PARAM BIYANI

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EDUCATION

BITS Pilani - K.K. Birla Goa Campus *August 2019 - July 2023*
B.E. in Computer Science, Minor in Data Science CGPA: **8.96/10**

RESEARCH INTERESTS

AI for Code, Artificial Intelligence, Software Engineering, Human-AI Collaboration, AI for Math, Neuro-symbolic Reasoning

WORK EXPERIENCE

Microsoft, PROSE Team Bangalore, India
Research Fellow *October 2023 - October 2025*

- Led research on an autonomous **agentic AI** system that does whatever a human developer can: task planning, code exploration and editing, part of **GitHub Copilot**.
- Improved agentic performance across multiple systems (spreadsheet manipulation, tool-use, autonomous computer interaction, etc.) using a novel bootstrapping algorithm for creating knowledge bases from past agentic conversation examples.
- Developed a system to autoformalize informal olympiad math problems to Lean 4 theorems, achieving a 95% automation.
- Designed a weakly-supervised learning algorithm to infer human satisfaction and task relevance from conversation data; deployed and used for rubric-based scoring across **Visual Studio Copilot** and **GitHub** assistants.
- Deployment and telemetry analysis of user interactions over AI Debugger with 50K+ daily active users.

Adobe, Adobe Exchange Bangalore, India
Member of Technical Staff *July 2023 - October 2023*
Product Intern *May 2022 - August 2022*

- Integrated code vulnerability checks for Adobe Photoshop and InDesign plugin package upload service.
- Implemented multithreading and asynchronous calls, resulting in 60% accelerated upload speeds on Adobe Exchange.
- Designed a Marketplace Insights feature and its API contracts. The API is now used over a million times weekly.
- Worked on observability on Entitlements Service in Adobe IO using Java SpringBoot, Grafana, Prometheus.

American Express, AI Labs (Data Science) Bangalore, India
Analyst Intern *January 2023 - June 2023*

- Worked with modeling teams at Amex to integrate the models into their production systems. Built a toolkit that allows modellers to track feature importance across decision tree models.
- Developed a custom Gini gain function that improved (1) regularization on data with high missingness and (2) generalization on multi-market models. Improved an internal version of XGBoost, aimed at credit default/fraud prediction.
- Formulated a mixed model imputation strategy for heterogeneous mixed-missingness data.

Speech and Language Lab, NTU | 📄 NTU, Singapore
Research Intern *August 2022 - January 2023*

- Trained convolution-augmented vision transformers to improve the acoustic feature representations of audio signals, improving F1 score our audio analysis pipeline by 10%. Developed a real-time Voice Activity Detection (VAD) system.
- Developed vision transformer models with CRNNs and self-attention to secure top five in DCASE 2023 Challenge Task4b.
- Used by Singapore Technologies for emergency audio event detection in real-world deployments.

PAPERS AND PUBLICATIONS   C = CONFERENCE, W = WORKSHOP

C1. 🏆 **Best Paper Presentation** **Param Biyani***, Yasharth Bajpai*, Arjun Radhakrishna, Gustavo Soares, Sumit Gulwani — **RUBICON: Rubric-Based Evaluation of Domain-Specific Human AI Conversations** *AIware 2024*

C2. 🏆 **Best Paper** Y. Bajpai*, B. Chopra*, **P. Biyani**, C. Aslan, S. Gulwani, D. Coleman, C. Parnin, A. Radhakrishna, G. Soares — **Let's Fix this Together: Conversational Debugging with GitHub Copilot** *VL/HCC 2024*

W1. **Param Biyani**, Shashank Kirtania, Yasharth Bajpai, Sumit Gulwani, Ashish Tiwari — **INDIMATHBENCH: Autoformalizing Mathematical Reasoning Problems with a Human Touch** *P-AI-FM at AAAI 2026; Under Submission ICLR 2026*

