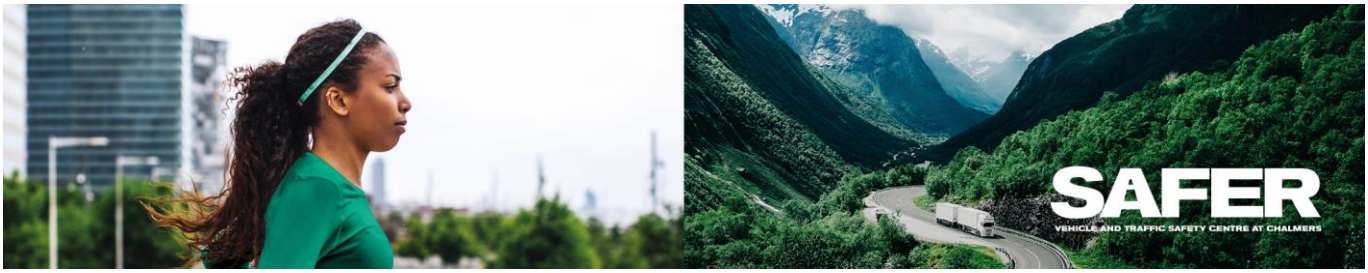

Abstracts and bios for the Autonomous Mobility Research Conference @SAFER

Sep 3, 2025

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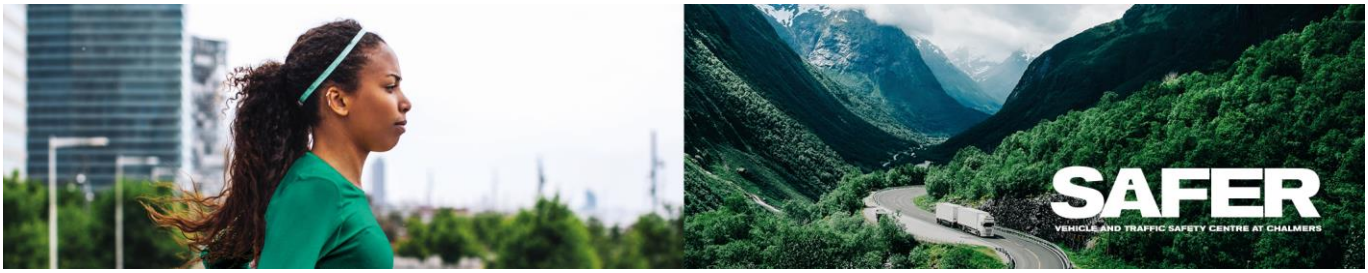
Professor Dr. Devdatt Dubashi, Chalmers University of Technology, dubhashi@chalmers.se

Title: Contextual Learning and Runtime monitoring for Safe Autonomous Systems

Devdatt Dubashi is Full Professor at the Division for Data Science and AI at the Department of Computer Science and Engineering at Chalmers University of Technology. He received his Ph.D. in Computer Science from Cornell University USA and was a postdoctoral fellow at the Max Planck Institute for Computer Science in Saarbrücken, Germany. He was with BRICS (Basic Research in Computer Science, a center of the Danish National Science Foundation) at the University of Aarhus and then on the faculty of the Indian Institute of Technology (IIT) Delhi before joining Chalmers in 2000. He has led several national projects in machine learning and has been associated with several EU projects. He has been an external expert for the OECD report on “Data Driven Innovation”. He has published regularly in the premier machine learning and AI venues such as NIPS, ICML and AAAI. He is CEO of Machine Intelligence Sweden AB and co-founder and chief scientist of Embedl (https://www.embedl.com/about).

Abstract:
We present a novel framework for learning context-aware runtime monitors for learning-enabled cyber-physical systems. Runtime monitors play a critical role in ensuring safety by detecting potentially unsafe situations and triggering appropriate fallback mechanisms when necessary.
A core challenge in designing monitors is balancing safety with performance. Our key insight is to exploit functional redundancy through a diverse ensemble of learned controllers, each trained on different datasets or under varying assumptions. The monitor continuously observes the system’s context and selects the controller best suited to the current conditions, reducing unnecessary switches to conservative fallback strategies.
Unlike conventional ensemble methods, such as averaging-based boosting or bagging, our contextual monitors dynamically select controllers based on operational context, allowing for more effective leveraging of individual controller strengths.
We cast monitor learning as a contextual learning problem and apply techniques from contextual multi-armed bandits. Our approach provides two main advantages: (1) theoretical safety guarantees in controller selection, and (2) improved utilization of controller diversity. We validate our framework in a simulated autonomous driving scenario, demonstrating significant improvements in both safety and performance compared to non-contextual approaches.



