Yunfei Luo
Ph.D. Student in the Halıcıoğlu Data Science Institute at the University of California San Diego

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📍 San Diego, CA

Yunfei's research focuses on applied machine learning in the field of ubiquitous health, modeling with multimodal data including wearable sensing signal electronic health records. He aim to develop robust and well generalized methodology that could enhance the intelligent monitoring, intervention, and be able to be deployed on edge devices.

🎓 Education

09.2023 - present   **Ph.D. Student in the Halıcıoğlu Data Science Institute**
University of California, San Diego, CA
> Advisor : ⧉ Tauhidur Rahman
> Research : Applied Machine Learning, Multimodal Learning, Multitask Learning, Digital Health

09.2021 - 05.2023
GPA : 3.92/4.0   **Master of Science in Computer Science**
University of Massachusetts Amherst, Amherst, MA
> Advisor : Ina Fiterau Brostean | ⧉ Information Fusion Lab
> Courses Taken : Advanced Machine Learning, Neural Networks, Probabilistic Graphical Models, Reinforcement Learning, Advanced Natural Language Processing, Advanced IoT

09.2017 - 05.2021
GPA : 3.84/4.0   **Bachelor of Science in Computer Science | Bachelor of Science in Mathematics**
University of Massachusetts Amherst, Amherst, MA
> Machine Learning and Computing Specializations

✺ Fellowships, Scholarships, Awards, and Honors

2021 - 2023   Bay State Fellowship | Full Tuition Scholarship

2017 - 2021   Outstanding Undergraduate Course Assistant Award
Chancellor's Award, UMass Amherst

⚗ Publications

Ongoing
Preparing   Real Time Intradialytic Hypotension Forecasting Leveraging Modern Deep Learning Method with Fusion of Physiological Data and Electronic Health Record, TBD, Journal
Yunfei Luo, Siwei Zhao, Rakesh Malhotra, Tauhidur Rahman, Subhasis Dasgupta
> Novel multimodal modeling on physiological data, dialysis machine parameter, and electronic health records. Aiming to accurately forecasting hypotension 1 hour ahead in dialysis patient, and to provide comprehensive insights to nurse for intervention recommendation.

`Signal Processing` `Nephrology` `Clinical Treatment` `Machine Learning` `Multimodal Fusion` `Ubiquitous Health`

Ongoing
Preparing   A Non-Linear Dynamic Analysis and Semantic Inference Approach to Opioid Misuse Risk Assessment from Physiological Signal and Electronic Health Record, TBD, Journal
Yunfei Luo, Katrin Haensel, Mark Tuomenoksa, Eric Garland, Tauhidur Rahman
> Leveraging topological features from trajectory of inferential affective states across days and natural language processing technique to predict the risk of having opioid misuse behavior.

`Signal Processing` `Opioid` `Clinical Treatment` `Machine Learning` `Multimodal Fusion` `Ubiquitous Health`

2024
Under Review   Personalized Affective State Modeling of Opioid Users using Dynamic Branching-based Hierarchical Deep Learning with Wearable Data, IJICAI, Conference
Yunfei Luo, Iman Deznabi, Bhanu Gullapalli, Mark Tuomenoksa, Eric Garland, Madalina Fiterau, Tauhidur Rahman
> Leveraging transformer based time series model and dynamic branching to predict the stress, pain, and craving of Opioid users based on heart beat data collected from wearable sensor.

`Signal Processing` `Heart Rate Variability` `Affective States` `Machine Learning` `Neural Networks` `Ubitquitous Health`

2024	**Dynamic Clustering via Branched Deep Learning Enhances Personalization of Stress Prediction from Mobile Sensor Data, Nature Scientific Report, Journal**
Accepted	Yunfei Luo, Iman Deznabi, Abhinav Shaw, Tauhidur Rahman, and Madalina Fiterau Brostean

> Proposed a novel approach to modeling the Multimodal data, got results that outperform SOTA
> Modeled personalized and populational characteristics with Multitask Learning and Dynamic Clustering Method respectively
> Evaluated the performance under cold-start setting, to support the robustness of our method

Multi-modal | Fusion Methods | Mental Health | Machine Learning | Neural Networks | Time Series

2024	**Multitasking with Progressive Difficulty Subtasks : Enhancing Performance in Natural Language Processing Tasks, NAACL Student Research Workshop, Workshop**
Under Review	Yunfei Luo, Yuyang Liu, Rukai Cai

> Introducing sub-tasks with progressive difficulties to improve the performance on main task. Inspired by how people learn. Experimented on text classification, sentiment analysis, and argument mining

Natural Language Processing | Multi-task Learning | Machine Learning | Neural Networks

2023	**Agent Performing Autonomous Stock Trading under Good and Bad Situations, AI for Agent-Based Modelling (AI4ABM) in International Conference on Learning Representations (ICLR), Workshop**
Accepted	Yunfei Luo, Zhangqi Duan

> Researched and experimented with different reinforcement learning algorithms to train agents to perform stock trading. The methods are evaluated under scenarios with stable and non-stable market

Natural Language Processing | Multi-task Learning | Machine Learning | Neural Networks

💼 Professional Experience

Summer 2022 to 06.2023	**Machine Learning Engineering Intern , Center for Data Science, UMass Amherst**

> Developed platform for Building Segmentation and Damage Assessment based on Satellite Imagery
> Integrated the Machine Learning pipeline along with User Interface for Imagery Fetching and Labelling
> Conducted Research and Experiments with various Finetuning setting and Machine Learning techniques to support selections of final-deployed hyper-parameters and models
> Worked as Research Assistant after internship

Computer Vision | Machine Learning | Disaster Response | Software Development | Full-Stack Development

Summer 2020 to 06.2021	**Data Engineering Intern , Institute for Applied Life Sciences, UMass Amherst**

> Built pipelines for fMRI data preprocessing and statistical analysis
> Conducted Research and Experiments with Machine Learning models for Stroke Detection : Autoencoders, CNNs, and GANs
> Worked as Undergraduate Research Assistant after internship

Machine Learning | fMRI | Data Preparation

📖 Teaching Experience

Fall 2021 to Spring 2023	**Graduate Teachinge Assistant, CICS, UMass Amherst**

> CS 311 Introduction to Algorithm in Fall 2021 and Spring 2023
> CS 590OP Applied Numerical Optimization, and CS 108 Foundation of Data Science in Fall 2022
> CS 220 Programming Methodology in Spring 2022
> Held office hours, led weekly discussion sessions, graded course works, answered questions on course forum, attended weekly TA meeting for discussing the progress/improvements of the course

Javascript | Algorithms | Numerical Optimization | Data Science | Teaching

Spring 2020 to Spring 2021	**Undergraduate Course Assistant, CICS, UMass Amherst**
	› CS 240 Reasoning under Uncertainty in Spring 2021, CS 311 Introduction to Algorithms in Fall 2020, CS 220 Programming Methodology in Spring 2020
	› Helped with weekly discussion session, graded course works, and answered questions on Piazza

Javascript Algorithms Probability Teaching

📖 Professional Certifications

2022	IBM Artificial Intelligence Engineering Professional Certificate
2022	Neuroscience and Neuroimaging Specialization Certificate
2020	TensorFlow Developer Professional Certificate

📖 References

Tauhidur Rahman
Assistant Professor of Computer Science
University of California San Diego
Co-Director of MOSAIC Lab
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Madalina Fiterau Brostean
Assistant Professor of Computer Science
University of Massachusetts Amherst
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