Mohsen Nayebi Kerdabadi

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EDUCATION

Ph.D. in Computer Science **Jan. 2022 - Present**
The University of Kansas (KU), Kansas, US

M.Sc. in Computer Science **Jan. 2022 - May 2024**
The University of Kansas (KU), Kansas, US; CGPA: 4/4

B.Sc. in Mechanical Engineering **Sep. 2016 - Mar. 2021**
Isfahan University of Technology (IUT), Isfahan, Iran; CGPA: 3.82/4

SKILLS AND INTERESTS

ML Domain: Natural Language Processing, Health Informatics, Time Series Analysis, Computer Vision, Survival Analysis.
AI/ML skills: Deep Learning (CNNs, RNNs, LSTM, Transformers), Generative AI (GANs, Autoencoders), Explainable AI, Recommendation Systems, Large Language Models (LLMs), Adversarial Attack, Data Visualization, Data Analytics
Programming: Python, SQL, Matlab.
Libraries : Pytorch, Tensorflow/Keras, Scikit-learn, Pandas, Numpy, Scipy, Matplotlib, Plotly, Seaborn, SNS, Git.

EXPERIENCES

Graduate Research Assistant (Data mining lab, KU) **Jan 2022 - Present**

- Developed advanced deep learning architectures leveraging Transformers, Recurrent Neural Networks, Attention-based Sequential Models, Graph-based Networks, and Generative Models, to address healthcare challenges such as survival analysis, early diagnosis, medical representation learning, model explainability, prescription recommendation system, etc.
- Developed novel adversarial attacks and counterfactual perturbations to elucidate the decision-making of neural networks.
- Hands-on experience in handling and manipulating large-scale datasets, e.g. real-world EHRs datasets, demonstrating proficiency in dataset management and preprocessing.

Graduate Teaching Assistant (ME department, KU) **Jan 2022 - Jan 2023**

- Course: System Dynamics and Control Systems (ME 682), fall 2022,
- Course: System Dynamics and Control Systems (ME 682), fall 2022, *video*
- Course: Mechanical Engineering Measurements and Experimentation (ME 455), Spring 2022, *video*

PUBLICATIONS

• **Mohsen Nayebi Kerdabadi**, Arya Hadizadeh Moghaddam, Bin Liu, Mei Liu, Zijun Yao, Contrastive Learning of Temporal Distinctiveness for Survival Analysis in Electronic Health Records," CIKM'23 | *Paper*

• **Mohsen Nayebi Kerdabadi**, Bin Liu, Mei Liu, Zijun Yao, SurvAttack: Black-Box Attack On Survival Models through Ontology-Informed EHR Perturbation," KDD'24 | Submitted

• Arya Hadizadeh Moghaddam, **Mohsen Nayebi Kerdabadi**, Bin Liu, Mei Liu, Zijun Yao, Contrastive Learning on Medical Intents for Sequential Prescription Recommendation," CIKM'24 | Accepted

• Arya Hadizadeh Moghaddam, **Mohsen Nayebi Kerdabadi**, Bin Liu, Mei Liu, Zijun Yao, Discovering Time-Aware Dependency in Electronic Health Records through Personalized Hidden Graph Inference," KDD'24 | Submitted

• Jinxiang Hu, **Mohsen Nayebi Kerdabadi**, Joseph Cappeller, Richard Barohn, Zijun Yao, Recurrent Neural Networks and Attention Score for Personalized Prediction and Interpretation of Patient-Reported Outcomes," The Journal of Biopharmaceutical Statistics 2024 | Submitted

• **Mohsen Nayebi Kerdabadi**, Arya Hadizadeh Moghaddam, Zijun Yao, Forecasting Subjectively Observed Patient Reported Outcomes via Transformer-guided Soft Clustering-based Multi-task Learning," AMIA'24 | Submitted

• Arya Hadizadeh Moghaddam, **Mohsen Nayebi Kerdabadi**, Zijun Yao, Meta-Learning on Augmented Gene Expression Profiles for Enhanced Lung Cancer Detection," AMIA'24 | Accepted

AWARDS

College of Engineering scholarship award, The University of Kansas, Lawrence, KS **2022**

Summer research scholarship award, ME Department, The University of Kansas, Lawrence, KS **2022**

Ranked 1st in the graduating class of 2020-2021 academic year, Isfahan University of Technology, Iran **2021**

Received National Undergraduate Full Scholarship, Iran **2016,2021**

PROJECTS

LLM-informed Ontology-aware Healthcare Representation Learning **20234**
Graph-based attention model leverages Large Language Models to inject knowledge in health representation learning.

Contrastive Ontology-aware Healthcare Representation Learning **2023**
Graph-based attention model meets contrastive learning to incorporate domain knowledge in representation learning.

Neural Program Synthesis-TransFill **2023**
A transformer-based network is trained on input/output examples and learns to generate a program for string transformations.

Image Captioning **2023**
Generating textual descriptions of images using a CNN-based encoder (ResNet50) and an attention-based LSTM decoder.

Image Generation using GAN **2022**
Using GANs for data augmentation and image-to-image translation (Pix2Pix, CycleGAN).

Write Shakespeare! **2022**
Developed an LSTM-based NLP model trained on Shakespearean writings for generating text in Shakespearean style.

Dynamic Analysis of Cellular Lattice Structures (B.S. Thesis) **2020**
Dynamic Analysis of Cellular Structures under high strain rate using Finite Element Analysis (Abaqus) and Machine learning.

Special Courses and Certifications

AI courses @ KU: Data Science (4/4), Machine Learning (4/4), Bioinformatics (4/4), Inference and Learning (4/4), Computer Vision (4/4), Program Synthesis (4/4)

Specialization Certificate: Generative Adversarial Networks (GANs) Specialization (Coursera)

* *Certificate 1* : Build Basic Generative Adversarial Networks (GANs)
* *Certificate 2* : Build Better Generative Adversarial Networks (GANs)
* *Certificate 3* : Apply Generative Adversarial Networks (GANs)

Specialization Certificate: Deep Learning Specialization (Coursera)

* *Certificate 1* : Neural Networks and Deep Learning
* *Certificate 2* : Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
* *Certificate 3* : Structuring Machine Learning Project
* *Certificate 4* : Convolutional Neural Networks
* *Certificate 5* : Sequence Models

Professional Certificate: TensorFlow Developer Professional Certificate (Coursera)

* *Certificate 1* : Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning
* *Certificate 2* : Convolutional Neural Networks in TensorFlow
* *Certificate 3* : Natural Language Processing in TensorFlow
* *Certificate 4* : Sequences, Time Series and Prediction

Specialization Certificate: AI for Medicine Specialization (Coursera)

* *Certificate 1* : AI for Medical Diagnosis
* *Certificate 2* : AI for Medical Prognosis
* *Certificate 3* : AI For Medical Treatment

SPECIAL COURSE CERTIFICATIONS

ML courses @ KU: Data Science (4/4), Machine Learning (4/4), Bioinformatics (4/4), Inference and Learning (4/4)
Coursera: Generative Adversarial Networks Specialization (*Specialization Cert.*, *Course1*, Course2, Course3)
Coursera: Deep Learning Specialization (*Specialization Cert.*, *Course1*, *Course2*, *Course3*, *Course4*, *Course5*)
Coursera: TensorFlow Developer Professional Certificate (*Professional Cert.*, *Course1*, *Course2* , *Course3*, *Course4*)
Coursera: AI for Medicine Specialization (*Specialization Cert.*, *Course1*, *Course2*, *Course3*)