Practical Lab

Computer Systems Lab

https://github.com/TUM-DSE/sys-lab

Ilya Meignan--Masson
Prof. Pramod Bhatotia

Course instructors

Ilya Meignan--Masson

PhD student

Prof. Pramod Bhatotia

Professor

Systems Research Group

https://dse.in.tum.de/team/

Mentors

Martin Fink
PhD student

Sebastian Reimers
PhD student

Patrick Sabanic
PhD student

Teofil Bodea
PhD student

Dr. David Schall
Research group reader

Julian Pritzi
PhD student

Manos Giortamis
PhD student

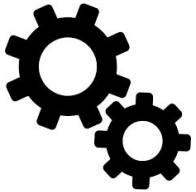
Peter Okelmann
PhD student

Jiyang Chen
PhD student

Computer systems lab (aka “sys-lab”)

Team
(~3-4 students per team)
advised by a mentor

Understand



Evaluate

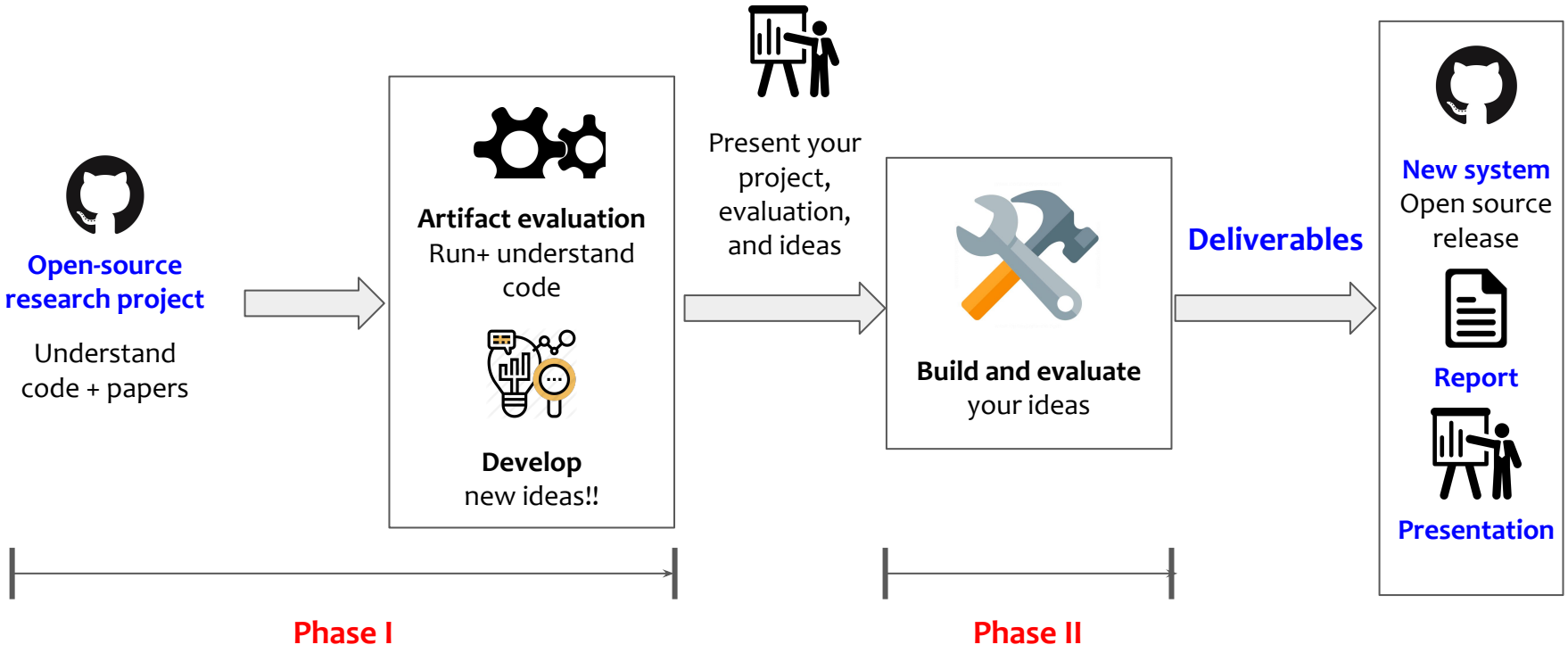
Generate ideas

Build on your ideas

sys-lab

Open source project
(state-of-the-art research topic)

Format


Open-source research project
Understand code + papers
Artifact evaluation
Run+ understand code
Develop
new ideas!!
Present your project, evaluation, and ideas
Build and evaluate
your ideas
Deliverables
New system
Open source release
Report
Presentation
Phase I
Phase II

Focus of this Lab

- State of the art open-source computer systems projects

- End-to-end system design and development
  - What is it? → Learn by understanding the system
  - How can we use it? → Learn by evaluating the system
  - What can be improved? → Learn by generating new ideas!
  - How to realise our ideas? → Learn by building the system

