

# Preis für exzellente Lehre 2017/18 an der TU Graz

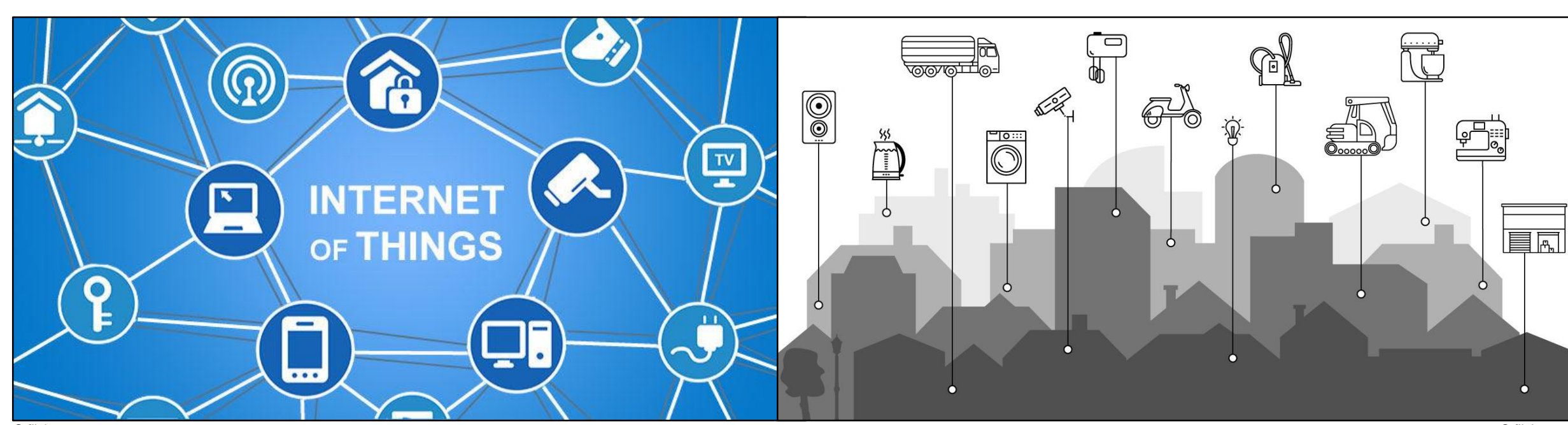
ENDRUNDENTEILNEHMENDE



Vortragender	<b>Carlo Alberto Boano</b>
Titel	<b>Embedded Internet</b>
Art	Vorlesung und Übung (VU)
Nummer	448.052
Semesterstunden	2
Angeboten im	Wintersemester 2015/16, Wintersemester 2016/17, Wintersemester 2017/18, Wintersemester 2018/19
Organisation	Institut für Technische Informatik
Stellung im Studienplan	Wahlfach Masterstudium „Information and Computer Engineering“ (Major im Internet of Things)
ECTS Credits	3

## Engaging Students with Timely Content

- Teaching the fundamentals on networking of embedded systems in the Internet of Things ...
  - One of the key technologies of our society
  - A cutting-edge topic with the highest economic relevance
- ... while putting a strong focus on state-of-the-art IoT technologies and recent developments
  - Course content renewed every year, according to latest trends
  - Covering latest standardization activities and research directions



## Problem-Oriented Learning

- Critical analysis of commercial systems and real-world apps
  - Review of existing systems, their strengths and weaknesses (together in-class or individually as home assignment)
- Examining real-world problems and open research questions
  - Understanding how issues have been tackled by the community
  - Focus on most common pitfalls

## Effective Interaction with Students

- Creating a good working atmosphere based on a high level of interactivity between teacher and students
  - Students addressed by name already from the second lecture
  - Students actively invited to participate in the course and to elaborate given topics and exercises independently or in groups
  - Wrong answers are always seen as an opportunity for learning
- Constant adjustment of course content based on anonymous feedback collected in the middle and at the end of the course
  - Students can mark weaknesses / ambiguities in teaching material
  - Students can suggest which topics they find particularly interesting and would like the teacher to cover more (or less) in depth
  - Students can propose additional topics to be covered in the lecture
- Example of changes introduced since WS 2015/16
  - Home assignments (20% of final grade)
  - Additional chapter on IoT security
  - More focus on real-world commercial IoT applications and products
  - Node-RED tutorial showing how to easily create IoT applications

## Online Quizzes

- Instant polls based on multiple-choice, true/false, fill-in-the-blank, and matching questions
  - Designed using PollDaddy (<https://polldaddy.com/>)
  - Students scan the QR code shown on the slides with the camera of their smartphones / tablets and are prompted a few questions
  - Answers are collected anonymously and are immediately discussed
- Useful to assess whether concepts have been correctly understood
  - Unclear notions are immediately repeated and ambiguities clarified
  - Valuable for determining whether it is necessary to reiterate basic concepts from the Bachelor's degree programs
- Extremely valuable for students as self-assessment tool
  - Available online throughout the whole duration of the course
  - Useful also in view of the exam preparation



<b>Question 02</b>		In the OSI model, as a data packet moves from the lower to the upper layers, headers are:			
		0%	20%	52%	COUNT PERCENT
Y	Removed				23 51%
Y	Added				19 42%
Y	Modified				2 4%
Y	Unaltered				1 2%
<b>Question 04</b>		An IPv6 address is ____ bits long.			
		0%	29.5%	59%	COUNT PERCENT
Y	128				7 58%
Y	64				4 33%
Y	256				1 8%
Y	32				0 0%

Instant polls using QR codes are used during frontal lectures to check whether concepts have been correctly understood or repetitions are necessary (teacher). These polls also serve as a self-assessment of the learning goals (students).

## Course Material and Teaching Aids

- Mix of books, slides, exercises, videos, and online resources
  - Variety of mediums helps students to grasp complex contents
  - Recommended literature free of charge as e-book in the TeachCenter
- Supplementary literature and links to additional reading material and related videos added to the footer of PowerPoint slides, such that interested students can delve into topics they find interesting
- Attendance to the lecture is not mandatory (albeit recommended)
  - Assignments made of fillable PDFs that can be handed in via e-mail
  - Several students with part-time jobs were able to complete the course

