MANOJ ADHIKARI

El Sobrante, California (510) 334-8292 manojadk8@gmail.com github.com/jonamadk

Education

M.S., Computer Science, East Tennessee State University, GPA:4.0/4.0 2023 - 2025 |TN, USA
B.S., Computer Science, Tribhuvan University, Percentage: 80.12% (Distinction) 2016 - 2020 |KTM, Nepal

Publications (C = Conference)

[**C1**] **M. Adhikari**, P. Joshi, G. V. Ramos, A. A. Doulat and S. Shaik, "AIDE: Leveraging Retrieval- Augmented Generation for Context-Aware Educational Data Retrieval and Dialogue," 2025 International Conference on Smart Applications, Communications and Networking (SmartNets), Istanbul, Turkiye, 2025, pp. 1-7, doi: 10.1109/SmartNets65254.2025.11106900. view

[**C2**] **M. Adhikari**, P. Joshi, S. Shrestha and S. Shaik, "Vision-Based Driver Drowsiness and Distraction Detection through Behavioral Indicators of Fatigue," SoutheastCon 2025, Concord, NC, USA, 2025, pp. 261-266, doi: 10.1109/SoutheastCon56624.2025.10971515 view

[**C3**] P. Joshi, **M. Adhikari**, S. Shrestha and S. Shaik, "Real-Time Driver Drowsiness Detection Using CNN, MediaPipe, and ML Classifiers," SoutheastCon 2025, Concord, NC, USA, 2025, pp. 589- 594, doi: 10.1109/SoutheastCon56624.2025.10971270 view

[**C4**] C. Young, A. A Doulat, P. Joshi, **M. Adhikari**, and S. Kshatri, "Modeling Student's Emotional Trajectories in Course Evaluations: A Computational Framework for Enhancing Student Success," OTESSA'25, In Press.

Research Experience

Computing Lab of East Tennessee State University Sep 2024 - Present
Project: BucAIDE: Intelligent Q&A platform Advisors: Dr. Shehenaz Shaik, Dr. Ahmad Al Doulat

- Study and design information-retrieval architectures that support robust, context-aware decision-making.
- Developed and evaluated prompt chains and query-rewriting templates, to ensure content safety and preserve contextual fidelity across multi-turn dialogue.
- Improved system correctness to 88% with semantic search, reranking, topic modeling, and coreferencing.
- Performed mixed-methods evaluation: focus-group study and quantitative system benchmarking, to assess usability, reliability, and decision-support effectiveness.

Project: EchoStress: Sensing Stress in Sound Advisor: Dr. Shehenaz Shaik

- Designed an audio–text alignment pipeline using WhisperX to obtain high-fidelity transcriptions with precise word- and phoneme-level timing, enabling reliable downstream prosodic analysis.
- Developed a python package to extract prosodic features and perform robust syllable-level alignment
- Implemented clustering to identify stressed vs. unstressed syllables, evaluating performance across multiple prosodic feature subsets and clustering configurations.

Project: Intelligent Plumbing Info. & Performance Eval. tool Advisor: Dr. Md Rasheduzzaman

- Contributed to modernizing the PIPE framework by transforming a rule-based assessment tool into an intelligent decision-support system for evaluating building-level plumbing risks.
- Designed retrieval- and reasoning-oriented pipelines that incorporate domain constraints, contextual priors, and multi-factor building metadata to improve decision fidelity and reduce hallucination risk.
- Collaborated with environmental health researchers to validate system outputs against established plumbing risk models and real-world case studies.

Fr. Lockie & Stiller Research Program, St. Xavier's College 2018 - 2019
Crime Risk Assessment - Kathmandu Valley Advisor: Lecturer Rajan Karmacharya

- Developed data preprocessing and analytical workflow to examine criminal activity trends and built a structured risk matrix for evaluating threat levels. Created geospatial visualizations to highlight crime-prone areas.

Grants, Awards & Honors (G = Grant, A = Award, H = Honor)

[**G1**] Small Grant in Support – Impactful Capstone, *ETSU* ($700) 2025
[**A1**] Frank and Ginger Hawk Rutherford Scholarship, *ETSU* ($1000) 2024
[**A2**] Fr. Martin P. Coyne, S.J Memorial Award Moral Uprightness, *TU, St. Xavier's College* 2020
[**A3**] Fr. Lockie & Stiller Research Award, *TU, St. Xavier's College* ($550) 2019
[**H1**] Google Crowdsource Appreciation Award,*Google* 2018

Fellowship & Volunteering

IEEEDay Virtual AI Summit, IEEE Day Ambassador, Co-organizer Oct 2025
IEEE Apollo 12 AI & STEM Workshop, USS Hornet Museum, Mentor Nov 2025
Google DevFest Event, Google Dev. Group, Dang, Nepal, Mentor 2018, 2019
Remote Compute Connect Initiatives, St. Xavier's College, Tech Lead 2017

Work Experience

Graduate Teaching Assistant, East Tennessee State University Aug 2023 – May 2025 |TN, USA
- Taught CSCI 1100/1150 (Using Information Technology) in person and led lab sessions for CSCI 1250 (Introduction to Programming).
- Collaborated with the professor to develop course materials on topics of Data, AI, and Cybersecurity literacy.
- Graded assignments and held regular office hours to provide academic support and guidance to students.

