




Hani Alomari

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Summary

I am a motivated researcher with experience in deep learning, computer vision, and large language models. My work focuses on improving model performance by enhancing semantic diversity and developing more effective retrieval and classification methods. I have contributed to projects involving multimodal learning, dataset creation, and medical AI applications. I am always eager to explore new ideas and apply my skills to solve real-world problems. Looking for an opportunity where I can contribute to AI and deep learning research in an engineering or research role.

EDUCATION

Virginia Tech

PhD, Computer Science

Jan 2023 - Jan 2028

Blacksburg, VA

- **GPA:** 4.00/4.00
- **Coursework:** Research Meth in CS, Advanced Machine Learning, Fundamentals of Info Security, Learning-based Computer Vision, Multimodal Vision

Jordan University of Science and Technology (JUST)

M.S., Data Science

Jan 2020 - Jun 2022

Irbid, Jordan

- **GPA:** 4.26/4.30
- **Achievements:** Awarded a full scholarship to pursue a Master's degree for outstanding academic performance.
- **Coursework:** Data Science Essentials, Statistics for Data science, Big Data Management, Data Analytics, Deep Learning, Data Exploration and Visualization, Computational linguistics, Data - Driven Security

Jordan University of Science and Technology (JUST)

B.S., Computer Science

Jan 2016 - Jan 2020

Irbid, Jordan

- **GPA:** 4.04/4.20
- **Achievements:** Achieved the top rank in the graduating class (62 students), earning recognition on the Honors List.

PUBLICATIONS

- Hani Al-Omari, Rehab Duwairi. So2al-wa-Gwab: A New Arabic Question-Answering Dataset Trained on Answer Extraction Models. *So2al-wa-Gwab: A New Arabic Question-Answering Dataset Trained on Answer Extraction Models. TALLIP, ACM.*
- Hani Al-Omari, et al.. Maximal Matching Matters: Preventing Representation Collapse for Robust Cross-Modal Retrieval. *Maximal Matching Matters: Preventing Representation Collapse for Robust Cross-Modal Retrieval. Manuscript Under Review at CVPR 2025.*
- Zhecan Wang, Junzhang Liu, Chia-Wei Tang, Hani Al-Omari, et al.. JourneyBench: A Challenging One-Stop Vision-Language Understanding Benchmark of Generated Images. *JourneyBench: A Challenging One-Stop Vision-Language Understanding Benchmark of Generated Images. NeurIPS. 2024.*
- Hammad Ayyubi, Junzhang Liu, Zhecan Wang, Hani Al-Omari, et al.. ENTER: Event Based Interpretable Reasoning for VideoQIA. *ENTER: Event Based Interpretable Reasoning for VideoQIA. NeurIPS 2024 MAR Workshop - Spotlight -*
- Hani Al-Omari, Rehab Duwairi, et al.. DLJUST at SemEval-2021 Task 7: Hahackathon - Linking Humor and Offense. *DLJUST at SemEval-2021 Task 7: Hahackathon - Linking Humor and Offense. SemEval-2021 workshop.*
- Hani Al-Omari, Malak Abdullah, Samira Shaikh. EmoDet2: Emotion Detection in English Textual Dialogue Using BERT and BiLSTM Models. *EmoDet2: Emotion Detection in English Textual Dialogue Using BERT and BiLSTM Models. ICICS 2020, IEEE.*
- Hani Al-Omari, Malak Abdullah, Ola Alltiti, Samira Shaikh. JUSTDeep at NLP4IF 2019 Task 1: Propaganda Detection Using Ensemble Deep Learning Models. *JUSTDeep at NLP4IF 2019 Task 1: Propaganda Detection Using Ensemble Deep Learning Models. NLP4IF 2019 workshop.*
- Ayat Abedalla, Ali Fadel, Ibraheem Tuffaha, Hani Al-Omari, Mohammad Omari, Malak Abdullah, Mahmoud Al-Ayyoub. MTREC-SDL: Multi-Modal Transport Recommender System Using Deep Learning and Tree Models. *MTREC-SDL: Multi-Modal Transport Recommender System Using Deep Learning and Tree Models. SNAMS 2019 IEEE.*
- Hani Al-Omari, Malak Abdullah, Bassam Nabeel. EmoDet at SemEval-2019 Task 3: Emotion Detection in Text Using Deep Learning. *EmoDet at SemEval-2019 Task 3: Emotion Detection in Text Using Deep Learning. SemEval-2019 workshop.*

Work Experience

Virginia Tech

Multimodal Representation Learning - Graduate Research Assistant

Jan 2023 - Present

Blacksburg, VA

- Developed novel Maximal Pair Assignment Similarity function with specialized loss functions to prevent set collapse and enhance semantic diversity, achieving state-of-the-art results (6.9% RSUM improvement).
- Contributed to the design and implementation of deep learning architectures for NLP and Vision-LLM projects, drawing on expertise with large language models and generative AI.
- Led the development of a dataset using Vision-LLM to generate dynamic, multi-perspective image descriptions, addressing MS-COCO limitations through automated caption generation.

