

Lecture

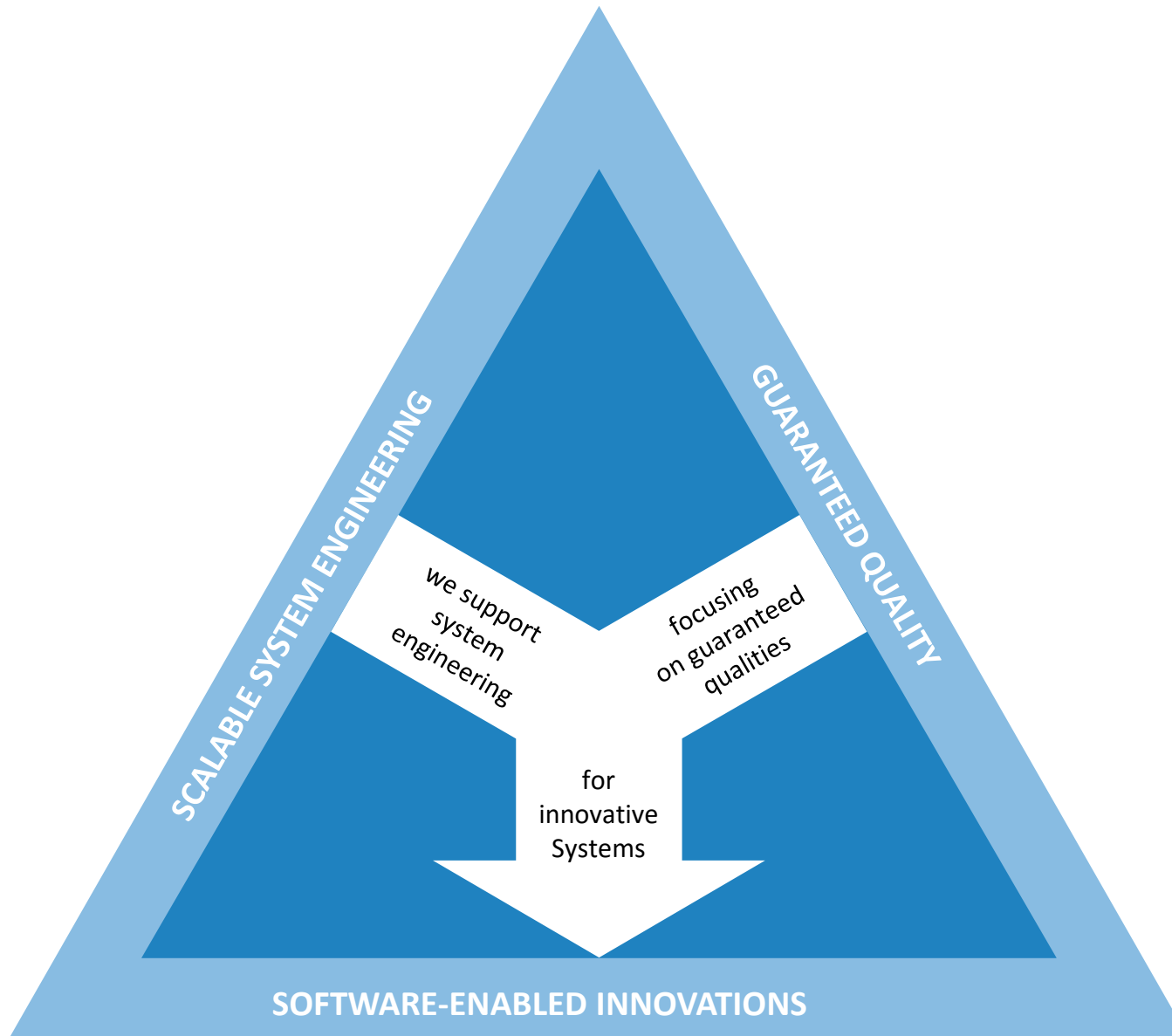
Empirical Model Building and Methods (Empirische Modellbildung und Methoden)