Data Analyst-II, Renegade Insurance Feb 2020 – Jul 2023 |Lalitpur, Nepal
- Developed ETL pipelines to warehouse heterogeneous datasets from 16+ U.S insurance carriers, ensuring high data integrity, observability, and readiness for real-time analytics and reporting.
- Conducted in-depth quantitative analysis and KPI tracking across leads, quotes, and policy sales spanning 20+ U.S states, identifying market trends, behavioral patterns, and optimization opportunities using Python.
- Collaborated with data scientists and engineers to design and deliver data solutions and ad-hoc analytical products for vendor stakeholders, improving operational efficiency and supporting business scalability.

Skills

Technical: Python, C, C++, Java, SQL, NoSQL, Vector Databases, Git, Docker, Apache Airflow, TensorFlow, Keras, PyTorch, LangChain, LLMs, Transformers, RAG Systems, Knowledge Graphs, Neural IR, Embeddings, Transfer Learning, Multimodal Learning, Data Preprocessing, Model Optimization, Evaluation Benchmarking .

Research: Experimental Design, Statistical Modeling, Quantitative Analysis, Qualitative Methods, Ablation Studies, Error Analysis, User Study Design, Scientific Writing, Reproducible Research.

Professional Organization

IEEE Computer Society, Young Professional, Intelligent Informatics Member

References (R = Relationship)

Dr. Shehenaz Shaik
Assistant Professor, East Tennessee State University, `shaiks@etsu.edu` [R]: Research Supervisor
Dr. Chelsea Dubay
Assistant Professor, East Tennessee State University, `dubayc@etsu.edu` [R]: TA Supervisor
Dr. Jeff Roach
Associate Professor, East Tennessee State University, `roachj@etsu.edu` [R]: Course Instructor

Human Subjects Research Certifications

- Students in Research, Citi — Link
- Socio-Behavioral-Educational Researchers, Citi — Link

Selected Projects — GitHub

Interakt — Tools: Python, Streamlit, YOLOv8, MediaPipe

- Designed and implemented a real-time daily activity tracking and behavioral analytics system integrating YOLOv8 for object detection and MediaPipe for human-pose estimation.
- Developed a continuous webcam-based monitoring pipeline to detect user interactions with everyday objects, generating structured, time-stamped activity logs for downstream analysis.
- Built data-parsing modules to extract temporal patterns, interaction frequencies, and contextual cues from activity sequences.
- Conducted statistical and exploratory analyses to derive behavioral insights such as distraction indicators, multi-tasking patterns, and intentional vs. unintentional user engagement.
- Evaluated system performance under varying lighting and motion conditions and optimized object detection thresholds to improve reliability and reduce false positives.

Credit Risk Modeling and Model Risk Validation — Tools: Python, Scikit-learn, Seaborn, Matplotlib

- Engineered an end-to-end credit risk modeling framework using the Freddie Mac Single-Family Loan dataset to predict mortgage default risk and support CECL-compliant lifetime PD estimation.
- Performed rigorous data quality checks, missing value diagnostics, and feature selection using Information Value (IV) to identify predictive drivers of credit risk.
- Developed benchmark risk models including Logistic Regression, XGBoost, and Cox Proportional Hazards, comparing model performance across discriminatory power, calibration error, and stability metrics.
- Conducted OOS (Out-of-Sample), OOT (Out-of-Time), and OOU (Out-of-Universe) validations to assess model robustness and generalization under temporal, demographic, and market variations.
- Implemented CCAR-style macroeconomic stress testing to analyze model sensitivity to adverse economic conditions and ensure regulatory-aligned model resilience.
- Documented model development processes and reproducibility pipelines to support Model Risk Management (MRM) best practices.

Phishing Awareness and Simulation System — Tools: Python, Seaborn, Scikit-learn

- Architected backend REST APIs for an intelligent phishing-simulation platform designed to educate users and measure organizational cybersecurity awareness.
- Developed realistic phishing templates with variable difficulty levels and built automated campaign workflows that track browser metadata, open rates, click patterns, and response behavior.
- Designed analytics modules to infer susceptibility profiles by analyzing user cohorts, behavioral triggers, and risk factors based on response patterns.
- Implemented one-pixel tracking for email engagement monitoring and integrated dark-web breach lookup endpoints to provide personalized risk assessments.
- Conducted statistical analysis to identify high-risk user groups and generate targeted training recommendations.