- Supported JourneyBench development by annotating datasets and conducted comprehensive benchmarking of cross-modal retrieval models, which enhanced the accuracy of the new dataset
- Contributed to hospital medical image classification projects by implementing advanced deep learning architectures, which improved diagnostic accuracy and efficiency

Virginia Tech

Feb 2023 - Present

Graduate Teaching Assistant

Blacksburg, VA

- Assisted in teaching advanced and introductory computer science courses, including Advanced Machine Learning (CS-5824), Introduction to Programming in Python (CS-1064), and AI Tools in Software Development (CS-5914), leading to improved student understanding and performance
- Designed and graded assignments, labs, and exams while mentoring students during office hours and lab sessions, resulting in higher student satisfaction and improved academic performance
- Integrated modern teaching methods, such as virtual labs and coding platforms, to enhance engagement and learning outcomes, which increased student participation and comprehension

Jordan University of Science and Technology

Feb 2020 - Jan 2022

Arabic-NLP - Graduate Research Assistant

Irbid, Jordan

- Designed and implemented machine learning and deep learning models, including transformer-based architectures for NLP and computer vision tasks.
- Conducted statistical analysis and preprocessing for large datasets, contributing to academic publications and conference presentations.
- Supported research objectives by creating surveys, designing questionnaires, and compiling information from various sources.

Jordan University of Science and Technology

Feb 2020 - Jan 2022

Graduate Teaching Assistant

Irbid, Jordan

- Delivered lectures, conducted labs, and supported students in courses such as Introduction to Web Design, Deep Learning, and Computational Linguistics.
- Supervised and mentored students, helping them improve their understanding of programming, algorithms, and data structures.
- Evaluated student performance through assignments, projects, and exams, providing detailed feedback.

Jordan University of Science and Technology

Jun 2019 - Sep 2019

Sentiment Analysis NLP - Research Assistant Internship

Irbid, Jordan

- Participated in competitive research projects such as NLP4IF 2019, focusing on deep learning for NLP, which contributed to advancing project goals and enhancing team collaboration
- Developed and optimized architectures using tools like Keras and PyTorch, debugging and resolving issues to improve model performance, resulting in more accurate and efficient NLP models

PROJECTS EXPERIENCE

Virginia Tech

Blacksburg, VA

Medical Image Classification for Hospital Applications

May 2024 - Aug 2024

- Collaborated on projects utilizing state-of-the-art deep learning models for various medical tasks, including medical instruments classification and anomaly detection.
- Enhanced accuracy and reliability of medical image classification systems through model fine-tuning and optimization.

Virginia Tech

Irbid, Jordan

So2al-wa-Gwab: Arabic Question Answering System

Feb 2020 - Jun 2022

- Created a novel Arabic QA dataset and benchmark, addressing key limitations in existing datasets including translation errors and context size.
- Implemented and evaluated multiple deep learning architectures (BERT, BiDAF, QANet) across 7 Arabic QA datasets.
- Demonstrated performance improvement using human-annotated data versus machine translation approaches.

Jordan University of Science and Technology

Irbid, Jordan

EmoDet: Emotion Detection in Text

Feb 2019 - Jan 2020

- Developed a deep learning-based emotion detection system that combine different features from different sources, such as psycholinguistic features, pretrained word embedding features.
- Archived 16% improvement in F1-score compared to baseline models.

Jordan University of Science and Technology

Irbid, Jordan

Step Tracker Android Application

Mar 2019 - May 2019

- Developed a step-tracking Android app using phone sensors, featuring real-time step counting and caloric tracking.
- Implemented data visualization with calendar integration for activity trend analysis.
- Integrated Firebase backend for secure user data storage and authentication.

SKILLS

- **Programming Languages:** Python, C++, Java, Bash
- **Machine Learning & AI:** PyTorch, TensorFlow, Keras, Scikit-learn, Transformers, Question Answering, Large Language Models, Deep Learning, Neural Networks, Multimodal Representation Learning
- **Data Processing:** Pandas, NumPy, NLTK, SpaCy, OpenCV, Matlab
- **Development Tools:** Docker, MySQL, Git