Abhishek Shandilya | Curriculum Vitae

415 Godavari Hostel – IIT Madras, Chennai 600036 – India
+91 9884299211 • abhishek.sandy@gmail.com • abhishandy.github.io

Research Interests

- Computational Materials Science
- High Performance Parallel Computing
- Energy Materials
- Computational Fluid Dynamics

Education

Indian Institute of Technology Madras **Chennai, India**
B.Tech & M.Tech, 8.10/10 *2012–2017*
Metallurgical and Materials Engineering

Master Thesis: Modelling fluid flow effects in the mushy zone using lattice Boltzmann method
Advisor: Prof. Gandham Phanikumar

Projects

Modelling fluid flow effects in the mushy zone using lattice Boltzmann method
Advisor: Prof. G Phanikumar *Ongoing*
- Study the effect of convection, density difference and dynamic pressure on microstructure evolution
- Use high performance parallel computing on GPGPU using OpenCL to drastically reduce the simulation time

FEM analysis of high strength and stiffness to weight scaffolds produced by Selective Laser Melting
Advisor: Dr. Anand K Kanjarla *Nov 2015*
- Analyzed the failure modes of porous scaffolds designed for selective laser melting as a function of arm-width

Modelling and Simulation of Frank-Read Source using Molecular Dynamics
Advisor: Dr. Anand K Kanjarla *Oct 2015*
- Simulated a dislocation source for pure Nickel system and analyzed the effect of block size on the dislocation loop
- Parameterized the input files for seamless job submission to GNR computing cluster

Modelling and Simulation of Dendritic Morphology in Solidification of undercooled melt using phase-field and lattice-Boltzmann method
Advisor: Dr. Gerald Tennyson *May–July 2015*
- Modelled and simulated dendritic growth using phase-field method coupled with lattice-Boltzmann model for fluid-flow in the undercooled melt; applied explicit and implicit schemes for solving partial differential equations in C
- Improved simulation time using parallel programming through MPI routines on RedHat cluster

Conference

Poster: Abhishek Shandilya, P Gerald Tennyson and Mahesh Mynam; Modelling and Simulation of Dendritic Morphology in Solidification of undercooled melt using phase-field and lattice-Boltzmann method; NMD-ATM 2015, Coimbatore organised by Indian Institute of Metals

Teaching Experience

Teaching Assistant - Introduction to Transport Phenomena
Faculty: Prof. G Phanikumar *Jan–May 2017*

Professional Experience

Tata Research Development and Design Center **Pune**
Project Trainee *May–July 2015*

- Modelled and simulated dendritic growth using phase-field method coupled with lattice-Boltzmann model for fluid-flow in the undercooled melt; applied explicit and implicit schemes for solving partial differential equations in C
- Improved simulation time using parallel programming through MPI routines on RedHat cluster

AdWyze **Bangalore**
Front-end Web Developer Intern *Dec 2014*

- Improved the UI/UX using CSS, jQuery, DataTables and Bootstrap on Ruby-on-Rails framework
- Setup rigorous front-end form verification for Rules module; received performance bonus and verbatim pre-placement offer

R&D Department, Tata Steel **Jamshedpur**
Industrial Intern *May–July 2014*

- Conducted physical-simulation of various tundish furniture and their effect on residence time distribution (RTD) curves
- Setup sensor mount and designed tracer injector system for seamless simulation while ensuring accurate readings

Computer skills

Operating Systems: Linux, Windows
Programming Lang.: C, C++, Python, Java
Parallel Computing Tools: OpenMP, MPI
GPU Computing: CUDA, OpenCL
Scientific Softwares: MATLAB, ThermoCalc, Abaqus, LAMMPS, SolidWorks

Relevant Coursework

Computational Materials Science

- Basics and Application of Phase-Field Modeling in Materials Science by Prof Mathis Plapp & Dr. Abhik Choudhury (GIAN)
- Numerical Methods for Metallurgists by Prof. KC Harikumar
- Introduction to Multi-Scale Modeling of Materials by Dr. AK Kanjarla
- Computational Material Thermodynamics by Prof. KC Harikumar

Metallurgical and Materials Engineering

- Introduction to Transport Phenomena by Dr. Sabita Sarkar
- Metallurgical Thermodynamics by Prof. G Phanikumar
- Materials Characterization by Prof. M Sundararaman & Dr. SR Bakshi

Computer Science

- High Performance Parallel Computing by Prof. P Sadayappan & Dr. R Nasre (GIAN)
- Machine Learning by Prof. Andrew Ng (Coursera)

Mathematics

- Probability, Statistics and Stochastic Process by Prof. PR Parthasarathi
- Differential Equations by Prof. SG Kamath

Extra Curricular Activities

Technical Competitions

- Member of Design Fabrication Team which represented IIT Madras at the Indian leg of ABU Robocon 2014
- Ranked 6th (Middle East, India, Africa Region) in the 8th Virtual Steelmaking Challenge
- Secured 2nd position in Robo-Oceana, an aqua-robotic event at Shaastra-2013
- 2nd runner-up in Aqua Challenge (Race A), an aqua-robotic event at Quanta-2010
- 1st runner-up in Industrial Defined Problem by Titan Watches

Sports

- Enjoys playing basketball, swimming and cricket
- Completed various cycling marathons up to 200 km as a member of Institute Cycling Club
- Gold medallist in Long Jump in middle school

Web Development

- Developed websites for college events and research groups
- Developed a Time Management Windows App in Microsoft Code.Fun.Do Hackathon

Writing

- Chief-Editor of Immerse - Science Magazine of IIT Madras

Photography

- Captures Nature, Landscape, Animals and Still life using Canon 1200D
- Processing in Adobe Lightroom

Professional Affiliations

Indian Institute of Metals (IIM)
Student member *Since October 2015*

Metallurgy Students Association (MetSA)
Member *Since August 2012*