

Priyanshu Gupta

Associate Researcher II
PROSE Group, Microsoft Redmond

priyansgupta@microsoft.com | priyanshu.42g@gmail.com
Google Scholar : Priyanshu Gupta
Github : www.github.com/purug2000
+91 9559006855

INTERESTS

Primary: Generative AI, Large Language Models, Developer Productivity
Others: AI for Software Engineering, Natural Language Processing, Agent Based Systems

SKILLS

Languages: Python, C, .NET *with familiarity in* C++, Java and TypeScript
Frameworks/libraries: PyTorch, Scikit-learn, Transformers

EXPERIENCES

Microsoft

Researcher

2021- present, *Bangalore, India*

Github Copilot for Visual Studio and Visual Studio Code

- Contributed extensively on Copilot Chat by implementing the testing infra., owning chat modes and bug fixes.
- Built a simple bespoke framework to enable agent based contextual multi-turn conversations within copilot.
- Developed an LLM-based multi-agent autonomous system for assisting users upgrade their Java codebase within **Github Copilot**. Copilot for Java Upgrade was featured at **Github Universe '24** event.
- Built and owned an LLM based chat experience in **Github Copilot** to assist users with **cloud migration** tasks. The experience helps 1000 users daily to migrate their projects to azure. Featured in Build '23.

Intelligent Next Code Edit Prediction

- Evaluated LLM's capabilities to predict future edits given prior edits by experimenting with different prompting styles and fine-tuning a small Language Model for edit prediction. *GrACE; Gupta et.al. FSE' 23*
- Designed a novel technique to automatically learn patterns from code editing data and using them for next edit prediction. Shipped feature in **Intellicode** with 2000 daily hits. *Overwatch; Zhang et.al. OOPSLA' 22*

Misc. Research on Language Agents

- Proposed a technique for improving Language Agents by adding to them a memory of instructions learnt from past failures and improved performance of production systems by 5-25%. *MetaReflection; Gupta et.al. EMNLP'24*
- Developed a technique to fix errors in Retrieval Augmented Generation(RAG) databases using RAG system failures that improves performance by upto 9% across internal and external scenarios. *StackFeed; Gupta et.al. arxiv.*

Adobe Research India

Research Internship

Summer'20, *Adobe Research Labs, Bengaluru*

Improving Experience Interface - Fact Extraction and Verification

- Proposed a multi-stage retrieval and reasoning technique to verify factoid claims over a free-text Wikipedia corpus.
- Beat the existing State of the Art performance on the ACL FEVER dataset by 1 percent in terms of the FEVER score with a **10 percent** improvement on claims requiring multiple evidences.

(*Patent Granted*)

PATENTS

Machine Learning Techniques for augmenting Electronic Documents with data verification Indicators [\[US11687716B2\]](#)

Navita Goyal, Vipul Shankhpal, Priyanshu Guta, Ishika Singh, Baldip Singh Bijlani, Anandha velu Natarajan

PUBLICATIONS

METAREFLECTION: Learning Instructions for Language Agents using Past Reflections [\[Link\]](#)
Priyanshu Gupta, Shashank Kirtania, Ananya Singha, Arjun Radhakrishna, Sherry Shi, Gustavo Soares
Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing(EMNLP)

Grace: Language Models Meet Code Edits [\[Link\]](#)
Priyanshu Gupta*, Avishree Khare*, Yasharth Bajpai, Saikat Chakraborty, Sumit Gulwani, Aditya Kanade, Arjun Radhakrishna, Gustavo Soares, Ashish Tiwari
ACM Symposium on the Foundations of Software Engineering (FSE), 2023

Overwatch: Learning Patterns in Code Edit Sequences [\[Link\]](#)
Priyanshu Gupta*, Yuhao Zhang*, Yasharth Bajpai*, Ameya Ketkar, Miltiadis Allamanis, Titus Barik, Sumit Gulwani, Arjun Radhakrishna, Mohammad Raza, Gustavo Soares, Ashish Tiwari
Proceedings of the ACM on Programming Languages OOPSLA, 2022

TST^R: Target Similarity Tuning Meets the Real World [\[Link\]](#)
 Anirudh Khatri, Sumit Gulwani, **Priyanshu Gupta**, Vu Le, Ananya Singha, Mukul Singh, Gust Verbruggen
Findings of the Association for Computational Linguistics: EMNLP 2023

LOGIC-LM++: Multi-Step Refinement for Symbolic Formulations [\[Link\]](#)
 Shashank Kirtania, **Priyanshu Gupta**, Arjun Radhakrishna
Proceedings of the 2nd Workshop on Natural Language Reasoning and Structured Explanations (@ACL 2024)

A Defocus Based Novel Keyboard Design [\[Link\]](#)
Priyanshu Gupta, Tushar Goswamy, Himanshu Kumar, K.S. Venkatesh
International Conference on Human Computer Interaction (HCI), 2020

Unbiased Estimates of Decomposable Losses for Extreme Classification with Missing Labels [\[Link\]](#)
 Erik Schultheis, Mohammadreza Qaraei, **Priyanshu Gupta**, Rohit Babbar
 Presented at *Workshop on eXtreme Classification, ICML 2020*
 Accepted at *The Web Conference, 2021*

A Probabilistic Framework for Knowledge Graph Data Augmentation [\[Link\]](#)
Priyanshu Gupta*, Jatin Chauhan*, Pasquale Minervini
 Presented at Data-centric AI Workshop @ *NeurIPS 2021*

Source-Free Unsupervised Domain Adaptation using Class Prototypes [\[Link\]](#)
Priyanshu Gupta*, Jinang Shah*, Nidhi Hegde*, Harshit Kumar*, Vaibhav Jindal, Ashutosh Modi
 Presented at SemEval workshop @ *ACL-IJCNLP 2021*

PRE-PRINTS

- **STACKFEED: Structured Textual Actor-Critic Knowledge Base Editing with FeedBack** [\[Link\]](#)
 Naman Gupta, Shashank Kirtania, **Priyanshu Gupta**, Krishna Kariya, Sumit Gulwani, Arun Iyer, Suresh Parthasarathy, Arjun Radhakrishna, Sriram K. Rajamani, Gustavo Soares
Submitted to ICLR'25

- **Augmented Embeddings for Custom Retrievals** [\[Link\]](#)
 Anirudh Khatri, Yasharth Bajpai, **Priyanshu Gupta**, Sumit Gulwani, Ashish Tiwari

EDUCATION

Indian Institute of Technology Kanpur Bachelor of Technology, Computer Science and Engineering CPI: 9.6/10	<i>India</i> July '17 - May '21
Aalto University School of Science Exchange Studies, Computer Science	<i>Finland</i> Jan '20 - June '20

HONORS

2024	Served as a reviewer for ACL, EMNLP and ICLR conferences.
2023	Served as a reviewer for ACL, EMNLP and ICSE conferences.
2019	2nd Prize at the KGMU-IITK Medical Hackathon
2018/19	Awarded Academic Excellence Award twice for academic proficiency by IIT Kanpur
2017	Secured All India Rank(AIR) 599 among 1.5M applicants in JEE-Advanced, 2017
2016	Secured AIR 21 among 100K applicant in KVPY -SX examination.