Saurabh Deshpande

Computational Scientist

Webpage Linkedin

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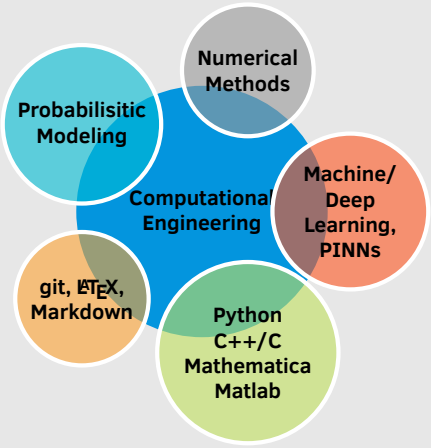
Overview



Skills

ML/DL: TensorFlow, TensorFlow Probability, Keras, PyTorch, Scikit-learn

Courses: Oxford machine learning school, Data visualisation, Uncertainty quantification, Advanced discretisation methods, Operations research

Extra Curricular

Sports

- Hostel **squash & TT captain** at IIT
- Represented IIT in inter-college TT tournament 'Sportfest'
- Represented Latur district in Maharashtra **state level** TT tournaments
- **2 gold** & **2 silver** medals in squash and **1 gold** & **1 silver** medal in water-polo in IIT inter hostel tournaments
- Member of ISRO table tennis (TT) and football team
- Represented the Uni. of Luxembourg in the PCU Chess cup, Antwerp

Music

- Written/composed two songs, available on major streaming platforms.

My webpage

Education

Uni. of Luxembourg	PhD in Scientific Machine Learning (MSCA fellow : ITN RAINBOW)	- *2019 - Present*
IIT Madras	B.Tect + M.Tech in Mechanical Engineering (Minor: Industrial Engineering)	**CGPA: 8.5/10.0** *2012-2017*
Andhra Board	XIIth	**96.70%**

Research Visits

INRIA, Strasbourg	Deep learning for biomechanical simulations	*March 22*
TU Munich	Semester abroad, Mechanical Engineering	*April-July 16*

Publications

Visit my google scholar

Research Experience

Deep learning (DL) surrogate techniques for physics based simulations
PhD thesis at Uni. of Luxembourg *Aug 19 - Present*

- Developing DL techniques (**Bayesian, geometric, physics informed**) for real time simulations of non-linear phenomena in mechanics (Ex. soft body deformations).
- Also working on deep learning techniques for a computer vision application.
- Developed a **probabilistic deep learning framework** for predicting soft body deformations along with the associated uncertainties, refer paper.
- Developed **two novel graph neural network layers**, refer MAgNET paper.

Parallel Processing Numerical Solver for Non-linear Partial Differential Equations
M.Tech thesis at IIT Madras *Aug 16- May 17*

- Developed eXtended Finite Element (XFEM) domain decomposition framework to solve problems in non-linear elasticity in **<4% time** of the conventional method.

Finite Element Tearing and Interconnection (FETI) algorithm *May 16- July 16*
Research Assistant at Technical University of Munich, Germany

- Implemented massively **parallel, domain decomposition** algorithm FETI with the time stepping scheme to solve large scale structural dynamics problems.

Professional Experience

Scientist/Engineer 'SC' in Indian Space Research Organisation (ISRO)
Member of Satellite Payload Mechanisms Team *July 17- May 19*

- Work involved from scratch product realization (mathematical modeling, mechanical design, assembly-integration) for the leading space missions of the country.
- Developed India's first indigenous high accuracy (1') telescope pointing mechanism. My concept was utilized in on-board satellite payload of GSAT-29 satellite.

Selected Awards

- **MSCA fellowship**: Prestigious Marie Skłodowaska Curie Actions funded PhD
- **IIT JEE**: Top 0.5% to get into IIT Madras, the best engineering institute in India
- **Best ML presentation**: Machine learning school, Uni. of Bern (price worth 400 CHF)
- **KVPY fellowship**: Top 0.5% in India to be awarded the prestigious fellowship
- **Regional Maths Olympiad**: State rank 6 in 2009 and state rank 26 in 2011
- **Astronomy Olympiad**: In the top 300 in the country

Positions of Responsibility

Student Representative Positions, Uni. of Luxembourg [Elect] *Aug 21 - Dec 22*

- For the Doctoral School of Science and Engineering (DSSE) (∼600 PhDs)
- For the Doctoral Program in Computational Sciences (∼60 PhDs)
- For the Marie Curie ITN Rainbow network (∼15 PhDs)