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Ali Nouri, PhD candidate, Volvo Cars and Chalmers University of Technology, ali.nouri@volvocars.com, https://ali-nouri.com/

Ali Nouri is a researcher at Volvo Cars and Chalmers University of Technology, specializing in AI and the safety of autonomous driving. He has 10 years of experience in the automotive industry and represents Sweden in ISO standardization efforts, including ISO/PAS 8800 (Safety of AI) and ISO/TS 5083 (Safety for Automated Driving Systems).

Title: Towards Faster DevSafeOps for Autonomous Driving via Generative AI

Abstract:
Vehicles today require rapid innovation, which is enabled through DevOps practices. However, safety-related software development involves rigorous processes, a concept referred to as DevSafeOps, that can naturally slow down development speed. The complexity of autonomous vehicle architectures and their surrounding environments makes this more challenging.
The rise of Generative AI techniques, such as Large Language Models (LLMs), raises the question of whether these tools can support or automate parts of the software development lifecycle, including safety analysis, coding, and testing.
In this talk, we explore the capabilities and limitations of Generative AI in supporting various safety-critical software development activities, such as code generation, safety analysis, and test case generation.

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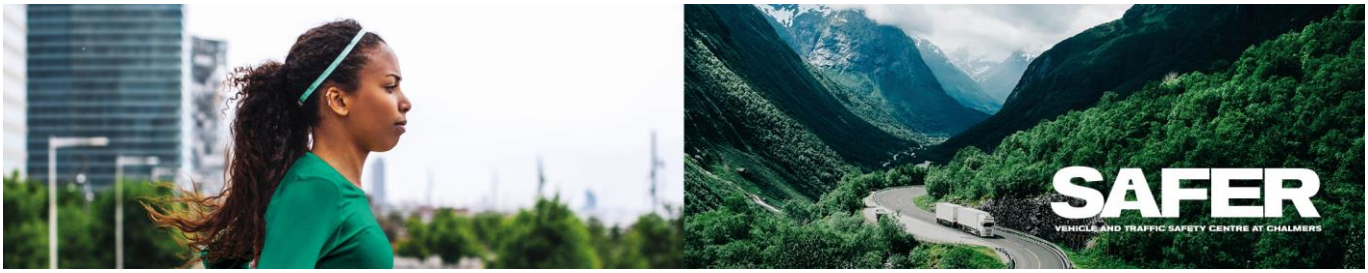
Assistant Professor Dr. Yinan Yu, Chalmers University of Technology, yinan@chalmers.se, https://usableai.se/

Yinan Yu is Assistant Professor at the Division for Computing Science at the Department of Computer Science and Engineering at Chalmers University of Technology. Her research focuses on developing technical solutions to make AI more usable and help create a more accessible and sustainable world. She is working extensively with diverse data modalities, including texts, images, and time series, and she is enjoying to organize and manage data lakes to make data more accessible and searchable for their end-users. She loves designing and implementing deep learning techniques for multimodal learning to unlock the full potential of data! By closely collaborating with industry partners, she aims to create research that is both practical and impactful, focusing on sectors such as healthcare, automotive,, banking, and smart manufacturing. Additionally, she co-founded the startups Asymptotic AIAsymptotic AI and Lumilogic, which operate across various stages of



the AI life cycle. These ventures allow her to validate and apply her research in real-world settings.

Title: Full-stack machine learning for safer and smarter automotive systems

Abstract:
In this talk, I will discuss full-stack automotive development, spanning software engineering, the creation of digital twins for more equitable city infrastructure and energy-efficient built environments, and the application of physics-guided machine learning for automated vehicle control and testing. Together, these efforts demonstrate how AI can connect software automation, system-level simulation, and real-world control to advance safer, more sustainable, and more inclusive mobility solutions.

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Dr. Yuri Tarakanov, Viscando AB, yury@viscando.com, www.viscando.com

Yuri Tarakanov has a long experience within ADAS and autonomous driving. After finishing his PhD in Applied Physics from Chalmers University of Technology, Sweden, Yuri has joined Active Safety & Autonomous Driving department at Volvo Cars. He has been involved in safety architecture and AD verification strategy development, virtual verification tools such as software- and hardware in loop simulations, and multiple research projects within ADAS, AD and AI. In 2020, Yuri joined Viscando AB in a role of Business & Research manager. In this role, Yuri helps automotive research and development organizations seize the opportunities and benefits of bias-free and accurate naturalistic data on movements and interactions of road users.

Title: Accelerating research and development of automated vehicles with smart sensors in the infrastructure

Abstract:
To operate safely and efficiently in complex traffic, automated and autonomous vehicles must recognize traffic situations, predict the actions of fellow road users, and act in a safe and predictable way. Modelling traffic situations and road user behaviors requires vast amounts of high-resolution traffic data, which is time-consuming and expensive to collect using instrumented vehicles. In my talk, I will present how 3D&AI based sensors in the infrastructure provide detailed traffic knowledge, behavior models and extended situation awareness through bias-free and accurate traffic data – accelerating research and development of novel ADAS functions, autonomous vehicles and safe traffic infrastructure.

