Dr. Pushkar Kopparla



Skills

- Scientific python (numpy, matplotlib, pandas, opency, sklearn), GDAL, SQL, QGIS, Rust
- Git, Docker, Slurm, Amazon Web Services including CLI, Google Earth Engine
- Scientific writing and presentation, remote sensing data analysis, atmospheric science

Education

PhD in Planetary Science

California Institute of Technology (Caltech)

MSc in Atmospheric and Climate Science

Eidgenossische Technische Hochschule Zurich (ETH Zurich)

BTech in Engineering Physics

Indian Institute of Technology Delhi (IIT Delhi)

Certifications: Machine Learning Specialization (by Andrew Ng / Coursera), AWS Developer Associate,

Mastering GDAL Tools & Google Earth Engine End-to-End (by Spatial Thoughts)

Work Experience

CSH Fellow (Independent Postdoctoral Researcher) University of Bern

Oct 2020 - Present

Bern, Switzerland

2013 - 2018

2011 - 2013

2007 - 2011

Pasadena, USA

Zurich, Switzerland

New Delhi, India

- created data pipelines to execute sequences of climate simulations on a university high performance computing cluster with a total dataset size of several terabytes.
- developed new measures for estimating model errors and published a paper uncovering a wide-ranging issue that affects most exoplanet climate simulation studies in the past decade.
- initiated a modeling effort to link lab-based measurements of light polarization by single leaves to observations of trees and forests from aerial and space-based imagery for eventual use in exoplanet biosignature detection.
- contributed code to open-source geospatial libraries like xarray, georust, zonebuilder etc.

JSPS Fellow (Independent Postdoctoral Researcher) University of Tokyo

Sep 2018 - Sep 2020

Tokyo, Japan

- designed data pipelines to download, select, clean, impute and analyze hundreds of satellite images of Venus
- conceptualized an unsupervised machine learning analysis (PCA) to identify patterns in images of atmospheric variability and interpreted them in terms of known atmospheric large-scale circulation.
- proposed an innovative theoretical model that solves a 40-year old problem in the field.
- published 5 peer-reviewed journal papers and gave talks at 4 international conferences.
- led seminars to mentor masters and bachelors level students on scientific talks and paper writing.

Graduate Research Assistant (PhD Candidate)

California Institute of Technology

Jul 2013 - June 2018

Pasadena, USA

- developed a fast radiative transfer model that is 100x faster with errors of 0.01% compared to a standard radiative transfer model and was effective in rapid retrievals of greenhouse gases from satellite-based remote
- collaborated with a team of observational astronomers, including assisting in on-site overnight observing at the Gemini North 8-m telescope, leading to one of the very first successful attempts to estimate reflectivity of an exoplanet using polarized light.
- published research results in 8 peer-reviewed papers and gave talks at 10 international conferences.
- served as teaching assistant to four undergraduate courses, led tutorial sessions and geological field trips, and mentored four summer research students.