

Dr. Krishna Narasimhan

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Profile

Expert in software tooling and model based language engineering with significant experience in academia and industry. My expertise includes managing advanced software projects, international collaboration, graduate and undergraduate-level teaching, and R&D leadership, particularly in software productivity enhancement tools. Academically, I focus on developer tools, program analysis, domain-specific languages, and AI for software assistance. I have a strong record of leading research teams and integrating AI technologies with traditional software engineering

Employment

AIQ

Head of technology

Frankfurt, Germany

November 2023 – Present

I lead the development of technology solutions to evaluate AI-based systems, ensuring they comply with the EU AI Act. My role encompasses both hands-on development and architectural design, as well as managing a diverse international team, including contractual employees and student assistants. Additionally, I provide expert consultancy in the field of AI system quality assurance.

HDA

Lecturer (Part-time)

Darmstadt, Germany

November 2023 – Present

As a Lecturer, I engage with first-year Bachelor of Science students, helping them gain foundational knowledge in programming.

Technische Universität Darmstadt

Researcher/ Lecturer

Darmstadt, Germany

January 2020 – October 2023

I specialized in designing and constructing AI-based code models that prioritize reliability, explainability, and a deep understanding of software semantics. My research advanced API misuse detection and program security standards. Additionally, I teach graduate and undergraduate-level courses on programming languages and AI based software assistance, and I am a member of the university's hiring committee (Berufskommission).

Itemis AG

IT Consultant/Software Architect

Stuttgart, Germany

December 2016 – January 2020

I designed and developed bespoke domain-specific languages and modelling tools, primarily catering to clients in the automotive and embedded systems industries. This involved understanding their unique needs, crafting precise language specifications, and building user-friendly tools to improve their operational efficiency and project effectiveness.

Goethe Universität

Research/Teaching Assistant

Frankfurt, Germany

September 2013 – December 2016

Managed the foundations of programming languages lecture series while conducting research on addressing productivity issues associated with software evolution.

Universität des Saarlandes

Research/Teaching Assistant

Saarbrücken, Germany

September 2011 – September 2013

Contributed to the software engineering chair as a research assistant, supported graduate-level courses on software engineering and security, and aided the team in developing advanced program analysis tools for android malware detection.

Scantron

Software Development Engineer

Chennai, India

September 2010 – September 2011

Developed and maintained a diverse software suite for the education sector, utilizing languages such as Script#, SQL, and JavaScript. Collaborated with a team of developers and testers to deliver high-quality software products.

Education

Goethe Universität

Ph.D. in Computer Software, Suma cum laude

Frankfurt, Germany

2014–2017

Thesis - Combining user interaction and automation to evolve source code.

Universität des Saarlandes

Master of Science - MSc, Computer Science

Saarbrücken, Germany

2011–2014

Thesis - Android decompression chamber: A hybrid(static/dynamic) approach to detecting android malware.

Anna University

Master of Computer Applications - MCA

Chennai, India

2007–2010

University of Madras

Bachelor of Science - BSc, Mathematics

Chennai, India

2004–2007

Service

I have served on the program committee of several top-tier software engineering conferences including ECOOP, SLE, ISSTA, and OOPSLA.

Projects

jGuard: Java extensions that allow making APIs misuse resilient by design (MPS-based). Video demonstration

Transparent abstractions: Effective methods to simplify software reuse - Website

CogniCrypt: State of the art in allow-listing based API misuse detection. Website

mbeddr: an extensible set of integrated languages for embedded software development - Website

Skills

Technical skills: Experienced in object oriented programming languages and building domain-specific languages/ modelling tools using XText and JetBrains MPS. Skilled in static/dynamic program analysis and tooling for code assistance. Experienced in building cloud-based AI solutions on top of Azure. Proficient in software design, maintenance, and security.

Soft skills: Experienced in technical writing, presenting, and leadership. Strong collaborator with international and inter-disciplinary teams. Effective educator at graduate and undergraduate level.

References

1. **Prof. Dr. Christoph Reichenbach**: Relationship: Supervisor, Homepage, Contact: creichen@acm.org, christoph.reichenbach@cs.lth.se
2. **Dr. Julia Lawall**: Relationship: Supervisor, Homepage, Contact: julia.lawall@inria.fr
3. **Prof. Dr. Rodrigo Bonifacio**: Relationship: International Collaborator, Homepage, Contact: rbonifacio123@gmail.com
4. **Prof. Dr. Mira Mezini (use only when needed)**: Relationship: Managing Professor, Homepage, Contact: mezini@informatik.tu-darmstadt.de

