

With friendly support by



European School of Antennas / EuMA Courses on Microwaves

All Digital Radar System Engineering

Organized by



Karlsruhe Institute of Technology

Karlsruhe, Germany

June 28th – July 1st, 2022

Course Plan

Lecture Description

In the last 10 to 20 years, radar is undergoing two major trends. First, near range radars for applications from automotive to industrial are growing enormously with the potential to pass military and space radar regarding the job market for radar engineers. Second, modern radars in all applications become more digital which enables many new techniques to improve performance.


The ESoA/EuCoM course “All Digital Radar System Engineering” covers state of the art radar technologies with a focus on modern digital radars. The course starts with an introduction to the radar basics, like propagation, radar equation, polarimetry, analysis of radar cross section (RCS) of targets, including RCS measurement, etc. After that the radar modulation schemes (mainly chirp-sequence, OFDM & PN) are discussed in detail including deep insights on system design. In cooperation with Bosch special aspects on automotive radar are presented including many real world examples and demos. The last part of the course has a strong focus on the antenna system of the radar. It is dedicated to electronic/digital beamforming and modern synthetic aperture radar technologies for imaging. Thereby a cooperation with the German Aerospace Center (DLR) provides deep insights in state of the art real world systems.


This ESoA/EuCoM course is organized by the KIT
with friendly support by EurAAP and EuMA.















All Digital Radar System Engineering 2022

Time	Tuesday, June 28 th	Wednesday, June 29 th	Thursday, June 30 th	Friday, July 1 st
08:30 - 10:00	Registration	Radar Modulation Schemes I <i>Zwick</i>	Virtual Array Beamforming <i>Younis</i>	Modern Radar Applications <i>Zwick</i>
Break				
10:30 - 12:00	Radar History, Wave Propagation, Polarimetry <i>Wiesbeck</i>	Radar Modulation Schemes II <i>Zwick</i>	Digital Radar Beamforming <i>Younis</i>	Conclusions, Open Discussion
Lunch				12:00 – 13:30
13:30 - 15:00	Radar Equation, Radar Cross Section <i>Wiesbeck</i>	Automotive Radar <i>Kunert</i>	SAR Principles, Spaceborne SAR Missions <i>Younis</i>	Exam 13:30-15:30
Break				
15:30 - 17:00	Radar Basics, CFAR, Beamforming ... <i>Zwick</i>	Automotive Radar Demonstration <i>Kunert, Bosch</i>	SAR Modes and Signal Processing <i>Younis</i>	
17:15-18:00	Exercise, Discussion	Dinner 19:00	Exercise, Discussion	

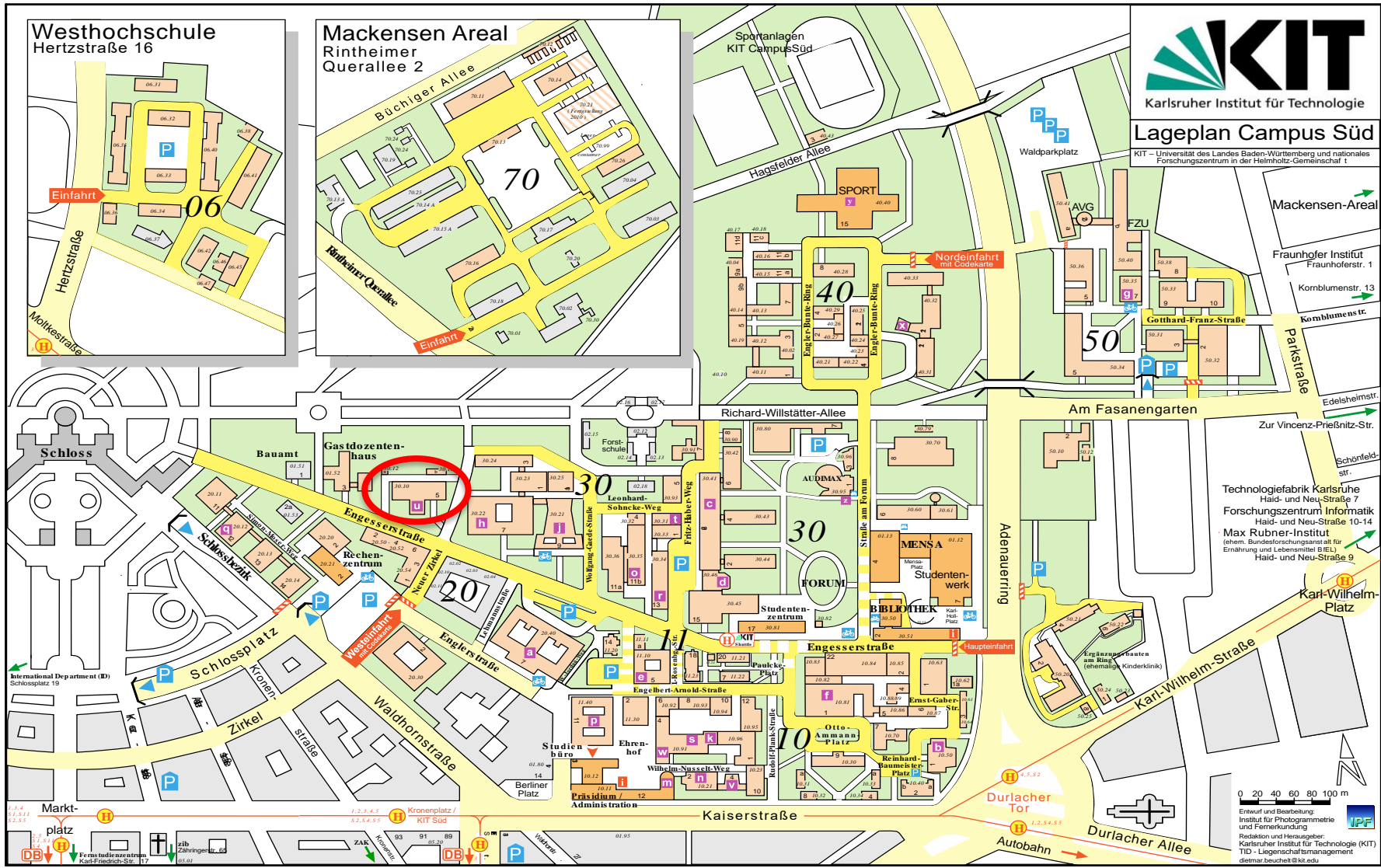
All Digital Radar System Engineering 2022

 Directly antenna & propagation related

 Directly radar related

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Course Venue: KIT-IHE Engesserstr. 5, Building 30.10



KIT 10/2009

Stand: Oktober 2009