



**Federal University of Santa Catarina**  
**Software/Hardware Integration Lab**

**From Resilient Autonomous Driving to Cyber-Resilient  
Systems on a Chip**

**Marcus Völp**

**Call for Participation**

Date: Nov 25, 2024

Time: 10:00

Place: Room 105, INE, CTC,  
UFSC

Cyber-physical systems, such as autonomous vehicles, but also drones or satellites, are potential targets of a wide range of attacks, including in the cyberspace. Their proximity to humans turns safety into a key property, not only during normal operation, but in particular while under attack and in situations where cyberattacks succeed in partially compromising the system. In this talk, I would like to highlight some of the recent research results from my team CritiX at the SnT of the University of Luxembourg, illustrating how resilience can be achieved in a team of collaborating vehicles, how collaborating groups can reach consensus in highly dynamic settings, where both the number of nodes  $n$  and with that the fault threshold  $f$  change, and how we can translate what we learn in the large into the small for constructing Cyber-Resilient Systems on a Chip.

*Prof. Dr.-Ing. Marcus Völp received his PhD in computer science in 2011 from Technische Universität Dresden. His research interests include methods, tools and system architectures for constructing resilient cyber-physical and embedded systems for a wide variety of application domains and at various levels of the hardware-software stack, from Industry 4.0 over autonomous vehicles to space and from microkernels and microkernel-based systems that are able to simultaneously fulfill a large range of functional and non-functional properties for the applications they run to distributed algorithms coordinating nearby and far away vehicles. Guarantees must be given concerning real-time, security (including information-flow) and dependability, in particular in terms of Byzantine fault and intrusion tolerance and resilience of unattended systems.*

*Before joining SnT in September 2015, Dr. Völp has been research group leader at the the cluster of excellence - Center for Advancing Electronics Dresden and visiting scholar at the Logical Systems Group of Prof. Platzer at Carnegie Mellon University. Since 2021, he is head of the CritiX lab of the the Interdisciplinary Centre for Security, Reliability and Trust (SnT) at the University of Luxembourg. Prof. Völp is member of the Steering committee of the Euromicro Conference on Real-Time Systems (ECRTS) and senior member of the IEEE.*

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