Sanjay Suryanarayanan

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Education

Manipal Institute Of Technology, MAHE — **Manipal, Karnataka**
Bachelor of Technology in Data Science & Engineering — August 2020 – July 2024

Experience

AI4Bhārat, IIT Madras — **Chennai, Tamilnadu · On-site**
Research Associate — July 2024 – Present
- Advisors: Mitesh M. Khapra, Raj Dabre, Anoop Kunchukuttan
- Working on Multilingual Language Modeling and Machine Translation, with a focus on Indic languages. Additionally, exploring Reinforcement Learning and Mechanistic Interpretability within this domain.

Research Intern — January 2024 – June 2024
- Advisors: Mitesh M. Khapra, Raj Dabre, Anoop Kunchukuttan
- Worked on building large-scale data infrastructure to create, curate, and clean Indic Language data for training LLMs.

Smart Collared Eye Lab, MIT Manipal — **Manipal, Karnataka · On-site**
Undergraduate Researcher — July 2022 – June 2024
- Advisors: Vidya Rao, Abhilash K Pai, Poornima Panduranga Kundapur
- Developed wearable assistive technology for the visually impaired, focusing on scene segmentation and path planning by optimizing models for real-time indoor navigation.

ThirdEye Data — **San Jose, California · Remote**
Data Science Intern — June 2023 – August 2023
- Contributed to a retail project utilizing the Microsoft Azure Suite to blend in-store and online shopping seamlessly.

Apache — **Chennai, Tamilnadu · On-site**
Data Analyst Intern — November 2022 – April 2023
- Developed and maintained an ETL pipeline using Azure services to load SharePoint data into Power BI for compliance analysis, and designed interactive dashboards providing actionable insights to NQ Cranes offices.

FunctionUp — **Bengaluru, Karnataka · Remote**
Data Science Instructor — July 2023 – June 2024
- Facilitated 500+ hours of hands-on workshops on data science concepts and problem-solving strategies for students with non-technical backgrounds, helping them transition into data science.

Research Projects

Representational Analysis for Evaluator LLMs
- Implemented probing classifiers, layer-wise similarity, and causal patching on the FBI benchmark to analyze representations and attributions, uncovering the causes of blindspots in evaluator LLMs.

AgenticMT
- Designed an Agentic Translate–Critique–Refine (TCR) pipeline for machine translation, where LLMs iteratively translate, critique, and refine outputs. Incorporated automatic rubric-based feedback, dynamic stopping criteria, and self-improvement loops to enhance translation robustness across multiple Indic languages.

Bootstrapped RL for MT
- Implemented a bootstrapped RL pipeline using K-shot prompting, iterative filtering, and one-pass back-translation with chrF-based rewards, integrated into a GRPO-style framework for reward-driven translation refinement.

Translationese Reduction Sampler
- Developed an RL-based Translationese Reduction Sampler (TRS) to remove translationese from synthetic data, improving training data quality for low-resource MT.

RL Fine-tuning of IndicTrans3
- Implemented RL techniques PPO, DPO, CPO to fine-tune the IndicTrans3 model, improving translation quality for low-resource Indic languages.