

# Maddu Naveen Kumar

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## EDUCATION

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### Indian Institute of Science, Bangalore

PhD (pursuing) in CAD and Deep Learning  
Centre for Product Design and Manufacturing (CPDM)

Karnataka, India  
*August 2016 - Present*

### Indian Institute of Technology, Hyderabad

Master of Technology (Specialization in Manufacturing); GPA: 8.98/10  
Mechanical and Aerospace Engineering Department

Telangana, India  
*2012 - 2014*

### Indian Institute of Technology, Kharagpur

Bachelor of Technology in Manufacturing Science and Engineering; GPA: 6.32/10  
Department of Mechanical Engineering

West Bengal, India  
*2008 - 2012*

## AREAS OF RESEARCH INTEREST

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- Computer Aided Design (CAD), Machine Learning, Digital Manufacturing

## RESEARCH EXPERIENCE

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### Design of Porous Structures using Machine Learning Methods for targeted functional properties

*PhD Supervisor: Prof. B Gurumoorthy*

*August 2016 - Present*

- Our objective is to automate the realization of a porous structure that meets a user-specified functional requirement.
- Machine learning approach is utilized to predict the geometrical parameters of the porous structure given the desired physical properties. For synthetic dataset, Rhinoceros 3D CAD application is used to create CAD models. The corresponding physical properties extracted using COMSOL Multiphysics and ANSYS Mechanical APDL.
- Validation of the model is performed through physical prototyping of the porous structures using the additive manufacturing process and testing.

### FEA Modelling of Weld-deposition based Additive Manufacturing for the Residual Stress Prediction

*M.Tech Supervisor: Prof. Suryakumar S*

*May 2013 - June 2014*

- We studied the effect of area-filling paths on the residual stresses developed during weld-deposition. FEA for these three patterns was done using ANSYS Mechanical APDL.
- For validation, the weld-deposition experiments were done using twin-wire GMAW welding set up, and residual stresses were measured using an X-ray diffraction (XRD) system.

## PUBLICATIONS

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- **M Naveen Kumar** and B Gurumoorthy. Design of Porous Structures. *Computer-Aided Design and Applications*, 18(4), 2021, 704-713., [Paper-link](#)
- MA Somashekara, **M Naveenkumar**, Avinash Kumar, C Viswanath, and S Simhambhatla. Investigations into effect of weld-deposition pattern on residual stress evolution formetallic additive manufacturing. *The International Journal of Advanced ManufacturingTechnology*, 90(5-8):2009–2025, 2017., [Paper-link](#)
- **M Naveen Kumar** and B Gurumoorthy. Design of Porous Structures. *Proceedings of CAD'20, Barcelona, Spain, July 6-8, 2020*, 214-219.
- **M Naveenkumar**, MA Somashekara., S Suryakumar, and C Viswanath. Studies on effect of area-filling pattern on residual stress evolution in weld-deposition based additive manufacturing. *2nd International Conference on Progress in Additive Manufacturing (Pro-AM 2016)*, May 16-19, NTU, Singapore.
- MA Somashekara, **M Naveenkumar**, Avinash Kumar, Vinayak Mathur, Abhay Sharma, S Suryakumar and Viswanath Chinthapenta. Thermo-Mechanical Modelling of Arc Welding. *International Symposium Globalization in Joining Technology and Materials Science - Enhancing Collaboration Network in Greater Asia Region*, October 14, Osaka University, Osaka, Japan.

## INDUSTRY EXPERIENCE

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### Executive Trainee (ET)

*Heavy Engineering Corporation Limited*

Ranchi, India

April 2014 - Aug 2015

- Prepared and distributed weekly production schedules, monitored material supply flow and identified any deficits in usage.
- Prepared routing sheets for different jobs and acted as a link between the production bay and inspection bay in shop floor.

## TEACHING EXPERIENCE

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- Taught **Engineering Mathematics, Strength of Materials, Manufacturing Science and Industrial Engineering** subjects for graduate students for their GATE exam preparation in different institutions across India as a **part-time faculty** for **6 years**.

## RELEVANT COURSES DONE

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### Core Courses:

Geometric Modelling for Computer Aided Design, Data Structures and Algorithms, Numerical Linear Algebra, Dynamics and Control of Mechanical Systems and Introduction to Robotics

### Online Courses:

Machine Learning A-Z™: Hands-On Python & R In Data Science, Udemy online course by Kirill Eremenko and Hadelin de Ponteves.

## SKILLS

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### Programming skills:

Python, C++, Matlab, LaTeX

### Design and Computational software:

SolidWorks, Rhinoceros 3D, COMSOL Multiphysics, ANSYS Mechanical APDL.

## HOBBIES

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I love trekking, cooking, playing badminton & basketball, reading books and watching movies.