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IS1.1

Typhoon Hil, Inc., Novi Sad, Serbia

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MODEL-BASED ENGINEERING IN TEACHING AND RESEARCH: THE TYPHOON HIL WAY

Modern engineering education and research face a dual challenge: bridging the gap between theory and practice, while preparing students and researchers for industry-grade workflows. Hardware-in-the-Loop (HIL) simulation has emerged as a cornerstone of model-based engineering, providing a seamless continuum from conceptual design to real-time validation.

This talk presents the Typhoon HIL approach to model-based engineering in both teaching and research. Starting with early conceptualization in *TyphoonSim*®, students and researchers can design and test models offline. The same models can then be compiled for real-time execution in the *Typhoon HIL Control Center*®, enabling Software-in-the-Loop (SIL) and Model-in-the-Loop (MIL) testing. From there, automated code generation supports direct deployment to microcontrollers, followed by Controller-Hardware-in-the-Loop (C-HIL) testing with physical devices. In this way, a single model evolves step by step, supporting the entire engineering process, from idea to implementation.

For academia, this continuity means that undergraduates can be introduced to real-time HIL platforms at an early stage, while graduate students and researchers can use the same environment for advanced projects, grant-funded research, and industrial collaboration. The vertically integrated Typhoon HIL toolchain reduces complexity, removes the need for third-party add-ons, and provides a cost-effective, zero-cost software ecosystem for education.

IS1.2

Brose d.o.o., Pančevo, Serbia

Radoslav Aleksić, Team Leader System Development Electronics, Brose d.o.o., Pančevo, Serbia

Luka Konovalov, Coordinator System Engineer Electronics, Brose d.o.o., Pančevo, Serbia

SMART COOLING FOR MODERN MOBILITY: THE STORY OF RADIATOR FAN TECHNOLOGY

This presentation explores the fascinating evolution of radiator cooling fans in the automotive industry, tracing their journey from simple mechanical devices to today's advanced, electronically controlled systems. We will highlight key technological milestones, discuss the impact of modern trends such as electrification and digital integration, and examine how these innovations have shaped vehicle performance, efficiency, and sustainability. The session will conclude with an introduction to our company's latest cooling fan solution, showcasing its unique features and benefits in meeting the demands of modern automotive engineering.