Ranga Teja Pidathala
Graduate Research Assistant

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Research group website: PMML group

EDUCATION

University of Louisville **Louisville, KY**
Ph.D., Mechanical Engineering *Jan'2021-present*
Thesis: "Understanding the defect dynamics in strongly correlated perovskite oxides for emerging neuromorphic (brain-like) computing"
Advisor: Dr. Badri Narayanan

Indian Institute of Technology **Gandhinagar, India**
M.Tech., Materials Science and Engineering *August 2020*
Thesis: "Failure detection of bioimplants using stable tracers in vitro: A pathway for implant health diagnosis"
Advisors: Dr. Abhay Raj Singh Gautam, Dr. Superb Misra

Vignan's University **Guntur, India**
B.Tech., Mechanical Engineering (Major), Information Technology (Minor) *June 2016*

ACADEMIC APPOINTMENTS

Graduate Research Assistant **2022-present**
Predictive Materials Modeling Lab (PMML) group, Mechanical Engineering, University of Louisville

Graduate Teaching Assistant **2021-2022**
Mechanical Engineering, University of Louisville

Graduate Teaching Assistant **2018-2020**
Indian Institute of Technology, Gandhinagar, India

RESEARCH INTERESTS

- Applying Density Functional Theory (DFT), Ab *initio*, classical and reactive molecular dynamics simulations to understand the various phenomena occurring at atomic length scale.
- Understanding the Metal Insulator Transition (MIT) in strongly correlated perovskite oxides.
- Studying the effect of different anion additives on the performance of the Fe-alkaline batteries.

- Understanding the mechanical behavior of the refectory medium entropy alloys and solute segregation in Al-θ′ interface in Al-Cu alloys
- Studying the effect of substrate-organic ligand interactions on crystal growth, self-assembly and kinetics of Metal Organic Frameworks (MOF)
- Exploration of Ir-doping on WO_3 catalyst for Oxygen Evolution Reaction (OER).
- Deep Learning techniques for computationally exploring new materials.

AWARDS AND ACHEIVEMENTS

1. **Hsing Chuang award for excellence in graduate study**
   J.B. Speed School of Engineering, University of Louisville, 2023. Won a cash prize of $1000.

2. **Battery informatics and ML competition**
   Jointly organized by Toyota Research Institute and University of Maryland at MRS fall meeting 2023. Won $250 for ranking #1 in MRS category and $100 for ranking #3 in overall category.

3. **Nominated for overall best Master's student award.**
   Indian Institute of Technology, 2020

4. **Award for Academic excellence in Mechanical Engineering (undergraduate)**
   Vignan's University, Guntur, India, 2013-2015. Won a cash prize worth of $600, consecutively for Freshmen, Junior, and Senior academic years.

5. **Featured in newspaper** for securing 49th rank in national level talent test conducted by "*Unified Cyber Olympiad-2009*" while studying in high school.

INTERNSHIPS

1. **Indian Institute of Technology, Gandhinagar (Independent project)** **June'19 - August'20**
   Project #1: "Understanding the deformation mechanism in light weight high entropy alloys using molecular dynamics simulations.

   Project #2: "Effect of dopant segregation at the grain boundary interface in a bicrystal using hybrid MD (Molecular dynamics and Monte-Carlo)
   Advisor: Dr. Raghavan Ranganathan

2. **Indian Institute of Technology, Guwahati (Summer internship)** **May'15 – August'15**
   Project: "Developed a computational model for optimizing the fin dimensions of the concrete bed for applications to sensible thermal energy storage systems using COMSOL (finite element method)
   Advisor: Dr. Chandramohan Somayaji

3. **Jawaharlal Nehru Technological University Hyderabad (Winter internship)** **January'14**
   Project: "Industry Internship Programme on Automobile & Engine Designing using Reverse Engineering methods"

conducted by SGT International & Metawing Technologies Pvt Ltd.

PUBLICATIONS

Total publications: 2, Lead Author for computations in Co-authored articles: 2
Google scholar metrics: Citations - 13, h-index -2, i10-index – 1
(Google Scholar Profile)

1. Fenghua Guo, Sathya Narayanan Jagadeesan, Ranga Teja Pidathala, SaeWon Kim, Xiaoqiang Shan, N Aaron Deskins, AM Milinda Abeykoon, Gihan Kwon, Daniel Olds, Badri Narayanan, Xiaowei Teng. *Revitalizing Iron Redox by Anion-Insertion-Assisted Ferro-and Ferri-Hydroxides Conversion at Low Alkalinity.* **JACS**, 144, 27, 2022

2. Xiaoqiang Shan, Ranga Teja Pidathala, SaeWon Kim, Wenqian Xu, Milinda Abeykoon, Gihan Kwon, Daniel Olds, Badri Narayanan, Xiaowei Teng. *Exemption of lattice collapse in Ni–MnO 2 birnessite regulated by the structural water mobility.* **J. Mater. Chem. A,** 9, 2021

3. Sathya Narayanan Jagadeesan, Fenghua Guo, Ranga Teja Pidathala, A.M. Milinda Abeykoon, Gihan Kwon, Daniel Olds, Badri Narayanan, and Xiaowei Teng. *Enable High Capacity and Reversible Alkaline Iron Redox in Silicate-Sodium Hydroxide Hybrid Electrolytes.* **ChemSusChem**. (In review)

