Rohith Srinivaas Mohanakrishnan

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Education

Program	Institute	Graduation Year	CGPA
Ph.D. in Materials Science and Engineering Advisor: *Prof. Kristin Perrson*	UC Berkeley	2027*	4.0/4.0
B.Tech in Metallurgical and Materials Engineering Interdisplicinary M.Tech in Computational Engineering Minor in Economics	IIT Madras	2021	9.35/10.00

Publications

- Mythreyi OV, **M. Rohith Srinivaas** , Amit Kumar T, Jayaganthan R. *Machine-Learning-Based Prediction of Corrosion Behavior in Additively Manufactured Inconel 718*. Data. 2021; 6(8):80. https://doi.org/10.3390/data6080080
- **M. Rohith Srinivaas**, K C Hari Kumar. *Size- and Shape-Dependent Phase Diagram of Ga-Sb nanoparticles*. Calphad.2022;76.https://doi.org/10.1016/j.calphad.2021.102389

Conference Presentations

- **Rohith Srinivaas M**, Soumya Sridar, K.C.Hari Kumar, *Thermodynamic Modelling of Mo-Zr System using ab initio calculations*, CALPHAD XLVIII, Singapore, 2 - 7 June 2019[Conference Proceedings]
- M. Balan Umaithanu, V. Ravichandran, **M. Rohith Srinivaas** and V. Subramanian Selvaraj, *DeepGRASS: Graph, Sequence and Scaled Embeddings on large scale transactions data*, 2021 Swedish Workshop on Data Science (SweDS), 2021, pp. 1-6,https://doi.org/10.1109/SweDS53855.2021.9638270

Technical Skills

- **Programming:** FORTRAN, Python, C, C++
- **Materials Modelling:** VASP, Quantum ESPRESSO, LAMMPS, Thermo-Calc, Lumerical-FDTD, QMCPACK
- **Machine Learning:** Tensorflow, Keras, Pytorch
- **Scientific Computing:** MATLAB, Mathematica, Open MPI
- **Visualization Tools:** ParaView, VESTA, OVITO

Research Experience

- **Thermodynamic Modelling of Ti-Mo-Zr system**, IIT Madras (Aug 2020 - July 2021)
  Guide: Prof.K. C. Hari Kumar
  - Estimated $\Delta_f G^0(T)$ of Mo_2Zr under **quasiharmonic approximation** using **density functional theory**
  - Used **special quasirandom structures** for $\Delta_f H^0$ of solid solutions using **Alloy Theoretic Automated Toolkit(ATAT)**
  - Optimized **gibbs energy descriptions** of phases from both experimental and ab initio results using **Thermo-Calc**
- **Band Gap & Formation Energy prediction of Al-Ga-In sesquioxides**, Ruhr University, Bochum (June - Aug 2020)
  Guide: Prof. Thomas Hammerschmidt
  - Constructed **average descriptors** from free atomic electronic affinity, ionization potential, atomic volume, radius
  - Computed **12 scaled-moment descriptors** using simple **sp-TB model** up to sixth nearest-neighbor shell
  - With **175 features**, trained **XGBoost** Model for formation energy prediction with **RMLSE value of 0.043**
- **Numerical Simulations of Surface Plasmon Resonance** - NTU, Singapore (May 2019 - July 2019)
  Guide: Prof.Li Shuzhou
  - Developed C++ code using **finite-difference time-domain method** for computational electromagnetics
  - Performed **parametric study** on the size of Au nanospheres to predict **Surface Plasmon Resonance peaks**
  - Computed the size regime where the **red-blue shift** in peaks occur by varying radii in the case of Au nanospheres
- **Size & Shape dependent Ga-Sb phase diagram** , IIT Madras (Dec 2017- Mar 2018)
  Guide: Prof. K. C. Hari Kumar
  - Calculated surface energy for GaSb for [110], [100], [111] directions using **density functional theory**
  - Used **TCPython** to compute surface tension of different phases with **butler equation** for different radii
  - Optimised **gibbs energy descriptions** and studied **eutectic composition** and **temperature** for different radii

Teaching Experience

- **Teaching Assistant**, IIT Madras (Aug 2020 - July 2021)
  - Developed Jupyter Notebooks and Tutorial Sessions for **Thermodynamic of Materials** for a class of 57 students
  - Conducted Quizzes and Tutorial Sessions for **Advanced Phase Transformations** for a class of 36 students
- **Teaching Assistant**, Online B.Sc Program, IIT Madras (Nov 2021 - Present)
  - Created content and evaluation scripts in python for assignment evaluation for the course **Tools for Data Science**
  - Live-video tutorial sessions for 100+ students were conducted under the course **Tools for Data Science**

Relevant Coursework

Materials Engg.	Electronic materials, devices, and fabrication, Thermodynamics of Materials,, Transport Phenomena of Materials, Deformation and Failure of Materials, Physics of Materials, Phase Transformations, Atomistic Modelling of Materials, Foundations of Computational Materials Modelling, Computational Thermodynamics.
Computational Engg.	Computational Fluid Dynamics, Numerical Optimization, Reinforcement Learning Numerical Methods in Thermal Engineering, Introduction to Data Analytics, High Performance Computing for Engineering Applications.