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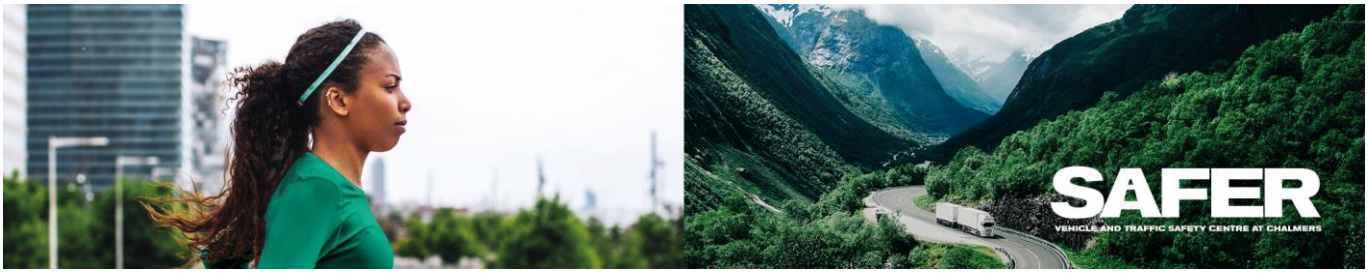

Professor Dr. Miroslaw Staron, University of Gothenburg, miroslaw.staron@chalmers.se, www.staron.nu

Miroslaw Staron is Full Professor at the Division for Interaction Design and Software Engineering at the Department of Computer Science and Engineering, which is shared between Chalmers University of Technology and University of Gothenburg. His research interests are in software engineering with a particular focus on engineering of large systems, including AI-based systems. His expertise is in data management, measurement/metrics, programming and architecture in the areas of telecommunication, automotive and, recently, healthcare systems.

Title: AgenticAI - Experiments with agents in software development and outlook for research

Abstract:
Agentic AI is gaining popularity in software engineering. It offers significant boosts for programmers and enables them to master new skills, use new programming languages, and even design systems. This talk will describe experiments with agentic AI based on LLMs done by the SEAS research group. The results show which models perform best, how to use them, and also identify new research questions.

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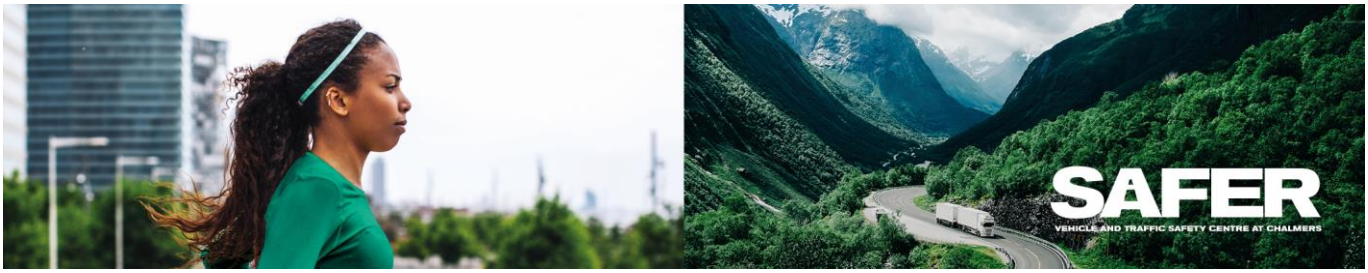
Assistant Professor Dr. Hans-Martin Heyn, Chalmers University of Technology, heyn@chalmers.se, https://martinheyn.github.io/

Hans-Martin Heyn is Assistant Professor/senior lecturer at the Division for Interaction Design and Software Engineering at the Department of Computer Science and Engineering, which is shared between Chalmers University of Technology and University of Gothenburg. His research interests are software engineering for AI and distributed cyber-physical systems. He is especially interested in studying how requirements can be set for training data and data at runtime based on prior knowledge about the problem domain. A research direction that triggered his research interest for achieving this aim is causal modelling.

Title: Including prior knowledge about causality in requirements specifications for machine learning

Abstract:
Specifying data requirements for machine learning (ML) software systems remains a challenge in requirements engineering (RE). Causal modelling offers a promising way to systematically integrate prior domain knowledge into the design of ML software systems. In this talk I will present a workflow for eliciting low-level model and data requirements from high-level prior knowledge using causal models. I will illustrate the approach using an



industrial fault detection system and conclude by discussing future research needed to establish causal modelling as an RE practice.