PUBLICATIONS

○ Software tooling

- *Fex: Assisted Identification of Domain Features from C Programs*
Patrick Müller, **Krishna Narasimhan**, and Mira Mezini
In 21st IEEE International Working Conference on Source Code Analysis and Manipulation, SCAM 2021, IEEE, 2021, pp. 170–180
<https://doi.org/10.1109/SCAM52516.2021.00029>
- *Cleaning up copy-paste clones with interactive merging*
Krishna Narasimhan, Christoph Reichenbach, and Julia Lawall
In Autom. Softw. Eng., volume 25, number 3, 2018, pp. 627–673
<https://doi.org/10.1007/s10515-018-0238-5>
- *Combining user-interaction and automation to evolve source code*
Krishna Narasimhan
PhD Thesis, Goethe University Frankfurt, Frankfurt am Main, Germany, 2017
<http://publikationen.uni-frankfurt.de/frontdoor/index/index/docId/42783>
- *Interactive data representation migration: exploiting program dependence to aid program transformation*
Krishna Narasimhan, Christoph Reichenbach, and Julia Lawall
In Proceedings of the 2017 ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation, PEPM 2017, ACM, 2017, pp. 47–58
<https://doi.org/10.1145/3018882.3018890>
- *Copy and Paste Redeemed (T)*
Krishna Narasimhan and Christoph Reichenbach
In 30th IEEE/ACM International Conference on Automated Software Engineering, ASE 2015, IEEE Computer Society, 2015, pp. 630–640
<https://doi.org/10.1109/ASE.2015.39>
- *Clone Merge - An Eclipse Plugin to Abstract Near-Clone C++ Methods*
Krishna Narasimhan
In 30th IEEE/ACM International Conference on Automated Software Engineering, ASE 2015, IEEE Computer Society, 2015, pp. 819–823
<https://doi.org/10.1109/ASE.2015.103>

○ API misuse

- *FUM: A Framework for API Usage Constraint and Misuse Classification*
Michael Schlichtig, Steffen Sassalla, **Krishna Narasimhan**, and Eric Bodden
In 2022 IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER), 15.-18. March 2022, Honolulu, HI, USA, IEEE, 2022
<https://doi.org/10.1109/SANER53432.2022.00085>
- *jGuard: Programming Misuse-Resilient APIs* Simon Binder, **Krishna Narasimhan**, Svenja Kernig, Mira Mezini
In Proceedings of the 15th ACM SIGPLAN International Conference on Software Language Engineering, SLE 2022, Auckland, New Zealand, December 6-7, 2022, ACM, 2022
<https://doi.org/10.1145/3567512.3567526>
- *Dealing with Variability in API Misuse Specification*
Rodrigo Bonifácio, Stefan Krüger, **Krishna Narasimhan**, Eric Bodden, Mira Mezini
In 35th European Conference on Object-Oriented Programming, ECOOP 2021, Aarhus, Denmark, July 11-17, 2021, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2021
<https://doi.org/10.4230/LIPIcs.ECOOP.2021.19>
- *BRAID: an API recommender supporting implicit user feedback*
Yu Zhou, Haonan Jin, Xinying Yang, Taolue Chen, **Krishna Narasimhan**, and Harald C. Gall

In ESEC/FSE '21: 29th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering, ACM, 2021, pp. 1510–1514
<https://doi.org/10.1145/3468264.3473111>

○ AI and Software Engineering

- *Towards Trustworthy AI Software Development Assistance*
Daniel Maninger, **Krishna Narasimhan**, and Mira Mezini
In IEEE International Conference on Software Engineering ICSE 2024 (NIER), Lisbon, Portugal, April 14-20, 2024, IEEE, 2024
<https://arxiv.org/abs/2312.09126>
- *Evaluating and improving transformers pre-trained on ASTs for Code Completion*
Marcel Ochs, **Krishna Narasimhan**, and Mira Mezini
In IEEE International Conference on Software Analysis, Evolution and Reengineering, SANER 2023, Taipa, Macao, March 21-24, 2023, IEEE, 2023
<https://doi.org/10.1109/SANER56733.2023.00096>
- *Towards Code Generation from BDD Test Case Specifications: A Vision*
Leon Chemnitz, David Reichenbach, Hani Aldebes, Mariam Naveed, **Krishna Narasimhan**, and Mira Mezini
In CoRR, abs/2305.11619, 2023
<https://doi.org/10.48550/arXiv.2305.11619>
- *Impact of programming languages on machine learning bugs*
Sebastian Sztwierz, Maximilian Grübel, Amine Chouchane, Daniel Sokolowski, **Krishna Narasimhan**, Mira Mezini
In AISTA 2021: Proceedings of the 1st ACM International Workshop on AI and Software Testing/Analysis, Virtual Event, Denmark, July 12, 2021, ACM, 2021
<https://doi.org/10.1145/3464968.3468408>
- *NerdBug: automated bug detection in neural networks*
Foad Jafarinejad, **Krishna Narasimhan**, and Mira Mezini
In AISTA 2021: Proceedings of the 1st ACM International Workshop on AI and Software Testing/Analysis, ACM, 2021, pp. 13–16
<https://doi.org/10.1145/3464968.3468409>

○ Software security

- *Exploring the use of static and dynamic analysis to improve the performance of the mining sandbox approach for android malware identification*
Francisco Handrick da Costa, Ismael Medeiros, Thales Menezes, João Victor da Silva, Ingrid Lorraine da Silva, Rodrigo Bonifácio, **Krishna Narasimhan**, and Márcio Ribeiro
In Journal of Systems and Software, 183, 111092, 2022
<https://doi.org/10.1016/j.jss.2021.111092>
- *To Fix or Not to Fix: A Critical Study of Crypto-misuses in the Wild*
Anna-Katharina Wickert, Lars Baumgärtner, Michael Schlichtig, **Krishna Narasimhan**, Mira Mezini
In IEEE International Conference on Trust, Security and Privacy in Computing and Communications, TrustCom 2022, Wuhan, China, December 9-11, 2022, IEEE, 2022
<https://doi.org/10.1109/TrustCom56396.2022.00051>