Soroush Piri

Address: Baltimore, MD Email: soroush.piri@morgan.edu Phone: +1 (618) 319-5252   LinkedIn: Soroush Piri
Work Authorization: Eligible to work in the U.S. (Approved EB-2 NIW I-140; I-485 Adjustment of Status Pending - No Sponsorship Required)

TECHNICAL SKILLS

- Programming and Machine Learning Frameworks: Python (pandas, scikit-learn, PyTorch, Hugging Face Transformers), R (tidyverse, caret, Shiny), SQL

- Natural Language Processing: Transformer-based NLP, semantic modeling, domain-specific text analytics, sentiment and perception modeling, information extraction from construction safety and incident reports

- Artificial Intelligence and Machine Learning: Predictive modeling, clustering, PCA, classification, time-series forecasting, representation learning, end-to-end ML system evaluation

- Data Engineering and Pipeline Architecture: Data pipeline development, structured and unstructured data integration, multimodal datasets

- Data Visualization: Power BI, R Shiny, ggplot2

WORK EXPERIENCE

Graduate Researcher - AI and Machine Learning
Aug 2023 - Present

School Of Architecture and Planning, Morgan State University, Baltimore, MD

- Architected a hybrid NLP pipeline combining transformer-based semantic modeling with a multi-state extraction engine to convert unstructured construction fatality reports into structured, research-ready datasets.
- Designed a scalable research framework for extracting, standardizing, and analyzing occupational fatality data, establishing a methodological foundation for AI-driven safety modeling.
- Leveraged embeddings and semantic similarity to consolidate fragmented contributing-factor labels into a standardized taxonomy, enabling large-scale causal analysis in construction accidents.
- Engineered an interactive R Shiny platform integrating OCR, rule-based parsing, and LLM-assisted extraction with validation tooling to support scalable accident-report analysis.
- Applied clustering, PCA, and time-series ML to large-scale infrastructure data, developing robust evaluation metrics that revealed deterioration patterns and informed DOT maintenance strategy.
- Led an end-to-end ML evaluation initiative on safety and crime data, designing scalable frameworks for preprocessing, model performance assessment, and policy insight generation for Maryland state initiatives.
- Built multimodal evaluation dashboards (R Shiny, Power BI, SQL, Python/R integration) to translate complex ML outputs into real-time decision support for policymakers.

Graduate Research Assistant
Aug 2021 - May 2023

Urban Integrity and Intelligence Lab, Southern Illinois University, Carbondale, IL

- Consulted with faculty and external partners on predictive modeling and evaluation design, delivering statistical frameworks and performance metrics that guided multiple ML research projects.
- Built SQL queries and visualization pipelines to generate evaluation dashboards capturing trends, business performance, and model reliability.
- Developed statistical and ML evaluation methods for data collection, quality assurance, and analysis, ensuring reproducible and scalable results.
- Designed and deployed interactive R Shiny applications that implemented end-to-end evaluation workflows from raw data ingestion to cleaning, model assessment, and visualization for end users.
- Educated participants on end-to-end automation frameworks and deployment strategies for open-source data.
- Demonstrated reproducible workflows for multimodal data evaluation (text, tabular, visualizations), enabling researchers to apply frameworks to real-world datasets.

APPLICATIONS AND TOOLS DEVELOPED

[IntegrativeSentiment.io (iS.io)](#)   Aug 2021 - May 2023

A Web-based Interactive Tool for Integrated Human Sentiment Modeling
- Featured and demonstrated IS.io app at SIMAUD 2022 as a novel evaluation framework for analyzing large-scale human feedback through sustainability and sentiment modeling studies.
- Designed and deployed a real-time NLP evaluation platform in R Shiny for analyzing large-scale textual data (Twitter), integrating transformer-based NLP and custom performance metrics.
- Developed an interactive browser-based interface embedding the R engine, enabling scalable evaluation without reliance on RStudio or command-line tools.
- Integrated graph theory and geospatial mapping to create a multimodal evaluation system that assessed sentiment patterns across time and space.
- Applied advanced emotional intelligence and NLP frameworks to generate nuanced evaluation metrics beyond positive/negative sentiment, capturing complexity in human feedback.

EDUCATION

PhD Candidate - Concentration: Data Engineering, Machine Learning and Artificial Intelligence - GPA:3.8   Aug 2023 - May 2027

Morgan State University, Baltimore, MD

Master of Architecture (M.Arch) - GPA:3.61   Aug 2021 - May 2023

Southern Illinois University, Carbondale, IL

Bachelor of Science (BS) In Architecture - GPA:3.52   Sep 2015 - Jan 2020

Tehran Azad University, Tehran, Iran

PUBLICATION

Google Scholor: https://scholar.google.com/citations?user=2G7H_DMAAAAJ&hl=en

HONORS AND AWARDS

[Uncovering Symmetric and Asymmetric Deterioration Patterns in Maryland's Steel Bridges Through Time-Series Clustering and Principal Component Analysis](#)   November 2025

Symmetry Journal - Accepted and Published Paper

[Development of Bridge Deterioration Models Using Machine Learning Methods](#)   August 2025

CIAMTIS – U.S. DOT Region 3 University Transportation Center – Published Project

[Integrating MachineLearning Techniques for Enhanced Safety and Crime Analysis in Maryland](#)   April 2025

Applied Sciences Journal -Novel Applications of Machine Learning and Bayesian Optimization - Accepted and Published Paper

[Unraveling Safety Concerns in Construction: A ComprehensiveData Analysis](#)   May 2024

ASC 2024 International Conference in Alabama - Accepted and Published Paper

[ExploringU.S.Occupant PerceptionTowardIndoor Air Quality Via Social Media and NLPAnalysis](#)   May 2024

Journal of Environmental Scienceand Public Health 2024 - Accepted and Published Paper