

Ashwin Prasad Shivarpatna Venkatesh

Research Associate | Ph.D. Candidate | Heinz Nixdorf Institute, Paderborn University

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Experience

Ph.D. Candidate

Heinz Nixdorf Institute, Paderborn University

📅 Sep 2020 – Current 📍 Paderborn, Germany

- Researching the application of **Large Language Models** in **static analysis**, particularly in type inference and call-graph tasks. Published papers advancing the understanding of LLM capabilities. [1][2]
- Designed and implemented static analysis techniques for **Python**, improving integration and utility of ML development toolchains.
- Awarded the 🏆 **DAAD Prize** for demonstrating exceptional academic and social achievement among international students.

Projects

SWARM-CG

Swiss Army Knife of call graph micro-benchmarks that standardizes evaluation of call graph analysis tools across multiple languages. [1]

TypeEvalPy

A micro-benchmarking framework for Python type inference tools. Includes integration and evaluation of 30 LLMs. [1][2]

HeaderGen

An automated cell header generator for machine learning Jupyter notebooks with static analysis for Python. [3] 🏆 Distinguished Paper Award

PyCG & Scalpel

Maintenance of open-source static analysis frameworks for Python.

Applied Scientist II Intern

Amazon Web Services (AWS)

📅 May 2025 – Sep 2025 📍 New York City, USA

- Advanced understanding of **AI agent** behavior through causal analysis, interpretability study, and tools for analyzing transformer attention mechanisms.
- Contributed to PolyBench, SWE-bench, and SWE-agent, helping develop and evaluate agents for automated bug fixing.

Research Intern

JetBrains

📅 Aug 2023 – Sep 2023 📍 Berlin, Germany

- Contributed to the development of a generic plugin for PyCharm and DataSpell, to make integration of state-of-the-art code analysis techniques easy.
- Integrated **HeaderGen** into PyCharm demonstrating IDE integration.

Student Research Assistant

Networking Department, Paderborn University

📅 Sep 2019 – Jun 2020 📍 Paderborn, Germany

- Collaborated on the EU-funded **5G-PICTURE** project focused on programmable 5G infrastructure.
- **Co-authored** a research paper, contributions include: implementing, experimenting, and providing statistical evidence.

Interests

Community Building

Talks

Panorama Photography

3D-printing

Domain

Large Language Models

Agentic AI

Static Analysis

Python

Education

Ph.D. in Computer Science

Paderborn University, Germany | Ongoing

M.Sc in Computer Science

Paderborn University, Germany | 2020 |

Grade: 1.5

Relevant Publications

[1] An Empirical Study of Large Language Models for Type and Call Graph Analysis in Python and JavaScript | *EMSE 2025*

[2] TypeEvalPy: A Micro-benchmarking Framework for Python Type Inference Tools | *ICSE Demo 2024*

[3] Enhancing Comprehension and Navigation in Jupyter Notebooks with Static Analysis | *SANER 2023 (CORE A)*

🏆 Distinguished Paper Award

More on Google Scholar

Skills

- Python (*fluent*) | C/C++, Java, Js, PowerShell (*prior experience*)
- Linux | System design | Rapid prototyping
- LangChain | Ollama | Git | Docker | LaTeX | Scripting | FastAPI

Passion Projects

TLDRBook.com

LLM-powered app that generates page-by-page summaries with synced navigation to full text and smart bookmarking.

aishodh.com

LLMs and RAG to analyze data, reduce hallucinations, and generate cited reports.

Irc.news

Balanced news generation from all sides of the political spectrum using LLMs.

More on my homepage