocity in the Arctic marginal ice zone: Ice roughness and momentum transfer, *Elementa: Science of the Anthropocene*, 5:(55), 2017.

Presentations

1. SG Purkey and **R Lele** A Full-Depth Sea Level Rise Budget in the Southwest Pacific Basin. *Ocean Sciences Meeting*, New Orleans LA, Feb 2024, Talk.
2. **R Lele**, SG Purkey et al., Global Regimes of Turbulent Mixing using Unsupervised Embedded Clustering of Hydrographic Data. *Ocean Sciences Meeting*, New Orleans LA, Feb 2024, Talk.
3. **R Lele**, Into the Abyss: Assessing Meridional Heat Transport, Turbulent Mixing and the Effects of Warming in the Deep Ocean. *PhD Dissertation Defense*, San Diego CA, Sept 2023, Talk.
4. **R Lele** et al, Abyssal Mixing in the South West Pacific Basin. *Ocean Sciences Meeting*, San Diego CA, Feb 2020, Talk.
5. **R Lele** et al, Recipes of Turbulent Mixing from the South Pacific. *Gordon Research Conference on Ocean Mixing*, Andover NH, June 2018, Poster.
6. **R Lele** et al, Decadal Changes in the Properties and Transport of AABW at 32S in the Southwest Pacific Basin. *Ocean Sciences Meeting*, Portland OR, Feb 2018, Talk.
7. **R Lele** and SG Purkey Antarctic Bottom Water Warming in the South West Pacific Basin. *Graduate Climate Conference*, Woods Hole MA, Nov 2017, Poster.
8. **R Lele** et al, An Investigation into Arctic Sea-Ice Dynamics and Energetics. *Ocean Sciences Meeting*, New Orleans LA, Feb 2016, Talk.

References

Sarah G. Purkey, Asst. Professor, UC San Diego, spurkey@ucsd.edu
Jennifer A. MacKinnon, Professor, UC San Diego, jmackinnon@ucsd.edu
Sarah T. Gille, Professor, UC San Diego, sgille@ucsd.edu
Tom Tang, Senior Data Scientist, Corteva Agriscience, tom.tang@corteva.com