
# NANDA KISHORE **BELLAM MURALIDHAR**

**RESEARCH SCIENTIST - Computational Sciences in Engineering**

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## ABOUT ME

Currently working as a research scientist with an extreme passion for developing numerical models, conceptualizing stochastic data assimilation algorithms and programming to quantify uncertainties in any applications related to lightweight structures. With an entrepreneurial mindset, I enjoy working with a systematic approach toward solving any challenge that I take up.

## WORK EXPERIENCE

**Research Scientist** — ***Braunschweig***
**Institute for Analysis und Algebra at TU Braunschweig** — ***since 08.2020***

- Developed efficient fast computing FEM models to analyze guided wave propagation in a fiber-metal laminate structure containing damage - Accelerated 33.8 times by model reduction
- Successfully adapted stochastic data-assimilation algorithms to infer the parameters of damage in the structure and also to quantify their uncertainties with high accuracy
- Supervising student project: "Solving PDEs using physics-informed neural networks with Pytorch"
- Project management and consulting other subprojects regarding the parameters of sensor design and optimal positioning in the structure >> Software: COMSOL, MATLAB and Python

**Research Student** — ***Renningen***
**Robert Bosch GmbH - Corporate Research & Development** — ***09.2019|02.2020***

- Developed and analyzed FEM software part for a digital twin technology to estimate the lifespan of carbon fiber reinforced plastic composite plate under fatigue loading
- Estimated and validated the delamination propagation and residual compression strength of the CFRP plate with a 96.7 % accuracy >> Software: ABAQUS (Standard and Explicit) and Python

**Intern** — ***Bühl***
**Robert Bosch GmbH** — ***03.2019|08.2019***

- Nonlinear dynamic FE-Analysis to understand the frictional behavior of metallic parts under a cold forming process and automated the model with Python for parametric studies
- Consulted customers on design optimization of injection molded parts by conducting several static/dynamic analyses >> Software: ABAQUS (Standard and Explicit) and Python

**Student Research Assistant** — ***Braunschweig***
**Institute for Dynamics and Vibrations at TU Braunschweig** — ***07.2018|12.2018***

- Implemented methods of uncertainty quantification for tutorials - Generalized polynomial chaos method, Markov chain Monte Carlo simulations and surrogate modeling >> Software: Python and MATLAB

**Graduate Engineer - Production** — ***Hosur, India***
**Taneja Aerospace and Aviation Limited** — ***05.2016|04.2017***

- Supervised machining processes in the machine shop and assisted in drafting value stream mapping to increase the production rate
- Designed and conducted suitable experiments to estimate material properties

## EDUCATION

**Master of Science in Computational Sciences in Engineering** — ***Braunschweig***
**Technische Universität Braunschweig** — ***2017|2020***

Finite element simulation of crack propagation and residual strength of carbon fiber reinforced composite plate
Grade: 1,7 (Good)

**Bachelor of Engineering in Mechanical Engineering** — ***Hosur, India***
**Adhiyamaan College of Engineering** — ***2012|2016***

Finite element analysis of double-wishbone suspension of an All-Terrain vehicle
Grade: 9.37 (Very good)

## OTHER PROJECTS

- Algorithmic swing trading based on technical and fundamental KPIs using Python
- Business intelligence projects to get insights about a company using SQL and Python

## CORE COMPETENCIES

Scientific computing | Stochastic Data-assimilation | Parametric model-order reduction | Surrogate modeling | Bayesian Inference | Uncertainty Quantification | Structural-Health Monitoring | Algorithmic Swing Trading | Optimization| Programming

## SOFTWARE SKILLS

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|---|---|
| **ABAQUS, COMSOL** | professional expertise |
| **Python, MATLAB, LATEX** | professional expertise |
| **MySQL, MS Office** | professional expertise - predominantly for private projects |
| **CREO, PowerBI** | intermediary knowledge through projects during studies |

## LANGUAGES

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|---|---|
| **English** | C1-Level |
| **Deutsch** | B2-Level |
| **Telugu** | Mother Tongue |
| **Tamil** | C1-Level |

## PUBLICATIONS

- Parametric Model Order Reduction of Guided Ultrasonic Wave Propagation in Fiber Metal Laminates with Damage **https://doi.org/10.3390/modelling2040031**
- Damage Identification in Fiber Metal Laminates using Bayesian Analysis with Model Order Reduction **https://doi.org/10.1016/j.cma.2022.115737**
- Numerical Analysis of the Main Wave Propagation Characteristics in a Steel-CFRP Laminate Including Model Order Reduction **https://doi.org/10.3390/acoustics4030032**

## HOBBIES

Playing Cricket | Algorithmic swing trading | Listening to Podcasts | Valuation of companies

Nanda Kishore BM