




INDRANEIL PAUL



 Email  Github  HuggingFace  Scholar  Twitter  LinkedIn  Website

I am a doctoral researcher interested in optimising **code generation LM pre-training and post-training**, with an emphasis on **tool usage** and **multilingual performance**. My long-term mission is to enhance model tool use, unlocking the application of LMs beyond text-only settings to areas such as **robot navigation** and **agentic workflows** by improving their capabilities to **reason**, **offload computation**, and learn from **environmental feedback**. I also work on **preference learning** methods to enhance LMs' code generation capabilities along non-functional axes, such as **security** and **efficiency**. My interests span all facets of improving LM training efficacy, including **data curation**, **context length extension**, **modularity**, and **reinforcement learning**. I am also a long-standing open-source contributor to multiple public repositories and have worked on numerous **open-source LM** releases.



























EDUCATION

09/22 – Pres.	ELLIS PhD Candidate in Informatics, TU Darmstadt, Germany	 ENROLMENT
07/17 – 07/19	Masters by Research in Computer Science, IIIT Hyderabad, India	 CERTIFICATE
08/13 – 05/17	Bachelors of Technology in Computer Science, IIIT Hyderabad, India	 CERTIFICATE

SUMMER SCHOOLS

07/23	Lisbon Machine Learning Summer School (LxMLS)	 CERTIFICATE
07/21	European Summer School in Logic, Language and Information (ESSLLI)	 CERTIFICATE

SELECTED PUBLICATIONS

ALETHEIA : WHAT MAKES RLVR FOR CODE VERIFIERS TICK?		 ABSTRACT  PDF
ACL 2026, San Diego		
Vatsal Venkatkrishna et al. (incl. Indraneil Paul)		
AICD BENCH : A CHALLENGING BENCHMARK FOR AI-GENERATED CODE DETECTION		
EACL 2026, Rabat		 ABSTRACT  PDF
Daniil Orel et al. (incl. Indraneil Paul)		
DROID : A RESOURCE SUITE FOR AI-GENERATED CODE DETECTION		
EMNLP 2025, Suzhou	 SLIDES  ABSTRACT  PDF	
Daniil Orel et al. (incl. Indraneil Paul)		
OBSCURACODER : POWERING EFFICIENT CODE LM PRE-TRAINING VIA OBFUSCATION GROUNDING		
ICLR 2025 Poster, Singapore	 SLIDES  ABSTRACT  PDF	
Indraneil Paul et al.		
BIGCODEBENCH : BENCHMARKING CODE GENERATION WITH DIVERSE FUNCTION CALLS AND COMPLEX INSTRUCTIONS		
ICLR 2025 Oral, Singapore	 SLIDES  ABSTRACT  PDF	
Terry Yue Zhuo et al. (incl. Indraneil Paul)		
IRCODER : INTERMEDIATE REPRESENTATIONS MAKE LANGUAGE MODELS ROBUST MULTILINGUAL CODE GENERATORS		
ACL 2024 Oral, Bangkok ( Outstanding Paper)	 SLIDES  ABSTRACT  PDF	
Indraneil Paul et al.		
STARCODER 2 AND THE STACK V2 : THE NEXT GENERATION		
TMLR 2024	 SLIDES  ABSTRACT  PDF	
Anton Lozhkov et al. (incl. Indraneil Paul)		
ADAPTERS : A UNIFIED LIBRARY FOR PARAMETER-EFFICIENT AND MODULAR TRANSFER LEARNING		
EMNLP 2023 System Demonstrations, Singapore	 DEMO  ABSTRACT  PDF	
Clifton Poth et al. (incl. Indraneil Paul)		
SUB-TASK IMPUTATION VIA SELF-LABELLING TO TRAIN IMAGE MODERATION MODELS ON SPARSE NOISY DATA		
CIKM 2022 Oral, Atlanta	 SLIDES  ABSTRACT  PDF	
Indraneil Paul et al.		





