

MIAD BOODAGHIDIZAJI

☎ 765-775-9777 ✉ miadboodaghi@gmail.com ✉ mboodagh@purdue.edu  [linkedin.com/in/miad-boodaghi-023482223](https://www.linkedin.com/in/miad-boodaghi-023482223)
 <https://github.com/mboodagh>

Education

Purdue University

Ph.D. in Mechanical Engineering

Aug. 2019 – present

West Lafayette, IN, U.S.

Sharif University of Technology

M.Sc. in Mechanical Engineering

Sept. 2015 – Jan. 2018

Tehran, Iran

University of Tabriz

B.Sc. in Mechanical Engineering

Sept. 2011 – Sept. 2015

Tabriz, Iran

Selected Projects and Publications

Developing a software to measure the bacterial concentrations based on Raman signals using CNN | *Python*

- Working on a code that accepts the Raman signal as an input from the user through a GUI made by Tkinter in Python then calculates the bacterial concentration using convolutional neural networks with PyTorch

Prediction of the inflammatory bowel disease (IBD) based on the gut microbiome data using CNN | *Python*

- Working on a code that accepts the patients' gut microbiome data in the form of OTUs as an input and predicts the type of IBD using convolutional neural networks with PyTorch

Bayesian estimation of the diffusion coefficient of Rhodamine 6G in different breast cancer spheroids | *Python*

- Used the Bayesian method to solve the inverse problem of determining diffusivity in spherical HER2+ breast tumors using PyMC3
- Made a comparison across diffusivity values for different breast tumors, and no noticeable difference was observed in the diffusivity values in the presence of TG2
- **Publication link:** <https://www.sciencedirect.com/science/article/abs/pii/S0168365921005319>
- **GitHub link:** https://github.com/mboodagh/Bayesian_estimation_of_the_R6G_diffusivity_in_tumor_spheroids

Machine learning study of the effectiveness of face-coverings on the death ratio of COVID-19 | *Python*

- Utilized different machine learning algorithms for the classification of changes in the COVID-19 death ratio
- Utilized the confusion matrix and ROC curves to assess the accuracy of different algorithms and found that methods like Decision Tree, XGBoost and Naive Bayes lead to accuracies as high as 90%
- **Publication link:** <https://www.nature.com/articles/s41598-021-01005-y>
- **GitHub link:** https://github.com/mboodagh/COVID-19_death_ratio_detection_machine_learning

Multi-fidelity modeling to predict the rheological behavior of the fiber suspensions | *Python*

- Wrote a code that utilizes multi-fidelity Gaussian process and neural network to make rheological predictions
- Made a comparison across single-fidelity and multi-fidelity modelings, which led to the conclusion that multi-fidelity neural networks can significantly improve the accuracy of predictions as high as 98 % when the data is of low abundance
- **Publication link:** <https://meetings.aps.org/Meeting/DFD21/Session/A14.2>

Deep learning for the Classification of the ImageNet images | *Python*

- Wrote a code that downloads images for the categories of interest in the ImageNet datasets and uses deep learning to classify the images for cats and dogs with accuracy above 80%
- **GitHub link:** https://github.com/mboodagh/Deep_learning_classification_using_ImageNet_dataset

Deep learning for classification of the COCO images | *Python*

- Wrote a code that downloads images for the categories of interest in COCO datasets and uses PyTorch to classify the images for 10 categories
- Tried different network structures and found that adding paddings and more convolutional layers improves the prediction accuracy
- **GitHub link:** https://github.com/mboodagh/CNN_for_COCO_dataset

Deep learning for object detection in COCO images | *Python*

- Wrote a code that downloads images that contains the categories of interest in COCO datasets and uses PyTorch to detect the objects in images using ResNet structure for boats and cars as objects of interest with accuracies above 80%
- **GitHub link:** https://github.com/mboodagh/Object_detection_ResNet_for_COCO_imageset

Technical Skills

Languages: Python, MATLAB, C, Fortran

Python Libraries: Pandas, NumPy, Matplotlib, Seaborn, PyTorch, Scikit-Learn, SciPy, GPy, Pymc, PIL, Tkinter

Data Analytics: Machine Learning, Deep Learning, GUI, Clustering, Data Visualization, Object-Oriented Programming, Exploratory Data Analysis, Uncertainty Quantification

Engineering: Bayesian Analysis, Inverse Problems, Drug Delivery, Microfluidics, Rheology

Relevant Coursework

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|------------------------------|--------------------------------|---------------------------|
| • Uncertainty Quantification | • A.I. in Thermal Systems | • Advanced Fluid Dynamics |
| • Deep Learning | • Principles of Bioengineering | • Complex Fluids |

Honors and Awards

- Outstanding student award both in the M.Sc. and B.Sc. studies
- Distinguished as the first-ranked student in Thermodynamics and Fluid Mechanics area exams at Purdue University
- Received 2000 \$ fund from Purdue university for publishing a paper in the nature Journal of Scientific Report
- Led the teaching assistants of the thermodynamics at Purdue University as the lead teaching assistant
- Ranked 2nd in major among 39 graduate students of the class of 2015, Sharif University of Technology
- Ranked 3rd in major among 107 undergraduate students of the class of 2011, University of Tabriz

Languages

- English
- Persian
- Azeri
- Turkish