Secure Software Engineering

Winterterm 2025/26

Dr. Christian Tiefenau

whoami

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whoami |
Dr. Sergej Dechand

UNIVERSITÄT BONN

Security Researcher · Entrepreneur · Educator

🎓 Academic Background
- Computer Science: TU Braunschweig, Teesside (UK)
- 15+ years research & teaching
    - Uni Bonn, NII Tokyo, MPI Bochum
- Focus: Secure Software Development

🔬 Research with Impact
- AI-Based Security Testing for Java/Kotlin [1]
- 600+ vulnerabilities in critical OSS projects
- From research to industry application [2]

💼 Industry Experience
- Started as working student consulting dev teams
- Co-Founder of Code Intelligence (2018)
- Security testing tools in production use
- Now advisor in multiple software security startups

[1] Jazzer – Coverage-guided, in-process fuzzing for the JVM
[2] In collaboration with Google's OSS-Fuzz team

whoisteam

Lecturers:

Dr. Christian Tiefenau

Dr. Sergej Dechand

Tutors:

Aura Pop

Ekaterini Tiriakidou

Lukas Struck

eCampus

https://ecampus.uni-bonn.de/goto_ecampus_crs_3852727.html

Lecture

- When: Wednesday 10 c.t. -12

- Where: Hörsaal 7 and Online

- Based on the „Secure Software Engineering"-Lecture of Prof. Andy Meneely (RIT) and Prof. Eric Bodden (Uni Paderborn)
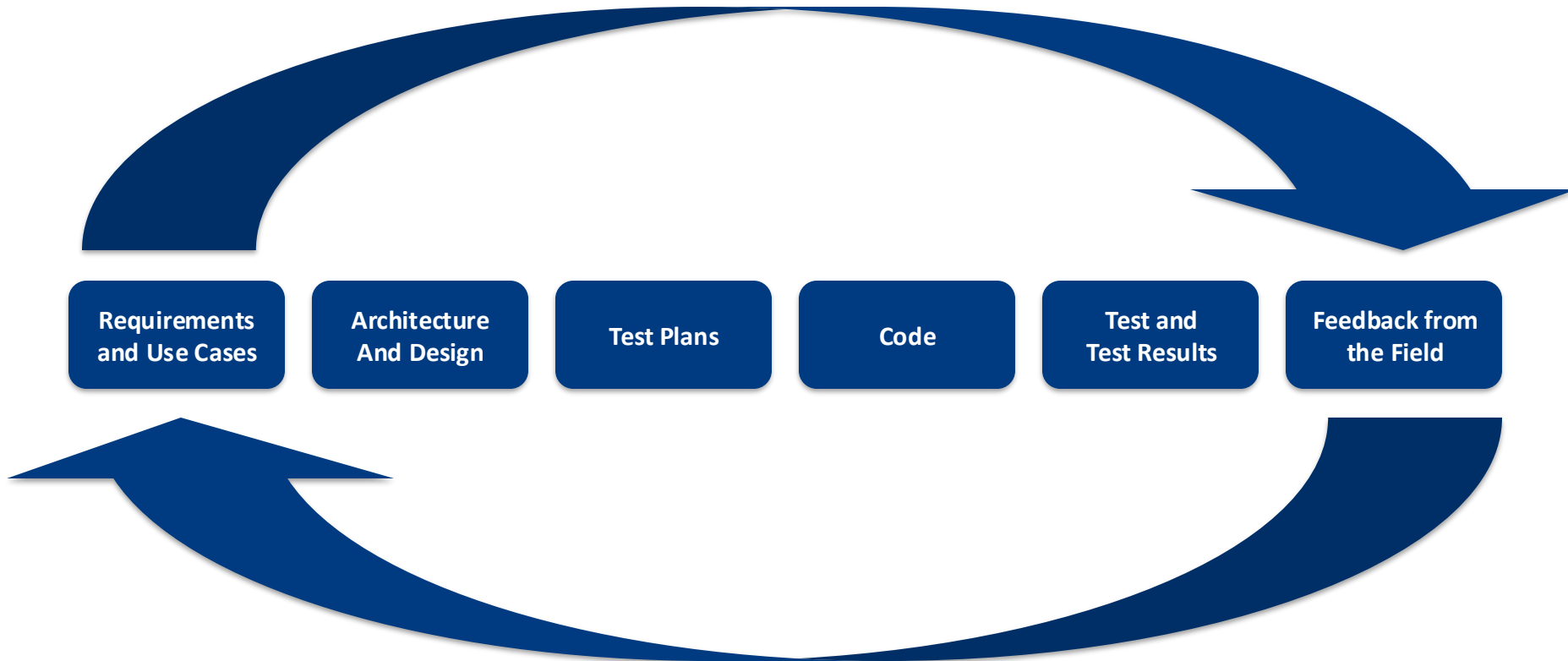
Lecture

- What are your expectations?

- If there are questions: Feel free to ask
  - Otherwise: Asynchronously on the eCampus-Forum

- If you are already an expert and miss topics here, tell us ☺

Lecture - Components

- ## Vulnerability of the Day
  - Presentation of several code-level vulnerabilites
  - How to spot, prevent and mitigate them
  - From the Common Weakness Enumeration (https://cwe.mitre.org)

- ## Secure Software Development Lifecycle (SDLC)
  - How can we prevent vulnerabilities with secure software design?
  - Presentation of the SDLC-elements

Lecture - Components 1

Lecture - Schedule

#	Datum	Topic
1	22.10.	Introduction
2	29.10.	Requirements, Misuse & Abuse Cases
3	05.11.	Risk Analysis & Distrustful Decomposition
4	12.11.	Risk Management & Test Planning
5	19.11.	Defensive Coding / Pitfalls
6	26.11.	Correct Usage of Security Mechanisms
7	10.12.	Code Reviews / Vulnerability Assessment
8	18.12.	Static/Dynamic Code Analysis
9	07.01.	Deployment
10	14.01.	Insider Threats
11	21.01.	TBA
12	28.01.	Usability + Recap

Exercise

Exercise

- There will be 10 optional exercise-sheets.
- 3 exercise dates (due to high demand)
  - Tuesday (14-16, Lukas, HS 3, 50 seats)
  - Thursday (10-12, Aura, HS 4, 50 seats)
  - Friday (12-14, Ekaterini, U1.027, 25 seats)

- Start: Next week (04.11.)
- Please re-register in TVS: https://puma.cs.uni-bonn.de

- Contents: Questions that may appear similarly in the exam

Exam

- Dates:
  - 18.02.26 + 23.03.26
- Content: Lecture + Exercises
- We will test the comprehension of the contents
  - Applying techniques to problems
  - You should be able to describe how and why, e.g., certain problems exist

Questions?