INDUSTRY EXPERIENCE

- 10/25 - 04/26 Applied Scientist PhD Intern, Amazon Inc. (Web Services), Berlin
- Researched RL methods to reduce the cloud tool-calling error-rate in **Amazon Q Developer** agent
 - Explored asynchronous RL approaches for improved distributed training efficiency
 - Automated RL environment creation for agents using infrastructure-as-code emulators
- HuggingFace Transformers** **VeRL** **Megatron-LM** **LocalStack** **AWS Fargate** **AWS AgentCore** **AWS SageMaker**
- 04/20 - 08/22 Applied Scientist, Amazon Inc. (Advertising), Bangalore
- Created text, image and multi-modal models for improving EU ad moderation automation by 28%
 - Researched multi-modal, multi-lingual and multi-task pre-training objectives for ad catalog tagging
 - Devised sample-efficient training methods for ViT models using self-labelling and sub-task distillation
- HuggingFace Transformers** **PyTorch** **CUDA C++** **TensorRT** **AWS SageMaker**
- 07/19 - 03/20 Software Development Engineer, Amazon Inc. (Logistics), Hyderabad
- Implemented a planner enabling merchants to rank options and schedule last-mile package drop-offs
 - Oversaw database tuning, JVM optimizations and message queue setup for event ingestion service
- Spring** **METIS** **Java** **AWS SNS** **AWS SQS** **AWS DynamoDB**

RESEARCH EXPERIENCE

- 09/22 - 12/26 Doctoral Researcher, TU Darmstadt Ubiquitous Knowledge Processing Lab, Darmstadt
- Researched comparative benefits of various PEFT and MoE methods
 - Implemented LLVM IR grounding for improving the multilingual performance of code LMs
 - Demonstrated the benefits of pre-training code LMs with obfuscation grounding
 - Investigating code LM improvement along non-functional axes like runtime
 - Created and solely maintained **VLLM-Code-Harness**, a library for efficient code LM evaluation
- GPT-NeoX** **HuggingFace Transformers** **Axolotl** **TRL** **DistilLabel** **Docker** **LLVM**
- 06/17 - 08/19 Research Assistant, IIIT-H Language Technologies Research Center, Hyderabad
- Employed temporal activity, network and Tweet-based features to characterize verified users on Twitter
 - Curated a **dataset** of 235K+ verified Twitter users, containing 79M+ edges and 494M+ Tweets
- Graph-Tool** **FastAI** **Neo4j** **AllenNLP** **Twitter API** **PowerLaw** **R**
- 06/18 - 07/19 Research Assistant, IIIT-H Machine Learning Lab, Hyderabad
- Researched constraint-aware two-sided matching algorithms on dynamic bipartite graphs
 - Benchmarked non-manipulable preference elicitation mechanisms for ride-sharing drivers
- ParamLS** **CVXOpt** **MATLAB** **C++**

INVITED TALKS

- | | | |
|-------|--|--|
| 10/24 | Challenges in Code LMs, IIIT Hyderabad |  Slides |
| 09/24 | Code Generation : Challenges and Solutions, BHT Berlin |  Slides |
| 04/23 | Parameter-Efficient Fine-Tuning for NLP, MBZUAI |  Slides |
| 01/23 | Multilingual Adapters, TU Darmstadt |  Slides |

OPEN SOURCE EXPERIENCE

- 04/24 - 09/24 MaLA-LM, UTTER Project
- Conducted SOTA multilingual continual pre-training evaluations on frontier LMs
 - Investigated the code completion performance of multilingual LMs in non-English language prompts
 - Worked on the **EMMA-500** model and **MaLA-2** massively multilingual corpus releases
- HuggingFace Transformers** **Megatron-DeepSpeed** **DeepSpeed** **Docker**
- 06/23 - 09/24 BigCode Project, ServiceNow and HuggingFace
- Contributed to **StarCoder-2** pre-training data collection and training ablations
 - Worked on containerization, evaluation framework and annotation for **BigCodeBench**
- LLVM** **HuggingFace Transformers** **Megatron-LM** **Docker**
- 05/17 - 07/17 Google Summer of Code, Green Navigation
- Implemented an LSTM forecaster for the **EV-Charge-Prediction** project to alleviate range anxiety
 - Implemented an ensemble solution that reduced absolute forecasting error by 39%
 - Productionized the Bayesian Optimization service for optimal hyper-param selection in training jobs
- TensorFlow** **Pandas** **BayesOpt**