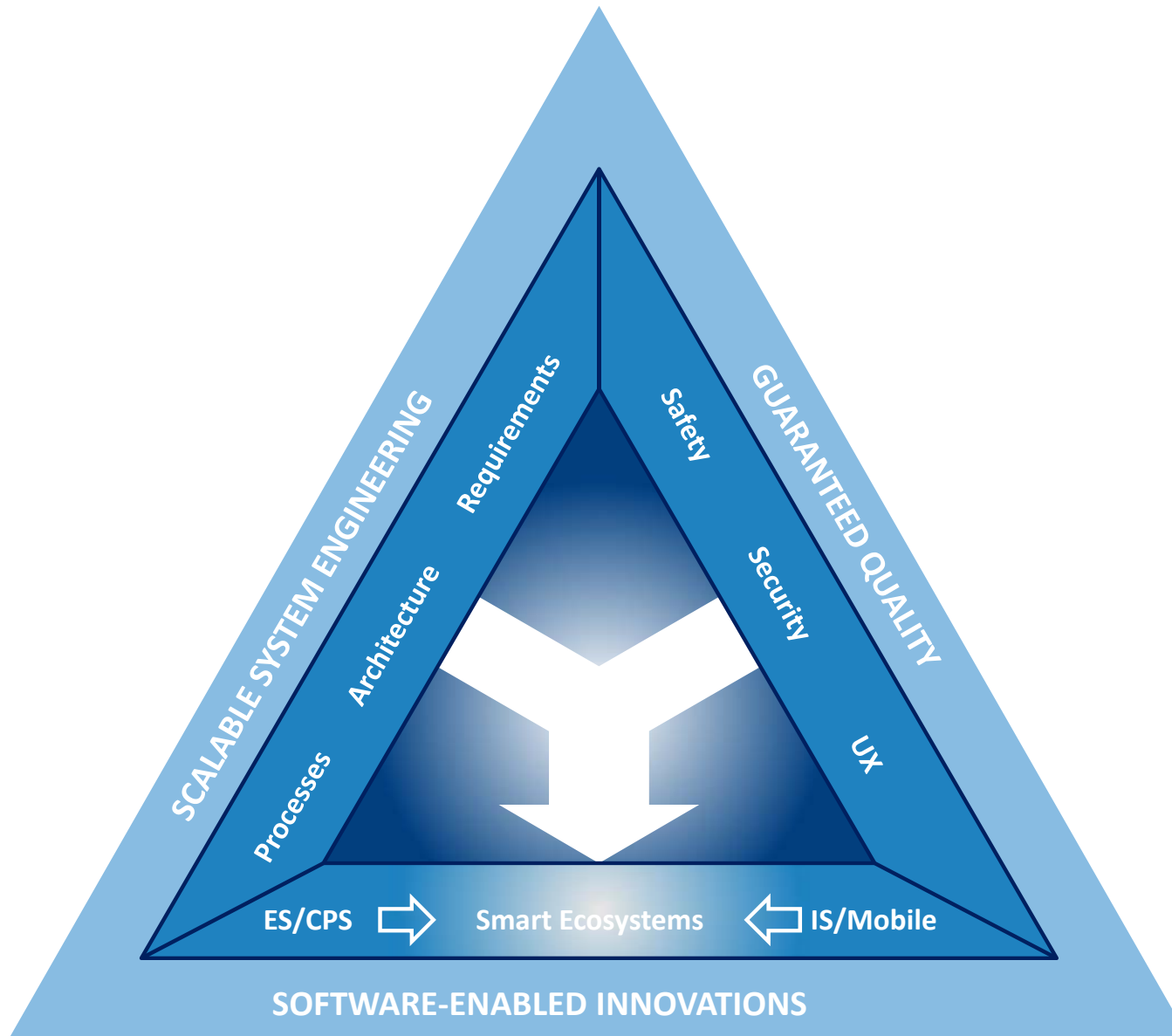
Dr. Andreas Jedlitschka

SS 2016

Administrative Information

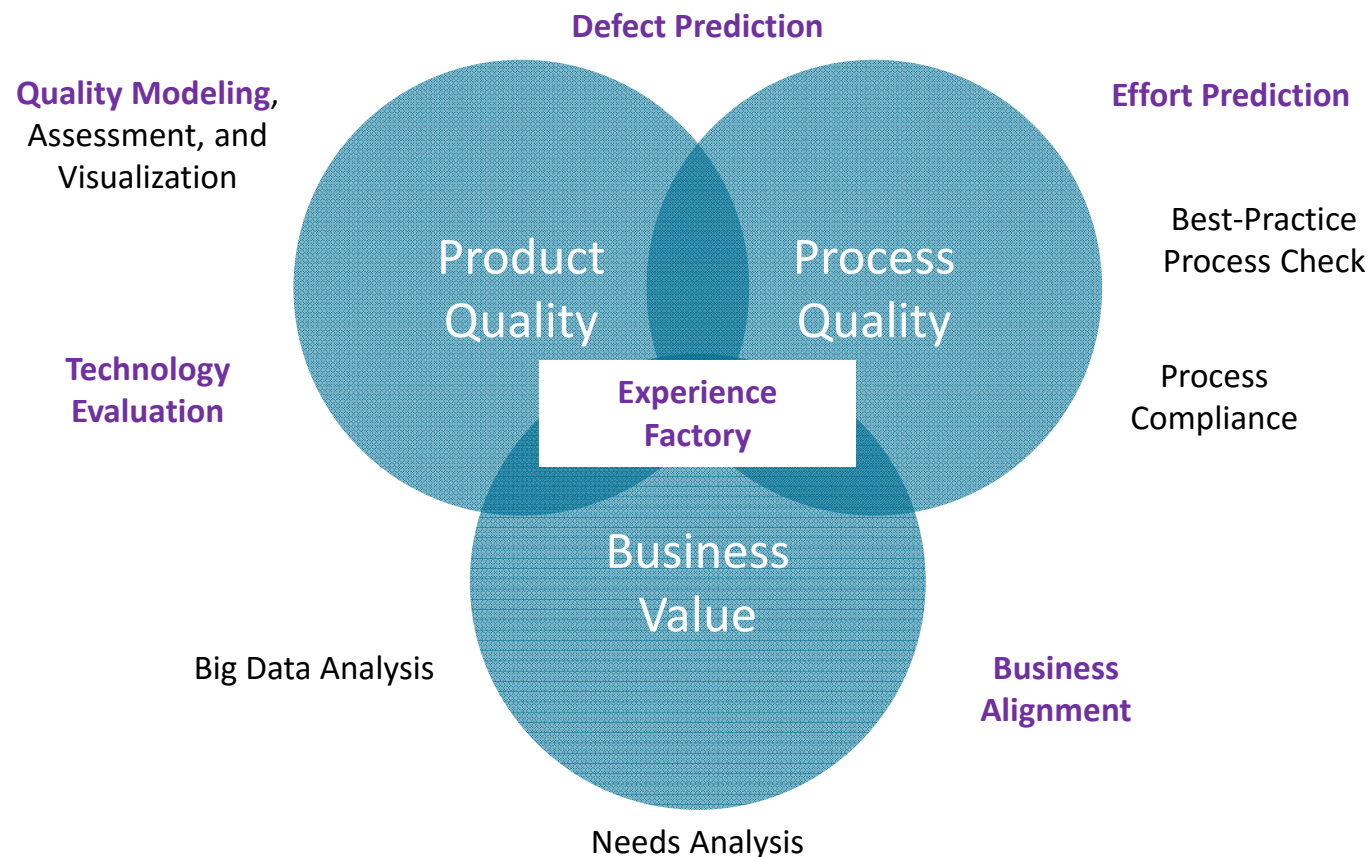






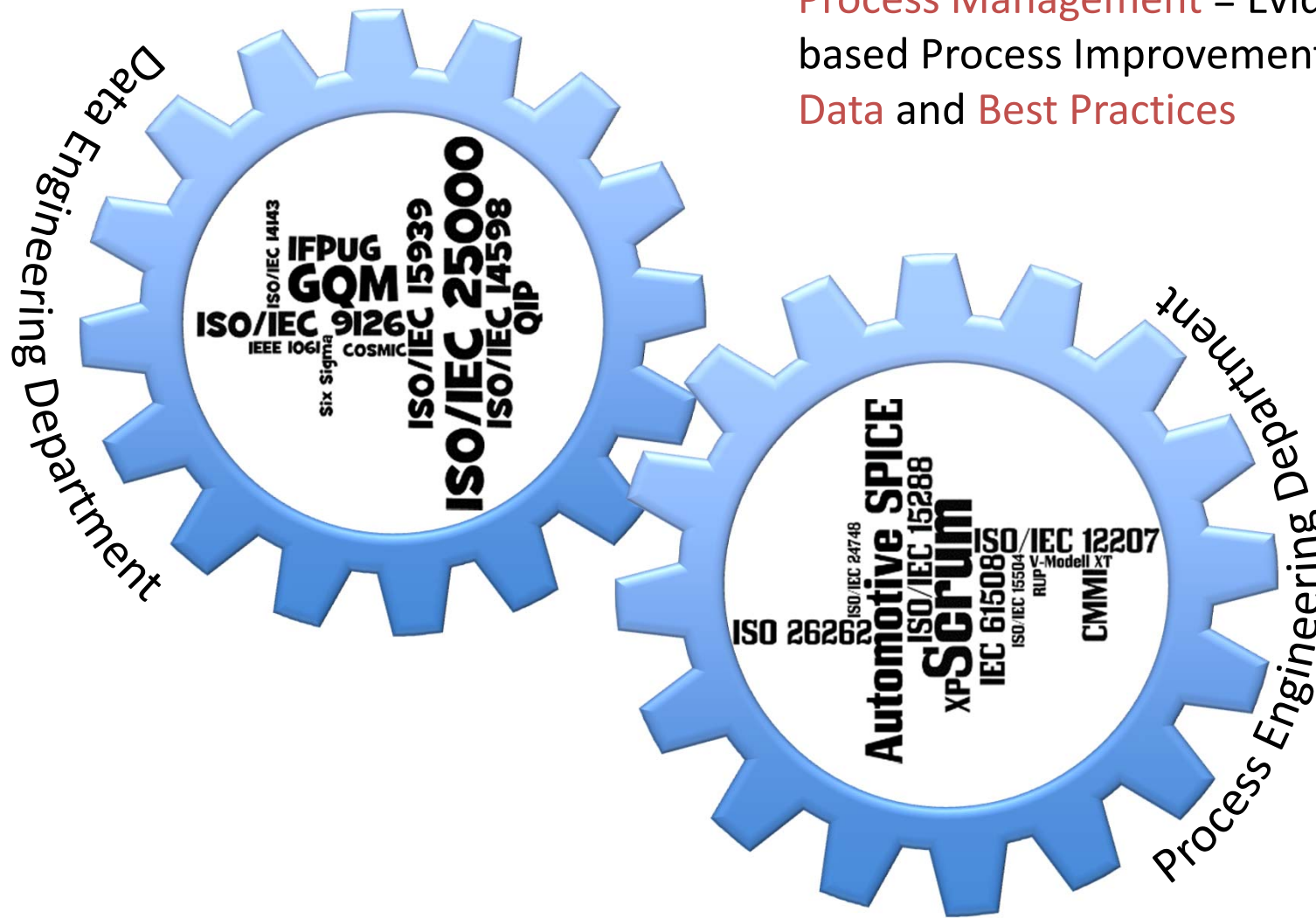
... Engineering of Innovative Systems focusing on Guaranteed Qualities

Process Management is key for obtaining this goal



Process Management

Process Management = Evidence-based Process Improvement based on Data and Best Practices



Goal of the Lecture

- **Increase the awareness of the importance an empirical approach in SE**
- **Providing an overview of the empirical process and how it is used**
 - plan, design, implement, and execute an empirical study
 - analyze and report empirical findings
 - appraise the quality of an empirical study
- **Understand the environment for empirical research**