W2. Shashank Kirtania, **Param Biyani**, Priyanshu Gupta, Yasharth Bajpai, Roshni Iyer, Sumit Gulwani, Gustavo Soares — **Improving Language Agents Through BREW** *MTI-LLM at NeurIPS 2025; Under Submission ICLR 2026*

W3. B. Chopra*, Y. Bajpai*, **P. Biyani**, G. Soares, A. Radhakrishna, C. Parnin, and S. Gulwani — **Exploring Interaction Patterns for Debugging: Enhancing Conversational Capabilities of AI-assistants** *HCI and NLP at NAACL 2024*

SELECTED RESEARCH PROJECTS

AutoDev: Autonomous Programming Agent June 2024 - March 2025
- Designed and led a 6+ month research project on automating software development using multi-agent AI systems.
- Built specialized agents for planning, retrieval, code generation, and review, enabling structured and modular task execution.
- Developed key tools and internal infrastructure that supported multiple other agents.
- Designed and evaluated experiments to enable decisions on key system designs for GitHub Copilot.

IndiMathBench: Formal theorem proving benchmark and autoformalization study | 📄 July 2025 - Sept 2025
- Created a 312 sized benchmark for Automated Theorem Proving benchmark in Lean4 from Indian Mathematical Olympiads.
- Conducted a systematic study of Human-AI collaboration on formalization tasks.
- Created a VS code extension to speed up Lean annotation by 3.5x, using multi-LLM formalization and group reflection.

RUBICON: Human-AI conversation evaluation | 📄 | ▦ October 2023 - April 2024
Under Dr. Gustavo Soares and Dr. Arjun Radhakrishna *Microsoft PROSE*
- Devised a learning technique that generates user satisfaction and domain relevant assertions from conversational data.
- Designed a custom scoring function and greedy based algorithm to select top n assertions from a larger pool of generations.
- Improved classification rate with confidence of > 0.9 by 56%, and F1 score by 16%.

Mixed Model Imputation for Mixed-Missingness Data April 2023 - June 2023
Under Dr. Narayanan U Edakunni *American Express, AI Labs*
- Ideated a novel imputation strategy that uses different imputation methods based on the type of missingness of features.
- Demonstrated its superiority over standard imputation methods on high-missingness financial Amex data.

SELECTED MISC PROJECTS

- Implemented my own compiler and programming language designed to program a Tetris video game |
- Developed a racing game with cars modelled after real cars built by SAE, BITS Goa using **Blender** and **Unity 3D** on **C#**.

TEACHING ASSISTANTSHIPS

Machine Learning, Deep Learning, Foundations of Data Science, Object Oriented Programming, Computer Programming

EXTRACURRICULARS

CS Department Student Body, BITS Goa | *Academic Coordinator*
- Founded the ASCII Mentorship Programme during undergrad. A student led set of projects aimed at research output. Involves 24 projects offered by 37 seniors and 10 professors. More than 300 students are involved in the projects.

TECHNICAL SKILLS

Languages:	Python, C, C++, Lean 4, Java, C#, JavaScript
AI:	Prompt Engineering, RL, Fine-Tuning, Developing Agentic Systems, RAG, Transformers
Softwares & Tools:	Pytorch, Tensorflow, All popular LLM usage/APIs, SpringBoot, FSL, Blender 3D

RELEVANT COURSES

Computer Science:	Data Structures and Algorithms, Operating Systems, Object Oriented Programming, Database Management Systems, Computer Networks, Design and Analysis of Algorithms
ML/AI:	Deep Learning, Machine Learning, Reinforcement Learning, Linguistics, Applied Statistical Methods, Cognitive Neuroscience, Computational Learning Theory (Audit)

ACHIEVEMENTS

- Best Paper Award, VL/HCC 2024; Awarded by IEEE Symposium on Visual Languages and Human-Centered Computing.
- Best Paper Presentation Award, AIware 2024; Awarded by ACM International Conference on AI-Powered Software.
- Merit Scholarship for being in the **top 3%** of students based on Academic Performance.