

NORTHERN ARIZONA UNIVERSITY
School of Informatics, Computing, and Cyber Systems

Seminar in Electrical & Computer Engineering

**Autonomous Vehicles on the Edge:
Autonomous Racing & The Indy Autonomous Challenge**

Speaker: Dr. Johannes Betz, Postdoctoral Researcher, xLab for Safe Autonomous Systems,
University of Pennsylvania

Date: Friday, November 19, 2021; **Time:** 11:00 AM MST

Link (Zoom): <https://nau.zoom.us/j/89649101793>; **Password:** BETZ2021



Abstract: The rising popularity of self-driving cars has led to the creation of an additional research and development branch in the recent years: Autonomous Racing. Researchers are developing algorithms and hardware for high performance race vehicles which aim to operate autonomously on the edge of the vehicle limits: high speeds, high accelerations, high computation power, low reaction time, adversarial environments. In addition, with an increasing number of competitions in the field of autonomous racing, researchers have the platforms to test their high-performance algorithms. This talk will give an overview of the current efforts in the field, the main research outcomes, and the open challenges we can solve with the help of autonomous racing. Especially we will focus on the Indy Autonomous Challenge and the software setup of the TUM Autonomous Motorsports Team – the winning team of the Indy Autonomous Challenge. A detailed look into the software will show how each software module is connected and how we can achieve

high speed autonomous driving on the racetrack.

Bio: Dr. Betz earned both a B. Eng. and a M. Sc. in the field of Automotive Engineering. After earning his PhD at the Technical University of Munich (TUM) he was a Postdoctoral Researcher at the Institute of Automotive Technology at TUM where he founded the TUM Autonomous Motorsport Team. He is currently a Postdoctoral Researcher at the University of Pennsylvania, where he is working in the xLab for Safe Autonomous Systems. His research is focusing on a holistic software development for autonomous systems with extreme motions at the dynamic limits in extreme and unknown environments. By using modern algorithms from the field of artificial intelligence, he is developing new and advanced methods and intelligent algorithms. Based on his additional M.A in philosophy, he is extending current path and behavior planners for autonomous systems with ethical theories.

