

# Syed Hasan Amin Mahmood

☎ (217) 904-0276 | ✉ hasanamin@purdue.edu | 🌐 shasanamin.github.io | 🌐 shasanamin | 📧 shasanamin

## EDUCATION

---

### Purdue University

*Ph.D. in Computer Science — GPA: 4.0/4.0*

*M.S. in Computer Science — GPA: 4.0/4.0*

*West Lafayette, IN*

*Aug. 21 – Present*

*Aug. 21 – May. 24*

**Research Area:** (Human-Centered) AI, ML & NLP

**Select Courses:** Algorithms, Cognitive Psychology, Computation & Learning on Graphs, Data Mining, Database Systems, Human-AI Interaction, Interpretability in Machine Learning, Natural Language Processing, Probabilistic Causal Inference, Social Psychology, Statistical Machine Learning

### Lahore University of Management Sciences (LUMS)

*B.S. in Electrical Engineering — GPA: 4.0/4.0*

**Minor:** Computer Science

*Lahore, Pakistan*

*Sep. 16 – Jun. 20*

**Select Courses:** Advance Digital Signal Processing (Grad), Advanced Programming, Applied Probability (Grad), Artificial Intelligence, Data Science, Deep Learning, Dynamic Programming & Reinforcement Learning (Grad), Embedded Systems (Grad), Information Theory & Machine Learning (Grad)

## EXPERIENCE

---

### Microsoft

*Data Scientist (PhD) Intern*

Utilize machine learning, statistics, and experimentation to build and improve state-of-the-art technologies.

*Redmond, WA*

*May. 24 – Aug. 24*

### Afiniti

*Data Scientist*

Applied Bayesian statistical modeling and machine learning methods to create human-centered optimizations in customer-agent pairings and channels, driving measurable revenue growth and cost reduction.

*Lahore, Pakistan*

*Oct. 20 – Aug. 21*

### University of Notre Dame

*Research Assistant*

Worked on deep learning, deep generative models in particular, in challenging time series contexts characterized by lack of stationarity, seasonality, completeness etc., with focus on security and health applications.

*Notre Dame, IN*

*Jun. 20 – Oct. 20*

## PUBLICATIONS

---

[Under Review] **H. Amin**, M. Yin, R. Khanna, “On the Support Vector Effect in DNNs: Rethinking Data Selection and Attribution”.

[C3] **H. Amin**, Z. Lu, M. Yin, “Designing Behavior-Aware AI to Improve the Human-AI Team Performance in AI-Assisted Decision Making” in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2024.

[W2] **H. Amin**, R. Khanna, “On the Support Vector Effect in DNNs: Rethinking Last Layer Sensitivity-based Instance Attribution,” in *NeurIPS Workshop on Attributing Model Behavior at Scale*, 2023.

[W1] **H. Amin**, Z. Lu, M. Yin, “Give Weight to Human Reactions: Optimizing Complementary AI in Practical Human-AI Teams,” in *ICML Workshop on AI & HCI*, 2023.

[C2] **S. H. A. Mahmood**, A. Abbasi, “Using Deep Generative Models to Boost Forecasting: A Phishing Prediction Case Study,” in *IEEE International Conference on Data Mining (ICDM) Workshops*, 2020.

[C1] **S. H. A. Mahmood**, S. M. A. Abbasi, A. Abbasi, F. Zaffar, “Phishcasting: Deep Learning for Time Series Forecasting of Phishing Attacks,” in *IEEE International Conference on Intelligence and Security Informatics (ISI)*, 2020.

## PROJECTS

---

### **Designing Behavior-Aware AI to Optimize Human-AI Team Performance** *May. 22 – Present*

- Formulated a novel AI training paradigm to account for humans' behavior in adopting AI advice.
- Derived optimal training strategy under a threshold-based model, and demonstrated efficacy through systematic experimentation on synthetic datasets and randomized experiments with real human subjects.
- Investigating alternate human behavior models and complementary training strategies, with particular focus on personalization and data efficiency.

### **Rethinking Instance Attribution and Data Subset Selection** *May. 22 – Present*

- Introduced Support Vector Effect, illuminating how the last layer(s) of DNNs exhibit SVM-like behavior.
- Explained perplexing shortcomings in prominent instance attribution and data subset selection methods.
- Uncovered fresh limitations and insights, including the vulnerability to basic adversarial attacks.
- Demonstrated how embarrassingly simple proposals can often outperform the purported state-of-the-art.

### **How Large Language Models Are Transforming Database Systems** *Aug. 23 – Dec. 23*

- Investigated how LLMs are, or will, generally influence database (management) systems.
- Analyzed impact of different LLMs, finetuning and in-context learning strategies on text-to-SQL tasks.
- Explored prompt engineering and prompt learning techniques to improve text-to-SQL performance.

### **Analyzing Robustness of NLP Models to (Adversarial) Noises** *Jan. 23 – Apr. 23*

- Conducted a comparative study on robustness of NLP models to varied noises and adversarial attacks.
- Highlighted vulnerabilities of transformer-based models and advantages of non-attention based models.

## HONORS & AWARDS

---

**Summer Research Grant, Purdue University** *2023*

**Graduation with High Distinction, LUMS** *2020*

**Winner, Social Innovation Challenge, LUMS Envision** *2018*

**Full Scholarship for National University of Singapore Summer Enterprise Program** *2017*

## TEACHING APPOINTMENTS

---

**Purdue University** *Fall 2021 – Present*

Data Mining (CS 573), Data Engineering I (CS 50023), Foundations of Decision Making (CS 50025), Data Science Capstone (CS 490), Introduction to Data Science (CS 242 / STAT 242)

**LUMS** *Fall 2018 – Fall 2020*

Advance Digital Signal Processing (EE 511), Engineering Laboratory (EE 100), Feedback Control Systems (EE 361), Circuits II (EE 242), Introduction to Game Theory (ECON 233 / MATH 232)

## SERVICE

---

**Journal Reviewer:** IEEE Intelligent Systems (2020–Present)

**Conference Reviewer:** KDD (2024), IJCAI (2024)

**Workshop Reviewer:** Interpretable Machine Learning in Healthcare @ICML (2022, 2023)

## SKILLS

---

**Proficient in:** Python, R, MATLAB, C/C++, SQL,  $\text{\LaTeX}$ , MS Office

**Experience With:** Haskell, JavaScript, Go, Verilog, Mojo, NoSQL, Google Cloud Platform, AMTurk, C#, Unity, Modelica, User Research, Wireframing, Prototyping

**Languages:** English (Bilingual), Urdu (Bilingual), Punjabi (Beginner), Arabic (Beginner)