Manish Gupta

Syracuse, NY | (315) 412 - 8140 | manishgupt12@gmail.com | LinkedIn | Google Scholar | GitHub

EDUCATION

Syracuse University - College of Engineering & Computer Science, Syracuse, NY — Aug 2016 - Jun 2021
Ph.D., Mechanical & Aerospace Engineering, GPA: **3.94**

Cranfield University - Aerospace Engineering, Cranfield, United Kingdom — Oct 2014 - Sept 2015
M.Sc., Computational Fluid Dynamics, GPA: **4.0**

Indian Institute of Technology Kanpur- Engineering, Kanpur, India — Aug 2007 - May 2011
B.Tech., Mechanical Engineering

RELEVANT COURSEWORK & CERTIFICATIONS

- **Data Science & AI**: Advances in Deep Learning | Machine Learning | Neural Networks and Deep Learning | Structuring Machine Learning Projects | Sequence Models | Improving Deep Neural Networks | Statistical Learning Theory | Databases and SQL for Data Science with Python
- **Computer Programming**: Object-Oriented Design | Parallel Programming & Multi-Threading | Object-Oriented Programming

TECHNICAL SKILLS

- Programming Languages & Tools: C++ | Python | SQL | FORTRAN
- Frameworks: TensorFlow | MATLAB | NumPy | Keras | Scikit-learn
- CFD Softwares: LAMMPS | ANSYS workbench | ABAQUS | COMSOL | CAD | SolidWorks

PROJECTS

Deep Learned Heat Transfer Simulator (Doctoral research project, Dr. Shalabh Maroo) — Jan 2019 – Jun 2021

- Collected data and extracted features from molecular dynamics simulations to create a dataset.
- Performed a comprehensive analysis of **regression** models and **shallow neural network** from scratch to determine the applicability of model and hyperparameters.
- Developing a **deep learning model** to improve accuracy for a complex relationship between input features and output.

Molecular Dynamic Software (Doctoral research project, Dr. Shalabh Maroo) — Aug 2016 - Dec 2018

- Programmed a heat transfer **algorithm** in open-source software, Large-scale Atomic/Molecular Massively Parallel Simulator containing 19 classes representing core functionality with more than 500 classes in **C++.**
- Reinforced software for its robustness and flexibility with the help of **object-oriented programming**.

NoSql Database (Object-Oriented Design, Dr. Jim Fawcett) — Jan 2017 - Apr 2017

- Designed a **key/value** in-memory database in **C++** for big data handling and explored the construction of a non-SQL database.
- Built a **software too**l for code analysis with a template class and type-based dependency analyzer and code publisher.

Copula-based Listen and Spell (CBLS) (Advances in Deep Learning, Dr. Yanzhi Wang) — Jan 2018 - Apr 2018

- Trained Listen, Attend and Spell (**LAS**) model for large vocabulary conversational **speech recognition**.
- Extracted higher-level features from the Listener sub-module and captured statistical dependence between them using **Copula** theory.
- Built a **Copula**-based Listen and Spell (CBLA) model for **speech utterances** deploying heterogeneous transfer learning with two sub-modules: Listener (**BLSTM**) & Speller (**LSTM**) in **Python** using **TensorFlow**.

Neural Machine Translation & Multi-Task Classification (Course Projects, Dr. Wang) — Jan 2018 - Apr 2018

- Built a convolution neural network (**CNN**) classifier including backpropagation and gradient descent on the CIFAR-10 dataset.
- Developed neural machine translation model with Recurrent Neural Network (RNN) for English-German translation

Thermal Management and Nucleation (Doctoral research project, Dr. Shalabh Maroo) — Aug 2016 - Jun 2021

- Fabricated the nano-samples at nano-fabrication lab at Cornell University to study nano-confinement effects in channels.
- Investigated the onset of nucleation and the phase change at nanoscale to provide a comprehensive analysis of physics at nano-confined channels and published three peer-reviewed journals and three under-reviews.

