Rishabh Solanki

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https://rishabh01solanki.github.io

Diligent problem solver with resourceful approach to challenges. Leverages Computational Physics expertise to manage ambiguous data with focus on results.

Skills

Independent and collaborative research. Handling complex data. Machine learning. Predictive modeling. Written and verbal technical communication.

Python(expert), Java(expert), Fortran(proficient) C(fluent), Html(fluent)

Experience

UMass Dartmouth / Graduate Researcher
SEP 2021 - PRESENT, USA

Developed, designed and implemented modules for a novel approximate Riemann solver which is significantly robust and faster than the current solvers.

- Reduced the spread of contact discontinuity by almost 70% by implementing a novel steepening algorithm based on Piecewise Parabolic Method (PPM) which led to more resolved and sharper discontinuities.
- Rearchitected, redesigned and documented microphysics modules, enhancing and extending core capabilities and enabling new kinds of stellar models

Classifying Supernovae using Deep Neural Network, *May 2022 - ongoing*

- Developed and trained a Convolutional Neural Network on supernova spectra data from Berkeley SN Ia Program.
- Reduced the supernova classification time from hours (template matching methods) to seconds without compromising on accuracy.
- Implemented segmentation methods that allow for better feature recognition.

University of Petroleum and Energy Studies / Undergraduate Researcher
SEP 2017 - AUG 2018, INDIA

Developed orbital analysis and collision detection program using machine learning.

- Reduced runtime by 20% by implementing error-based step size control and optimizing the step size in RK4 interpolation scheme.
- Created a machine learning algorithm that trained itself in real-time on data produced by the orbital analysis module which led to a ML based collision avoidance system

Instruments Research and Development Establishment / Intern
MAY 2017 - SEP 2017, INDIA

- Increased the performance of adaptive optics systems. Collaborated with a team of 10 from IRDE, wrote and documented code to obtain centroidal shift which led to refined modeling of refractive index parameter and improved the angular resolution from 3 arc-sec to 10 milliarc-sec.

Education

University of Massachusetts Dartmouth / MS Physics
SEP 2021 - MAY 2023,

- Designed, managed, and taught recitation and laboratory classes consisting of 50+ students in the undergraduate series, Physics for Science and Engineering.

University of Petroleum and Energy Studies / BS Aerospace Engineering
SEP 2018 - MAY 2018