4. Ankit Singh Negi, Ranga Teja Pidathala, Samarendra Roy, Shibayan Roy, Badri Narayanan, Rajdip Mukherjee. *Effect of interface segregation on coarsening of θ′ precipitates in Al-Cu-X alloys (X = Zr, Mn): A multiscale modelling approach.* Potential venue: **Com. Mat. Sci.** (In preparation)

5. Mirza Galib, Ranga Teja Pidathala, and Badri Narayanan. *Machine learning interatomic potentials to understand dynamics of metal-insulator transition in strongly correlated perovskite nickelates*. **npj Computational Materials.** (submitted)

6. Ranga Pidathala, and Badri Narayanan. *Formation and migration of oxygen vacancies in oxygen-deficient strongly correlated samarium nickel oxide*. **Nanoscale.** (preparation)

7. Devang Bhagat, Ranga Pidathala, and Badri Narayanan. *Electronic properties of oxygen-deficient strongly correlated rare-earth nickelates and their effect on change in A-site cation*. **PCCP.** (preparation)

CONFERENCE PRESENTATIONS

1. Ranga Teja Pidathala, Devang Bhagat, Mirza Galib, Badri Narayanan. *Understanding correlations between structure, electronic properties, and oxygen vacancy migration in rare earth nickelates*. **MRS Fall meeting**, 2022.

2. Ranga Teja Pidathala, Devang Bhagat, Mirza Galib, Badri Narayanan. *Understanding correlations between structure, electronic properties, and oxygen vacancy migration and effect of A-site cation in rare earth nickelates*. **NNCI**, 2022.

3. Bharti Malvi, Ranga Teja Pidathala, Nishaben Patel, Swaroop Chakraborty, Superb K Misra, Abhay Raj Singh Gautam, Virupakshi Sopinna, Nilabh Dish. *Antimicrobial effect of Ag nano island deposited on SS316L by physical vapour deposition.* **ICASS, Spain.** 2022

4. Ranga Teja Pidathala, Raghavan Ranganathan. Mechanical behaviour of AlFeCuMgSi light weight high entropy alloys under uniaxial tension and compression using atomistic simulations. **ICHEM, India**, 2020

MENTORING

(Undergraduate students at University of Louisville)

1.	Y. Milli Lu	Tufts University	Summer 2021, Won best poster award #1
2.	Myles Josiah	University of Kentucky	Summer 2022
3.	Madeline W. Warren	Bellarmine University	Summer 2023, Won best poster award #3

TEACHING

Grader, University of Louisville **Fall 2021**
Courses: ME- 414 Mechanical Measurements, ME -512 Finite element methods
Responsibilities: Grading weekly assignments, quizzes and exams and maintaining them in blackboard

Instructor, Indian Institute of Technology, Gandhinagar **Spring 2020**
Course: MA – 602 Advanced numerical methods in engineering
Responsibilities: Prepared codes in MATLAB for numerical methods and taught graduate students. Proctored the exams, graded coding assignments.

Instructor, Indian Institute of Technology, Gandhinagar **Fall 2019**
Course: MSE – 632 Characterization of materials
Responsibilities: Taught the lab component of the course demonstrating each characterization technique to the graduate students. Prepared assignments for the course and graded the same.

Instructor, Indian Institute of Technology, Gandhinagar **Fall 2018**
Course: MSE – 303 Mechanical behavior of materials
Responsibilities: Taught the lab component of the course demonstrating various testing techniques to the undergraduate students. Prepared assignments for the course and graded the same.

LEADERSHIP EXPERIENCE

Graduate Student Regional Research Conference **Spring 2023**
Played key role in designing and organizing the Graduate Student Regional Research Conference along with Director of Professional Development. Chaired oral sessions.

Department Representative, Graduate Student Council **Fall 2021-present**
Representing the graduate students of Mechanical Engineering Department at Graduate student council

Captain, HPVIGNAN, ASME Student chapter **2015**
Lead a team in designing the vehicle and participated in Human Powered Vehicle Challenge organized by America Society of Mechanical Engineers.

CERTIFICATIONS AND MEMBERSHIPS

- **Machine Learning Specialization (DeepLearning.AI & Stanford University)** **Jan'23**
  Online Specialization containing 3 courses, Supervised ML, Advanced learning algorithms and Unsupervised Learning in coursera. Instructor: Andrew Ng (Popular in ML community)

- **Visualization of Data with Python (IBM)** **sep'20**
  Online Course in edX. Instructor: Joseph Santarcangelo

- **Statistical Molecular Thermodynamics (University of Minnesota)** **Fall'19**
  Audited Online course in Coursera. Advisor: Dr. Christopher J. Cramer

- **Deep Learning Specialization (DeepLearning.AI)** **In progress**
  Advisor: Andrew Ng

- **Member of Materials Research Society (MRS)**
- **Member of Electro chemical Society (ECS)**
- **Past member of American Society of Mechanical Engineers (ASME)**

HOBBIES

- Chess (current Chess.com rating: 850 (rapid))
- Badminton
- Cricket
- Volleyball

REFERENCE

Dr. Badri Narayanan
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University of Louisville.
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Dr. Raghavan Ranganathan
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