Abhishek **Prakash**

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CAREER HIGHLIGHTS

Astrophysicist with expertise in analyzing large multi-dimensional datasets. Principle investigator (**P.I.**) and co-investigator of competitive peer-reviewed research proposals. Author of 30+ peer-reviewed journal articles. Reviewer for top international astrophysics journal (ApJ) and NASA NESS fellowship.

EXPERIENCE

Insight Data Science / Drone Base 2019 – present
Real-time assessment of structural damage by drone

- Optimized CNN algorithm, deployable on drones, to detect structural damage in real time, saving visual inspection effort
- Implemented transfer learning with MobilenetV2 neural network using Keras/TensorFlow for damage detection
- Saved two weeks of manual work and 3-4 days of processing time per event through automated damage detection

Caltech/IPAC 2017 – present
Time series modeling and discovery of astrophysical transients

- Extracted observations from space-based optical/infrared images to construct time series of brightest objects in the universe
- Discovered 1000 new rare transient/non-stationary galaxies by employing augmented Dickey–Fuller (ADF) statistics
- Modeled long-term trends using Gaussian random walk

Sloan Digital Sky Survey-IV/eBOSS 2012 – present
Making the largest 3-D map of the universe

- Developed and implemented new algorithms for selecting the most massive galaxies in the universe that have since been widely adopted in the field
- Improved sample efficiency by 20% while leading a team of 12 astronomers conducting analysis of the collected data
- Developed Random Forest regression algorithm for predicting distances to the galaxies based on their brightness, thereby creating the largest and most dense 3-D map of the universe
- Implemented multivariate regression techniques to model a systematic error map for the observed data

EDUCATION

Ph.D. Physics, University of Pittsburgh 2011 – 2017
M.S. Physics, University of Pittsburgh 2011 – 2012
M.Sc. Physics, University of Hyderabad 2007– 2009

TECH SKILLS

Machine Learning
Scikit-Learn, TensorFlow
Random Forest Regression
Neural Networks/Keras
Support Vector Machines

Statistical Modeling
Multivariate Regression
Receiver Operating Characteristic (ROC)
Jackknife sampling
Gaussian random process

Languages and tools
Python (Numpy, Scipy, Matplotlib, Pandas, Seaborn, Astropy)
Interactive Data Language
Latex

Big data tools
SQL, Jupyter notebooks, SSH, SVN, Git

AWARDS

"**The Architect**" award for Sloan Digital Sky Survey-IV

Arts and Sciences Graduate fellowship for **excellence** in research 2016-17, 2015-16

LEADERSHIP

Referee, ApJ
Reviewer, NASA NESS Fellowship Program
Co-President, Early Career Scientist group (ECS), SDSS-IV, 2014 – 2016