- **Patented** a new thermal management device with passive nano-heat pipes for electronics and power conversion devices capable of high improved cooling in localized heat sources (US patent: US10881034B2)

WORK EXPERIENCE

Research Associate, Indian Institute of Technology – Kanpur, India Jun 2013 - Sept 2014

- Conducted an experimental study on synthetic jet underwater and published two research papers showing boundary layer manipulation for underwater vehicles

Design Engineer, Dar Al-Handasah – Pune, India Jul 2011 - Apr 2013

- Managed three projects on designing heating, ventilation, and air-conditioning system with multidisciplinary engineering teams including Khalifa international stadium for Qatar FIFA World Cup 2022

AWARDS AND HONORS

- NSF Travel Grant: ASME International Conference on Nanochannels, Microchannels, and Minichannels, Cambridge, MA, USA 2017
- First Place for the MAE Advisory Board Award for Graduate Research Poster: Syracuse University, NY, Spring 2019
- Research Excellence Doctoral Funding Fellowship: Syracuse University, NY, Spring 2020
- Secured All India Rank – 712 in IIT-JEE 2007 among 300,000 students

SELECTED PUBLICATIONS

Patents:

- S. C. Maroo, A. Zou, and **M. Gupta**, "Passive Nano-heat Pipes for Cooling and Thermal Management of Electronics and Power Conversion Devices") Pub. No.: US 2019 / 0159368 A1, 2019.

Journal Articles:

- A. Zou **M. Gupta**, and S. C. Maroo, "Transpiration Mechanism in Confined Nanopores", The Journal of Physical Chemistry Letter, vol. 11, Issue 9, pp. 3637 - 3641, 2020.
- **M. Gupta**, A. Zou, and S. C. Maroo, "Onset and Critical Radius of Heterogeneous Bubble Nucleation", Applied Physics Letters, vol. 116, Issue 10, 2020.
- A. Zou **M. Gupta**, and S. C. Maroo, "Origin, Evolution, and Movement of Microlayer in Pool Boiling", The Journal of Physical Chemistry Letter, vol. 9, Issue 14, pp. 3863 - 3869, 2018.

Preprints/Under Preparation:

- **M. Gupta**, A. Zou, and S. C. Maroo, "Experimental study of Nucleation Temperature in Nanochannels.", under preparation.
- **M. Gupta**, and S. C. Maroo, "Effect of Nano-Confinement on Vapor Bubble Formation on smooth surfaces.", under review.
- **M. Gupta**, and S. C. Maroo, "Molecular Dynamics Study of Accommodation Coefficients at Liquid-Vapor Interface.", Under review.

Conference Proceedings, Presentation:

- **M. Gupta**, and S.C. Maroo "Prediction of Heat Transfer in Nano-channels using Neural Networks", ASME Summer Heat Transfer Conference, 2021.
- **M. Gupta**, A. Zou, and S.C. Maroo "A Molecular Dynamics Study of Onset Heterogeneous Bubble on Super-Heated Surface", ASME Summer Heat Transfer Conference, Virtual, 2020.
- **M. Gupta**, and S.C. Maroo "Analysis of Accommodation Coefficients Using Molecular Dynamic", ASME Summer Heat Transfer Conference, Virtual, 2020.
- A. Zou, S.C. Maroo, and **M. Gupta** "Equilibrium Pressure of Liquid Confined in Nanopores Using Molecular Dynamics Simulations", ASME Summer Heat Transfer Conference, Virtual, 2020.
- **M. Gupta**, S.P. Raut, A. Zou, T. Tokumasu, and S. C. Maroo, "Pressure Effects in Thin Water Film by Molecular Dynamics", Proceedings of the Eighteenth International Symposium on Advanced Fluid Information, Sendai, Japan, ICFD 2019.
- **M. Gupta**, A. Zou, T. Tokumasu, and S. C. Maroo, "Thermodynamic Property Gradients in Near-Surface Water Thin Film", Proceedings of the Eighteenth International Symposium on Advanced Fluid Information, Sendai, Japan, ICFD2018.
- **M. Gupta**, S. Bijalwan, A. Zou, and S. C. Maroo, "Nanoscale Surface Heat Transfer in LAMMPS: Non-polar Fluid", ASME, ICNMM, Cambridge MA, 2017.
- A. Kumar, **M. Gupta**, and A. K. Saha, "Flow Characteristics of Synthetic Jet on Torpedo Shape Model in Cross Flow", Fluid Mechanics and Fluid Power – Contemporary Research, Lecture Notes in Mechanical Engineering. Springer, New Delhi, 2017.