ATHENA

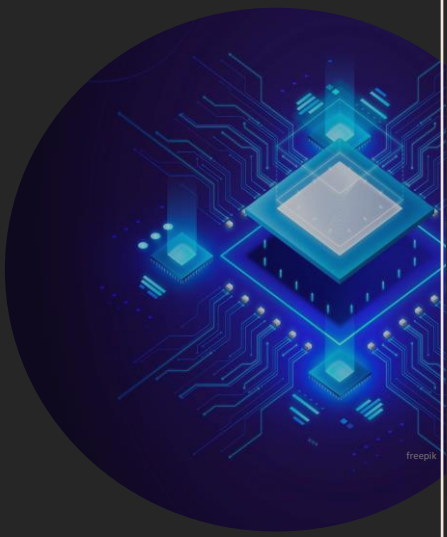
# Embedded Systems

## Online Lecture Series

The Lecture Series is part of the ATHENA Competence Cluster “Embedded Systems”, providing in-depth knowledge in three specific topics within the field of Embedded Systems.

The lectures are open to all interested students and (academic) staff.

Further information >




**16 Nov. '23**
12:00 – 13:30 CET

### Linux and Android for Embedded Systems

Assoc. Prof. Dr. Felipe José Gil Castiñeira
University of Vigo

https://meet.google.com/uno-csdi-nwg?hs=122&authuser=0

**17 Nov. '23**
10:15 – 11:45 CET

### Safety-Relevant Adaptive Embedded Systems

Prof. Dr. Roman Obermaisser
University of Siegen

https://uni-siegen.webex.com/uni-siegen-en/j.php?MTID=ma54a72dcb0ff2610bd48fde4dd371e1b

**12 Dec. '23**
12:45 – 14:15 CET

### Real-time Operating Systems

Assoc. Prof. Dr. Eldar Šabanovič
Vilnius Gediminas Technical University

https://liedm.zoom.us/j/94465819470
Meeting ID: 944 6581 9470
Passcode: 437849

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Universidade Vigo

Universität Siegen

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## Linux and Android for Embedded Systems

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Although Linux is not a real-time operating system, it became one popular alternative for embedded systems, being used both as an operating system, and as middleware platform for the implementation of applications.

In this lecture, we will describe the boot process of a modern ARM CPU, and how Linux configures the system and starts. We will also describe the architecture of Android and how it can be used for implementing embedded systems.

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In this 90-minute lecture, we will address concepts, models and algorithms of adaptive embedded systems for safety-relevant applications. Covered topics include requirements and techniques for fault tolerance and safety, time-triggered systems and adaptation mechanisms. Models and algorithms will be discussed, which enable time-triggered systems to adapt to context events such as faults, slack and changing environmental conditions in order to improve energy efficiency, reliability, safety and flexibility. We will also highlight examples of adaptive time-triggered systems in industrial applications. This lecture offers insight for students who are interested in combining strict safety and real-time guarantees with energy efficiency, flexibility and resource efficiency.

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In this 90-minute lecture, we'll explore the fundamentals of Real-time Operating Systems (RTOS) and their pivotal role in embedded systems. Topics covered include the defining characteristics of RTOS, the distinction between hard and soft real-time systems, key scheduling algorithms, and popular RTOS examples in current applications. We'll also touch upon the challenges faced in RTOS design and implementation. This lecture offers a comprehensive overview for anyone keen to understand the intricacies of real-time systems in the embedded domain.

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