# Taradutt Pattnaik

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**January 17, 2023**

## EDUCATION Q

**PhD Student** 2021-
*University of Connecticut, Storrs*
Computational Material Science
Advisor: Prof. Pamir Alpay
GPA: 4.0/4.0

**5 year BS-MS** 2016-21
*Indian Institute of Science, Bangalore*
Major: *Material Science*      Minor: *Physics*
GPA: 8.8/10 (First Class with distinction)

## RESEARCH PROJECTS Q

- **Modeling the high strain-rate deformation behavior of epoxy composite in marine environment using MD**:
  *From Jan 2022 to Dec 2022, under Prof Avinash Dongare at University of Connecticut, Storrs*

  * Designed and optimized a procedure to build a computational model of a cross-linked epoxy network from its constituent monomer molecules in LAMMPs.
  * Designed an approach to incorporate water molecules into the epoxy network. This was done to simulate water absorption.
  * Performed uniaxial and biaxial tests to see how the water absorption affects the mechanical behavior of the epoxy network. see more

- **Wrinkling of atomic planes in metallic nanowires**:
  *From Jan 2021 to April 2021, under Prof. N. Ravishankar at IISc, Bangalore.*

  * Used Molecular Dynamics simulations to study the wrinkling of atomic planes in metallic nanowires of different geometries. see more

- **LEDs based on perovskite nanocrystals**:
  *From May 2019 to July 2019, under Dr. Damodaran Bahulayan in Prof. Subodh Mhaisalkar's lab at NTU, Singapore.*

  * Optimized a room temperature synthesis route for lead halide perovskite nanocrystals, characterized them. They were then used to make LEDs. see more

- **Graph Theory**:
  *From May 2017-July 2017, With Prof. Arvind Ayyer at Department of Mathematics, IISc, Bangalore*

  * Studied about Hamiltonian, Eulerian Cycles, Graph Eigenvalues, Connectivity.
  * Implemented BFS, DFS, Prim's and Kruskal's algorithm in C. see more

## COURSE PROJECTS Q

- **Chladni patterns for a square plate with free boundary conditions,** *Computational Physics:* Computed numerical Chladni patterns for a square plate with free boundary conditions. It involved the use of Finite Volume Method (FVM). The programming was done using MATLAB. see more

- **2D phase field simulations,** *Modeling and Simulations in materials engineering :* Solved the Allen-Cahn and Cahn-Hilliard equations for different different starting compositions of a given system. Visualised formation of lamellar microstructure due to spinodal decomposition. see more

- **2D wave equation,** *Numerical Methods:* Solved the wave equation for a 2D square plate for various initial conditions. It involved the use of Finite Difference Method (FDM). The programming was done using MATLAB. see more

- **Bridge game data analysis,** *Practical Data Science:* Using a dataset with 0.5 million entries, built a multiclass classifier in *python* using Xtreme Gradient Boosting(XGBoost) to predict the suites that win the maximum tricks from the starting hand of a given player. see more

- **Smart Bottle Design,** *Computer Aided Design*: Designed a smart bottle. It involved clay sculpting followed by 3D scanning, form refinement using Autodesk Alias and then finally 3D printing the computer model. see more

## Courses 🔍

∗ **Computing:** Algorithms and Programming(G), Numerical Methods(G), Data Analytics(G), Practical Data Science(G), Computer Aided Design(G)

∗ **Materials:** Mechanical Behaviour of Materials, Material Structure, Defects(G), Thermodynamics, Kinetics, Electron Microscopy(G), Manufacturing(G), Corrosion(G), Polymer Science and Engineering(G), Modeling and Simulation in Materials Engineering(G)

∗ **Math:** Analysis, Linear Algebra, Probability and Statistics

∗ **Physics:** Mechanics, Electromagnetism, Quantum physics, Thermal physics, Computational Physics(G)

∗ **Online MOOC:** Neural Networks and Deep Learning, Introduction to DFT

*\*G denotes Graduate Course*

## Awards/Scholarships

- **KVPY Scholar:** KVPY scholarship is awarded by the Department of Science and Technology of Government of India, to top 2% of about 100k applicants through a two stage competitive examination. It provides a monthly stipend upto pre-PhD level and access to national laboratories to support and encourage young science students.

- **NTSE (National Talent Search Examination) Scholar:** Awarded to top 0.01% of 150k applicants by Government of India through a two stage competitive exam

## TECHNICAL SKILLS

- **Programming Languages:** C, Python, HTML, CSS, Bash, MATLAB, LaTeX

- **Tools:** Adobe Illustrator, SciDavis, Origin.

## HOBBIES

- Painting, Photography 🔍, Reading, Digital Art, Cooking