Bikramjit Karmakar

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Experience

- **Raytheon Technologies** July 2020 – Present
  Margaret Ingles Engineering Development Program Associate *Bengaluru, India*

  Margaret Ingels 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 verification and validation. Developed a Phase Change Heat Exchanger model and implemented a breathing profile model for oxygen systems.
    - Tags: **Computer Vison (OpenCV, PIL, imutils); Phase-Field**

Key Competencies

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

Thesis

- **Bachelor's Thesis:** Compuational 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.