Bhiman Kumar Baghel

COMPUTER SCIENCE PHD · UNIVERSITY OF PITTSBURGH

📱 +1-412 844 1085 | ✉ bkb45@pitt.edu | 🏠 https://bhimanbaghel.github.io/ | in linkedin.com/in/bhiman-kumar-baghel | 🎓 Bhiman

Summary

Developing and refining techniques for memory editing in large language models (LLMs), enabling efficient updates to internal knowledge representations for improved adaptability and fairness without the computational cost of full finetuning. Previously, worked on advanced natural language understanding (NLU) tasks for Conversational AI, including multi-intent classification, slot filling, and handling out-of-domain queries.

Education

University Of Pittsburgh   *PA, USA*

Doctor of Philosophy - PhD in Computer Science [3.75/4]   *2023 - 2028 Expected*

Indian Institute of Technology (IIT)   *Kharagpur, India*

Master of Technology - M.Tech. in Computer Science & Engineering [CGPA - 8.82/10]   *2017 - 2019*

National institute Of Technology (NIT)   *Jalandhar, India*

Bachelor of Technology - B.Tech. in Computer Science & Engineering [CGPA - 6.82/10]   *2013 - 2017*

Publications

A Fairness Analysis of Human and AI-Generated Student Reflection Summaries [Link]   *ACL Workshop, 2024*

Multimodal Understanding of Memes with Fair Explanations [Link]   *CVPR Workshop, 2024*

Smart Stacking of DL Models for Granular Joint Intent-Slot Extraction for Multi-Intent SLU [Link]   *IEEE Access, 2021*

Intent Focused Semantic Parsing and zero-shot Learning for OOD detection in SLU [Link]   *IEEE Access, 2021*

Patents

Methods and systems for determining missing slots associated with a voice command [Link]   *US, A1, 2023*

Method and system for mitigating physical risks in an IoT environment [Link]   *US, A1, 2023*

ASIIST - Assisting Seamless Indirect Interaction in Smart Home   *Filling Ongoing*

Dynamic relevance time prediction in Smart Home   *Filling Ongoing*

Industry/Academic Experience

University of Pittsburgh   *PA, USA*

Graduate Research Assistant   *Sep 2024 - Present*

- Developing and refining techniques for memory/model editing in LLMs.Commonsense knowledge editing.

University of Pittsburgh   *PA, USA*

Teaching Assistant - Intro to NLP & Operating System   *Sep 2023 - Apr 2024*

- Conducted weekly recitations for class of 50 undergrad students. Graded quizzes and assignments.

Samsung Research Institute   *Bangalore, India*

Lead Engineer, Speech Recognition & Natural Language Processing - Voice Intelligence R&D   *June 2019 - August 2023*

- **Role:** Research, Design and Develop solutions for Bixby's (Conversational AI) industry-level NLU challenges.
- **CoSMIC - Contextual SmartThings Multi-Intent Composer:** Researched and commercialized BERT-based Multi-Intent NLU for SmartThings. Achieved **96% E2E Accuracy** with **12% performance boost**. Reduced the error rate by **67%**.
- **Conversational AI:** Worked on complex scenarios of Multi-Intent and Slot Classification, Zero-Shot Out-Of-Domain Detection, Intelligent Device Resolution service, Bixby Recall - Chat Question Answering (QA) System and Knowledge Representation.
- **Achievements: Publications (x2), Patents (x4), MBO High Performance Bonus (x3), Samsung Excellence and other awards (x5), CLab Finalist.**

IBM   *Bangalore, India*

Extreme Blue Intern - Template based Machine Learning Models for MVS   *May 2018 - July 2018*

- Designed and developed a time series forecasting, self-learning, DL system to predict, prevent or auto-resolve or assist in IT infrastructure Failure.
- **Achievement: [HA2] 2nd Runner Up - Audience Poll Category, IBM Extreme Blue Expo**[Link]

Indian Institute Of Technology (IIT)   *Kharagpur, India*

Teaching Assistant - Programming and Data Structure lab & DBMS   *July 2018 - May 2019*

- Thought lectures on Programming & DBMS concepts to a class of 80+ undergrad students. Evaluated lab assignments and tests.

Projects

Web Agent for complex decision making [Ongoing]   *PhD Term Project, CMU*

DCLL: A DL Model For Simultaneous Travel Time and Traffic Congestion Prediction [Link]   *M.Tech. Thesis Project*

Automatic Concept Map generation from text-based Learning Material [Link]   *Term Project*

Twitter Sentiment Analysis [Link]   *B.Tech. Final Year Project*

Skills

Specialization	Machine Learning Engineering for Production (MLOps) [Link]
Programming	Python, C/C++, JavaScript, LaTeX, Verilog
Deep Learning	Keras, Tensorflow, Pytorch, Pytorch Lightning, MLFlow
Web Development	Flask, Django, HTML5, CSS, Bootstrap, React
Graph DB	Neo4j