Achievements

- Received **S Anantha Ramakrishnan Memorial Prize** for being the Dual Degree student with the highest CGPA in the Department of Metallurgical and Materials Engineering.
- Received **Merit Cum Means Scholarship** and **Ram Shriram Merit Scholarship** for excellent academic performance
- Awarded **Best Paper Award** for **Segregating dustbins : A new approach to grassroots segregation**, in SRC[1](2018)
- Secured **Silver medal** in the **Campus Sustainability Challenge** in **7th Inter IIT Tech Meet** conducted by IIT Bombay
- Selected among the **200 DAAD-WISE scholars** for research internship in ICAMS[2], Germany with full scholarship
- Ranked among **top 10 %** in **National Standard Examination in Physics** & **National Mathematics Talent Contests** organized by **IAPT**[3] & **AMTI**[4].

Technical Projects

- **Automatic Waste Segregator** — Centre For Innovation(CFI), IIT Madras[5] (Sep 2017 - Feb 2018)
  - Worked on Computer Vision algorithms and Deep learning models for classification of household waste
  - Achieved accuracy of **92%** by transfer learning over **Inception-V2-resnet** using **Tensorflow** Framework
  - Selected for the international finals of **Hult Social Entrepreneurship prize** and got featured in **Times of India**
- **Hand Gesture Control of Robots** — Centre For Innovation(CFI), IIT Madras[5] (Sep 2017 - Nov 2017)
  - Implemented Computer Vision models for detecting fingertips as feature locations on egocentric hands images
  - Finetuned **You Only Look Once** object detection model and cascaded a **bounding box regressor** over it
  - Established **dynamic control** of an omnidirectional wheel driven robot using serial communication

Professional Experience

- **Data Scientist** - Global Data Sciences - PayPal Chennai (July 2021 - Jan 2023)
  - Improved **PU Learning** approach by constructing a **Pseudo-F measure** to recommend credit products in checkout
  - Worked on fixed-window algorithm, improving recommendation of credit products using α-**exploitation** strategy
  - Secured 1^{st} **position** in Innovation Hackathon, for **employee-connect** recommendation system using graph learning
- **Data Science Intern** - Global Data Sciences - PayPal Chennai (June 2020 - August 2020)
  - Implemented feature extraction code of **6 feature sets** accounting to **4000+ features** based on profile photos
  - Outperformed **precision,recall** scores for **age,gender,ethnicity** prediction by **10 %** than the current best methods
  - Trained Personality Prediction Model to obtain the personality trait based on **Big-Five Personality traits**
- **Computer Vision Intern** - DeTect Technologies, Chennai (May - July 2017 & May - July 2018)
  - Worked on **Undistortion** for GoPro Cameras and on automating the **report generation** process
  - Implemented **Segmentation algorithms** like **Structured Forests**, **W-net** for Automatic fault detection
  - Worked on **Object Detection** for surveillance and fault identification using **SSD** & **Faster RCNN** using **Tensorflow**

[1] Student Research Conference
[2] Interdisciplinary Centre for Advanced Materials Simulation, Ruhr University, Bochum
[3] Indian Association of Physics Teachers
[4] Association of Mathematics Teachers of India
[5] Centre For Innovation (CFI) is a forum for student innovation at IIT Madras

Volunteering Activities

- **NSS**[6] : Conducted Higher education Guidance and Scholarship awareness session for financially weak students
- **Teach2Learn** : Taught English for 6 orphan students to qualify 10-th English board exams in Tamil Nadu, India
- **Literary** : Organized **Brahm Prakash Memorial Materials Quiz** of **Indian Institute of Metals** for the school students.

References

Prof. Hari Kumar K. C
Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras
Email : kchkumar@iitm.ac.in
Prof. Jayaganthan R
Department of Engineering Design, Indian Institute of Technology Madras
Email : edjay@iitm.ac.in
Prof. Krishnan Balasubramanian
Department of Meachanical Engineering, Indian Institute of Technology Madras
Email : balas@iitm.ac.in

[6] National Service Scheme