Nahid Zeinali

Department of Computer Science & Informatics, University of Iowa
https://github.com/Nahidzeinali-web
Linkedin.com/in/nahid-zeinali
https://orcid.org/0009-0009-1546-9972

I am a dynamic professional with 8+ years of experience using data science and engineering methodologies to deliver tangible insights and enhance healthcare system outcomes. My research is focused on advancing AI techniques and using data-driven approaches to create deep learning algorithms for diverse clinical applications.

Core Competencies

Programming Skills	Machine Learning and Deep Learning Methods	Cross-Functional Partnership
Large-Scale Data Analysis	Generative Models and NLP	Communication Skills
Predictive Modeling	Large Language Models (LLM) Development	Environment Adaptability
Data Validation & Modeling	OpenAI	Organizational Skills
Visualization Techniques	Prompt Engineering	Teamwork and Independent Work
Text-Based Data Analysis	Recommender Systems	Problem-Solving Skills

Education

Ph.D., Informatics, University of Iowa, Iowa City, IA **2022-2025**
M.S, Informatics, University of Iowa, Iowa City, IA **2021-2022**
M.S, Medical Informatics, Tarbiat Modares University, Tehran **2013-2016**
B.S, Computer Software Engineering, Isfahan University, Isfahan **2005-2010**

Professional Experience

Teacher Assistant, Computer Science, University of Iowa ***Fall 2024***
Internship, National Cancer Center, Federick National Laboratory, NIH ***Summer 2024***

- Conducted a comprehensive literature review and utilized advanced language models (e.g., LLaMA3) to identify Variant-Genotype-Phenotype associations from specialized biomedical publications.
- Managed data curation and model fine-tuning within the Frederick Research Computing Environment, ensuring accuracy in phenotype-variant data extraction.
- Delivered a detailed project report and presented findings at an NIH, demonstrating critical insights into disease associations using language models.

Research Assistant, Computer Science and Informatics Department, University of Iowa ***Fall 2021-Present***

Data Analysis & Statistical Modeling:

- Analyzed Electronic Health Records using Python and statistical methods, yielding fundamental insights that enhanced medical research and patient care.
- Identified predictors of symptom reporting agreement between patients and providers using deep learning and statistical techniques.

Natural Language Processing (NLP) & Large Language Model (LLM):

- Collaborated closely with the research teams to develop an embeddings-augmented NLP system.
- Understanding the language in clinical notes in the electronic health records (EHR) system using NLP techniques and text analysis.
- Pre-training and Fine-tuning large language models (BERT, GPT, and LLama) on customized EHRs to predict 13 cancer symptoms and Palliative care.
- Utilizing OpenAI's GPT-4 and GPT-3.5 for prompt engineering in healthcare natural language processing tasks, such as named entity recognition (NER) and multiclass classification.
- Employed OpenAI's GPT-4 to generate synthetic clinical notes, enhancing the simulation of real-world medical documentation.

Mobile Application Development with AI Techniques:

- Contributed to developing the OASIS (Oncology Associated Symptoms & Individualized Strategies) mobile app, a tool designed to help people with cancer.
- Collaborated with colleagues to develop deep-learning algorithms for the app's recommendation system, predicting 14 cancer symptoms in over 18,000 patients.
- Assisted in A/B testing the OASIS prototype on 100 patients, assessing its real-world efficacy and user experience.

Other Project:

- Collaborated with a team to extract web article content, develop a sentiment classifier, and perform cluster and topic analysis to identify prevalent themes.

- Worked with a team to leverage Python-based tools and algorithms to enhance and innovate demand forecasting methodologies.
- Developed a heart disease classification AI system using traditional machine learning models.

Software Engineer, Khorshid Hospital, Isfahan ***2019 – 2021***

- Collaborated closely with the business teams to develop Electronic Medical Records (EMR), Pharmacy Information Systems (PIS), and Laboratory Information Systems (LIS). This collaboration resulted in streamlined healthcare workflows, enhanced data management, and improved patient care delivery by more than 50%.
- Developed an Android application for the automated tracking of heart failure symptoms of over 3,000 heart disease patients in rural areas of Isfahan province.

Software Engineer, Parisian Institute, Tehran ***2016 – 2019***

- Designed and implemented an efficient Electronic Health Records (EHR) management dashboard system using Business Intelligence techniques to reduce the report response time by more than 68%.
- Trained and mentored 1500+ clinicians and healthcare providers using electronic health records and dashboards, contributing to organizational growth and success.