- **Understand the meaning of empirical models**

This lecture provides the basic knowledge that a researcher,
a
practitioner working on software process improvement,
or a
quality manager
needs today.

SWS: 2

Schedule: Wednesdays, 13:45-15:15

Room 48-453

20.04	Administrative information & Introduction	A. Jedlitschka
27.04.		A. Jedlitschka
04.05.	Measurement process & Model building	A. Jedlitschka
11.05.	Empirical process: Concepts and definitions Empirical process: Definition	A. Jedlitschka
18.05		
25.05	Empirical process: Experimental design	A. Jedlitschka
01.06	Empirical process: Experimental design	A. Jedlitschka
08.06	Empirical process: Implementation Empirical process: Execution	A. Jedlitschka
15.06	Empirical process: Data analysis Empirical process: Reporting	A. Jedlitschka
22.06	Quasi- and non-experimental design	M. Klaes
29.06	Systematic Literature Review	L. Guzman
06.07	Organizational learning Retrospective	A. Jedlitschka
13.07	Students' presentations	A. Jedlitschka

Website: <http://www.wagse.informatik.uni-kl.de/teaching/ese/ss2016>

Exercise

SWS: 1

Schedule: Friday, 13:45-15:15 – Fraunhofer IESE Z13.07 KMU-Center

03.06 Introduction and assignment of topics
Introduction to inspections, PBR reading

17.06 Exercise sheet 1: Problem statement and measures
Exercise sheet 2: Research planning

01.07 Exercise sheet 3: Research design
Exercise sheet 4: Research design

08.07 Exercise sheet 5: Replication of a controlled experiment and data analysis
Preparation for the examination
(Submission of research design)

