

Bikramjit Karmakar

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EXPERIENCE

- **Raytheon Technologies** July 2020 – Present
Margaret Ingles Engineering Development Program Associate Bengaluru, India
Margaret Ingles Engineering Development Program (MIEDP) is an entry-level, two-year leadership development program for engineering students from around the world that cycles engineers through four, six-month rotations across the enterprise
 - **Rotation 2 -Systems Engineering, Collins Aerospace (Feb'21 - ongoing)** : Developed and implemented a novel, scalable and extremely accurate methodology for remaining useful life prediction for Model Based Prognostics. Successfully demonstrated the use on component level.
 - * Tags: **Kalman Filters; Statespace Models; Time Series**
 - **Rotation 1 - Interiors Technology, Collins Aerospace (Jul'20 - Feb'21)** : Developed a image-processing module to accurately quantify 2D strains from image batch for fabric composite modelling. Designed and performed experiments for model's validation. Developed a Phase Change Heat Exchanger model and implemented a breathing profile model for oxygen systems.
 - * Tags: **Fabric Composite Modelling; Computer Vision (OpenCV, PIL, imutils); Phase-Field**

KEY COMPETENCIES

- Physics based Modelling
- Machine Learning
- Systems Engineering
- Multi-scale Modelling
- Deep Learning
- High-Performance Computing
- Material Characterization
- Computer Vision
- Optimization

EDUCATION

- **Indian Institute of Science (IISc)** Bengaluru, India
Class of 2020 Aug. 2015 – July 2020
 - **Bachelor of Science(Research) and Master of Science in Materials Science**
 - CGPA(secured/maximum): 6.4/8, Masters' GPA(secured/maximum): 7.6/8

INTERNSHIP POSITIONS

- **Karlsruhe Institute of Technology** Karlsruhe, Germany
With Prof. Britta Nester's Group on Phase field modelling of solute trapping May-July 2018
- **Dept. of MSE, IIT Kanpur** Kanpur, India
With Prof. Rajdip Mukherjee's Group on Effect of Grain Boundary Mobility on Grain Growth June-July 2017
- **Centre for Data Sciences(CDS), IISc** Bengaluru, India
With Prof. K Sekar's Group on Mathematical Model to predict 3-D structural overlap of multiple protein June-July 2016

SKILLS

- **Programming Languages:** C, C++, Python **Technologies:** Octave, Matlab, Simscape & Simulink
- **Scripting:** Shell, Perl **Visualization/Plotting:** OriginLab, SciDavis, GnuPlot, ParaView
- **Multi-Physics:** Quantum Espresso (DFT); PACE3D (Phase-field); LAMMPS & GROMACS (MD/MC), OpenFOAM
- **Others:** LATEX, Microsoft Office(Word, Excel, Powerpoint), Arduino
- **Python Libraries:**
 - **Basics:** NumPy, SciPy, Pandas, Matplotlib etc. **Computer Vision:** OpenCV2, PIL, imutils
 - **Machine Learning:** scikit-learn, statsmodels **Deep Learning Frameworks:** Tensorflow, Keras

OPEN-SOURCE CONTRIBUTIONS

- **ICME, India:** Integrated Computational Materials Engineering (ICME), India is a set of open-sourced tools developed by IISc and IITs to integrate and accelerate materials discovery and understanding.
 - Contributed the OpenFOAM based **load balanced & parallelized adaptive mesh solvers for Phase-Field** to accelerate simulation **upto 15 times**.

THESIS

- **Bachelor's Thesis:** Computational modelling of Rapid Solidification (non-equilibrium phase transformation) using Phase Field
Advisor: Dr. Abhik Choudhury **Grade:** 8/8
Worked on the models and changes needed to **incorporate the dynamics of rapid solidification** in Phase Field Models
- **Masters's Thesis:** Analytical and Computational modelling of Microstructures during Rapid Solidification (non-equilibrium phase transformation) using Phase Field
Advisor: Dr. Abhik Choudhury **Grade:** 8/8
Worked on simulating complex microstructures like dendrites during non equilibrium phase transformation. Developed **parallelized adaptive mesh solvers** for phase-field on OpenFOAM giving upto **15x speedup**.

AWARDS/ RECOGNITION

- **Best Masters Thesis Nomination:** Nominated for the best masters' thesis award by the department
- **Fellow, Kishore Vaigyanik Prosthhan Yojna (KVPY), 2014:** This is the most prestigious and highest possible scholarship that is awarded in India for Undergraduate Studies
- **Silver Medal, Initiative for Research and Innovation in Science by Intel India, 2014:** Most eminent Science Fair in India, Organised by Dept. of Science and Technology
- **Gujrat Council for Science and Technology award 2014:** Presented by the then Chief Minister of Gujrat at the IRIS National Fair
- **Winner & Best Exhibit, CBSE National Science Fair, 2014:** Organised by Central Board of Secondary Education, with over 10,000 entries

CAMPUS ACTIVITIES

- **Photography Editor, QUARKS Magazine:** Coordinated the photography team and curated the Photography section of the annual undergraduate magazine - QUARKS
- **Sponsorship and Marketing Coordinator, PRAVEGA- Annual UG Festival:** Coordinated and managed a team of 15 people to raise and manage funds (\approx INR 60L) for the UG fest from many multinational companies and organisations
- **Setting up of mental health peer support group - Empaths:** Played a role in setting up a mental health peer support group, in coordination with the Health Centre. Organised talks, campaigns and events for mental health awareness.
- **Various other volunteering activities:** Student Council, Symposiums, Open Day, Notebook drive, etc.