Technical Proficiencies

Programming & Frameworks: Python, MATLAB, C/C++/C#, ASP.net, Android, JavaScript, HTML, XML
Data Analysis: Pandas, NumPy
Machine Learning and Deep Learning: Frameworks (like: TensorFlow, pytorch, sklearn, keras)
NLP & LLM: NLTK, Spacy, BERT, GPT, LLaMa, OpenAI, LangChain
Cloud Platforms: Google Cloud, HPC cluster
Databases: MS SQL Server, MS Access,
Statistics Tools: R, SPSS, SAS, STATA
Visualization: Power BI
Networking: TCP/IP, VLAN, router & switch configuration
Operating Systems & Tools: Windows, Linux, Azure, VMware, Active Directory, server clustering

Presentation

- **N. Zeinali (Presenter)**, Stephanie Gilbertson-White, et al. "Evaluation of BERT Variebts for identifying cancer symptoms from Clinical Notes." *Holden Comprehensive Cancer Center Scientific Retreat, Iowa, 2024.*
- **N. Zeinali (Presenter)**, A. AlBashayreh, et al. "Comparison of BERT Implementations for Enhanced Cancer Symptoms Extraction from Electronic Health Records." *2024 IEEE First International Conference on Artificial Intelligence for Medicine, Health and Care (AIMHC), Laguna Hills, CA, USA, 2024, pp. 18-19, doi: 10.1109/AIMHC59811.2024.00011.*
- **N.Zeinali (Presenter),** Stephanie Gilbertson-White, et al. "Advanced Detection of Nausea/Vomiting and Anxiety in Patients with Cancer." *AMIA 2024 Annual Symposium.*
- A. AlBashayreh (Presenter), **N.Zeinali,** et al. **"**Leveraging Spiritual-BERT for Characterizing Spiritual Care Documentation in EHRs of Older Adults with Heart Failure**."** *AMIA 2024 Annual Symposium*

Publications

- **N. Zeinali**, Stephanie Gilbertson-White et al. "Machine Learning Approaches to predict symptoms in people with cancer: A Systematic Review." *JMIR cancer,2024. doi: 10.2196/52322.*
- **N. Zeinali***,* S. White, et al. *"*Symptom-BERT: Enhancing Cancer Symptom Detection in EHR Clinical Notes*." Journal of pain and symptom management (2024).*
- A. AlBashayreh, **N. Zeinali**, et al. "Natural Language Processing Accurately Differentiates Cancer Symptom Information in EHR Narratives." *JCO clinical cancer Informatics,2024.*
- S.G. White, **N. Zeinali,** et al., "Special Section on Patient-Reported Outcomes and Informatics: Predictors of Concordance Between Patient-Reported and Provider-Documented Symptoms in the Context of Cancer and Multimorbidity." *ACI,2024*
- A. Bandyopadhyay, **N. Zeinali,** et al. **"**Using real-world EHR data to predict the development of 12 cancer-related symptoms in multimorbidity. Predictive". *Open JAMIA*, 2024.
- **N.Zeinali,** A. AlBashayreh, et al. "Comparing Fine-Tuning Strategies and Prompt Engineering in Large Language Models for Identifying Anxiety and Nausea in Patients with Cancer from Clinical Notes." *Prepare for publication, 2024.*

- A. AlBashayreh, **N. Zeinali**, et al. "*Leveraging Spiritual-BERT for Characterizing Spiritual Care Documentation in EHRs of Older Adults." Preparation for Journal, 2024.*
- Nazari E, **Zeinali N**, et al. "Application of Big Data Analysis in Healthcare Based on 6 Building Blocks of Health Systems: Survey". *Dokkyo Journal of Medical Sciences (DJMS) 2020.*
- **N. Zeinali**, A. Asosheh, et al. "Provide interoperability model to interact in hospital information systems." *Journal of Health and Biomedical Informatics, 2017.*
- **N. Zeinali**, A. Asosheh, et al. "The Conceptual Model to Solve Problem of Interoperability in Health Information Systems." 2016 8th International Symposium on Telecommunications (IST)*, 2016, pp. 684-689, doi: 10.1109/ISTEL.2016.7881909.*
- Shah Moradi M, **Zeinali N**, et al. "The common applications of social networks in healthcare." *Journal of Health Information Management (2016): 243-248.*
- Shah Moradi M, **Zeinali N**, et al. "The Role of Social Networks in Healthcare: Applications and Limitations". *Journal of Health and Biomedical Informatics 2015; 2(2):124-128.*

Honors & Awards

Student Impact Grant(1000$), University of Iowa	***Summer 2024***
AMIA 10*10 program funded (2000$) by Carver College of Medicine (CCOM), University of Iowa	***Spring 2024***
Research and Travel GPSG Award (1250 $), University of Iowa	***Spring 2024***
Research Assistant Grant (6000$), College of Nursing, University of Iowa	***Spring 2024***
Publication Grant (2000$), University of Iowa	***Winter2024***
Travel GSS Award (650$), Graduate College, University of Iowa	***Winter2024***
Travel CS Award (400$), Computer Science Department, University of Iowa	***Winter2024***
Recruitment Fellowship, IGPI (Per Year), University of Iowa	***2021- 2024***
Recruitment Fellowship, Tarbiat Modares University	***2013 -2016***