Tutor Michael Klaes

Location: Check lecture website

Prerequisites for Lecture

- **Vordiplom (or BS)**
- **Lecture „Foundations of Software Engineering“ (GSE)**
- **Programming Experience**
(e.g., 4th Semester Project Course)
- **Interest in (empirical) research in SE**
 - E.g., evaluation of Software Engineering technologies, methods, and tools

Background Literature

- Wohlin, Runeson, Höst, Ohlsson, Regnell, Wesslén (2012). **Experimentation in Software Engineering**. Springer
- Runeson, Höst, Rainer, Regnell (2012). **Case Study Research in Software Engineering**, Wiley.
- Juristo, N., and Moreno, A. (2001) **Basics of Software Engineering Experimentation**, Kluwer Academic Publishers.

Additional Resources:

- Bortz, J. and Döring, N. (2006). **Forschungsmethoden und Evaluation für Human- und Sozialwissenschaftler (4 Auflage)**. Berlin: Springer Verlag.
- Boehm, Rombach, Zelkowitz (Eds): **Foundations of Empirical Software Engineering – Legacy of Victor R. Basili**, Springer Berlin Heidelberg New York, 2005.
- Jedlitschka, A., Ciolkowski, M., Pfahl, D. (2008). **Reporting Controlled Experiments in Software Engineering**. In: Shull, F., Singer, J., Sjöberg, D.I. (Eds.). **Guide to Advanced Empirical Software Engineering**. Springer.

Specific Resources will be announced in the lectures

Slides

- Electronic Version of lecture slides will be available as PDF files:

<http://www.wagse.informatik.uni-kl.de/teaching/ese/ss2016>

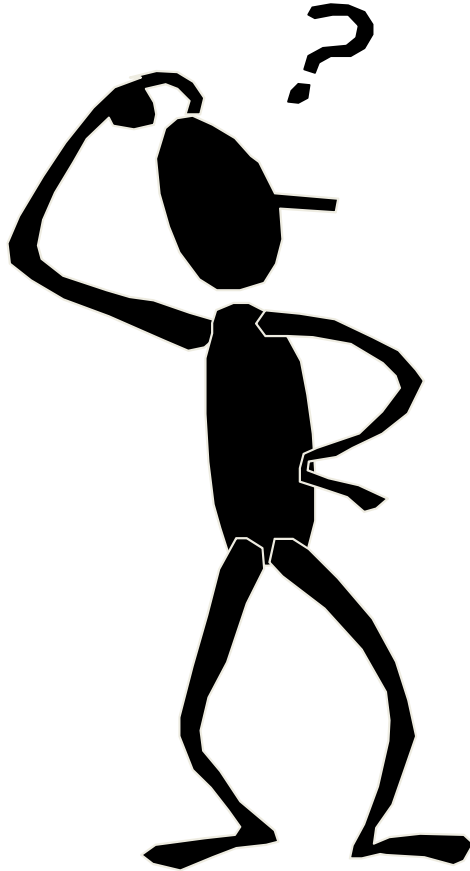
- **Active Participation in Exercise Classes:**
 - At the beginning of the semester, students will build teams of 2 – 3 members.
 - During the semester, each team will be responsible for:
 - Planning and designing an empirical evaluation of a software technology
 - Presenting their study design
 - Taking part in an empirical evaluation of a software technology and analyzing empirical data
 - The **planning and design of an empirical evaluation** (along with the submission of the corresponding reports) **during the semester time is mandatory for being admitted to take the exam and will count as semester accompanying deliveries** (in German: semesterbegleitende Leistungen).
- **The final examination will be announced**
 - **written examination**
 - Prerequisites for the final examination are a successful presentation as mentioned above and a regular active participation in exercise class.

Examination

- The duration of the **written examination** will be **80 minutes** (according to the credit points)
- **No material** to be used (just pen)
- **No mobile devices** etc. allowed

Date	Time	Room
26.07.2016 (Klausur)	09:30-10:50 (80min)	52-206
05.10.2016 (Nachklausur)	09:00-10:20 (80min)	46-110

Questions?



- **Meet Andreas Jedlitschka:**
before/after class or by appointment
email: andreas.jedlitschka@iese.fraunhofer.de
- **Meet Michael Klaes:**
before/after exercise or by appointment
email: michael.klaes@iese.fraunhofer.de
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