DIPIN KHATI

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RESEARCH SUMMARY

PhD Candidate in Computer Science specializing in **AI for Code**, focusing on the design of **trustworthy, interpretable, and agentic systems** that enhance software engineering workflows. Experienced in evaluating and improving LLMs through **counterfactual reasoning**, **RAG pipelines**, and **empirical studies** of developer–AI collaboration. Skilled in **prompt engineering**, **causal inference**, and **dataset development** for model evaluation and hallucination mitigation. Passionate about bridging deep learning research and applied software engineering to create transparent, reliable, and adaptive AI systems for real-world development environments.

Research interests: Trustworthy AI, Agentic Systems, Model Evaluation, Interpretability, AI for Software Engineering

EXPERIENCE

COVES Fellowship — May '25 – Aug '25
Coves Fellow — *Richmond, VA*

- Authored a policy memo on trustworthy AI, synthesizing literature on LLM risk dimensions (**hallucination, bias, privacy**) for the Virginia Office of Delegate Bonita Anthony.
- Translated complex technical risks into accessible language for legislators, directly informing **Virginia House Bill 2268**.

Semeru Research Group (W&M) — June '23 – Present
Research Assistant — *Williamsburg, VA*

- Investigate how LLMs impact software development, focusing on **trustworthiness**, **reliability**, and **interpretability**.
- Conduct empirical studies on software engineering workflows using surveys and interviews (**N=200+ participants**).
- Mentor junior PhD students and supervise undergraduate researchers.

Computer Science Department (W&M) — Aug '21 – May '23
Teaching Assistant — *Williamsburg, VA*

- Mentored over **120 undergraduate students** across core CS courses including Algorithms, Formal Languages, and Finite Automata.
- Led weekly office hours and supplemental review sessions.

T-Mobile — Jan '21 – Jul '21
Software Developer — *Bellevue, WA*

- Refactored a monolithic PoS system into a scalable **microservices architecture** using **Java, Spring Boot, Docker**.
- Improved system reliability and accelerated release cycles from monthly to biweekly.
- Diagnosed and resolved critical production bugs.

Computer Science Department (Troy University) — Jan '20 – May '20
Computer Science Tutor — *Troy, AL*

- Provided one-on-one tutoring to 5–7 students weekly in foundational CS topics.

TECHNICAL SKILLS

- **Programming:** Python, Java, C/C++
- **Deep Learning & ML Frameworks:** PyTorch, TensorFlow, PyTorch Lightning, Hugging Face, Scikit-Learn, MLflow, LangChain
- **AI Research Tooling:** RAG Pipelines, Prompt Engineering, Counterfactual Evaluation, Causal Inference
- **Developer Tools:** Docker, Git, Spring Boot
- **Research Expertise:** Trustworthy AI, Agentic AI, Hallucination Mitigation, Explainable AI
- **Empirical Methods:** Survey Design, Qualitative Coding

EDUCATION

College of William and Mary — 2021 – Present
Ph.D., Computer Science, GPA: 3.74 — *Williamsburg, VA*

Troy University — 2016 – 2020
B.S. in Computer Science, Minor in Mathematics, GPA: 3.89 — *Troy, AL*

PUBLICATIONS

- **D. Khati**, Y. Liu, D.N. Palacio, Y. Zhang, D. Poshyvanyk. "Mapping the Terrain: LLMs in Software Engineering Insights and Perspective." [**TOSEM**]
- **D. Khati**, D. Rodriguez-Cardenas, D.N. Palacio, A. Velasco, D. Poshyvanyk. "On Explaining (Large) Language Models for Code Using Global Code-Based Explanations." [**Major Revision**]
- Alejandro Velasco, Daniel Rodriguez-Cardenas, **D. Khati**, David N. Palacio, Lutfar Rahman Alif, Denys Poshyvanyk. "A Causal Perspective on Measuring, Explaining and Mitigating Smells in LLM-Generated Code." [**ICSE 2026**]
- D.N. Palacio, D. Rodriguez-Cardenas, A. Velasco, **D. Khati**, K. Moran, D. Poshyvanyk. "Towards More Trustworthy and Interpretable LLMs for Code through Syntax-Grounded Explanations." [**Major Revision**]
- D. Rodriguez-Cardenas, D.N. Palacio, **D. Khati**, H. Burke, D. Poshyvanyk. "Benchmarking Causal Study to Interpret Large Language Models for Code." [**ICSME**]

PROJECTS

Counterfactual Reasoning for Code — Python, LLM Evaluation, Counterfactual Reasoning
- Developing a multi-turn evaluation framework with counterfactual tasks for Code.
- Measuring robustness and collaborative reasoning in AI Agents and LLM4Code

Agentic AI Interpretability — Python, Agentic AI, XAI
- Building an interpretable agent system that plans, codes, tests, and debugs with transparent reasoning.

Hallucinations in Code Models — Python, LLMs, RAG
- Creating a taxonomy of hallucination types in AI code generation.
- Proposing Hallucination fix using a light-weight AST post-processing

INTERESTS

- AI for Sofotware Engineering, Trustworthy AI, Agentic Workflows, LLM Interpretability
- LLM Evaluation, Causal Inference