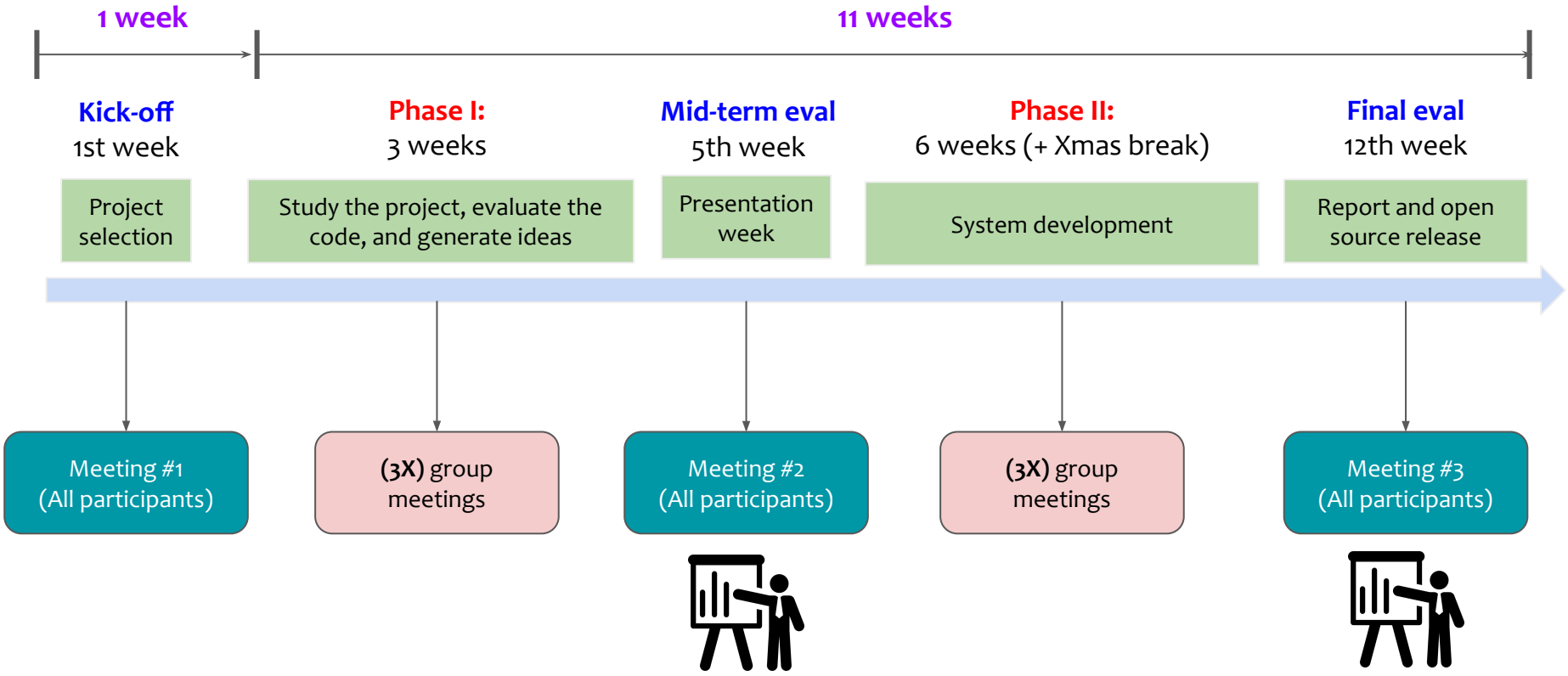
Tentative topics (WS 24/25)

Projects are based on the research themes at the chair

1. Quantum software systems (Manos)
2. Dynamic binary translation (Sebastian)
3. OS and Virtualization (Peter)
4. Accelerated computing systems and FPGAs (Jiyang)
5. Cloud security (Patrick)
6. Computer architecture + Serverless computing (David)
7. CXL memory systems / formal verification (Julian)
8. Hardware-security (Teofil)
9. Compiler + security (Martin)

IMPORTANT:
The exact list of projects will be provided in the first week

Timeline


1 week
11 weeks
Kick-off
1st week
Project selection
Phase I:
3 weeks
Study the project, evaluate the code, and generate ideas
Mid-term eval
5th week
Presentation week
Phase II:
6 weeks (+ Xmas break)
System development
Final eval
12th week
Report and open source release
Meeting #1 (All participants)
(3X) group meetings
Meeting #2 (All participants)
(3X) group meetings
Meeting #3 (All participants)

Dates

All participant meetings – **IN PERSON**	**Dates (Thu, 13:00h)**
Kick-off: Project selection	17th October 2024 (**13:00h-14:00h**)
Phase I: Mid-term evaluation	21st November 2024 (**13:00h-16:00h**)
Phase II : Final evaluation	30th January 2025 (**13:00h-17:00h**)

Group meetings	**Dates**
(3x) phase I group meetings	Directly organized with the team mentor
(3x) Phase II group meetings	Directly organized with the team mentor

Grading

Category	Details	Grade
Phase I: Artifact evaluation	Running and evaluating code by reproducing the results described by the authors	20%
Phase II: System building	Extending the system with your own ideas	40%
(2x) Presentations	Two presentations are due after each phase, audience participation is also graded	20%
Report + Open-source release	One report covering all aspects and reviewing reports of your peers	20%

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Report + Open-source release	One report covering all aspects and reviewing reports of your peers	20%
Pull-requests	**Successful pull requests to the project**	**20% (BONUS)**

Organization

- **Project-based course (~4 students per team) advised by a Team Leader**
- **Meetings:**
  - **3x** all participant meetings
  - **6x** group meetings (with the team mentor)
- **Communication:**
  - Slack: course channel for announcements and group channel for the team work
- **Format:**
  - **Meeting #1: Kick-off** -- project selection, team formation, and next steps
  - **Meeting #2: Intermediate presentation** covering overview, evaluation, and new ideas!
  - **Meeting #3: Final presentation** covering your final contributions (demo, code, & report)

Learning goals

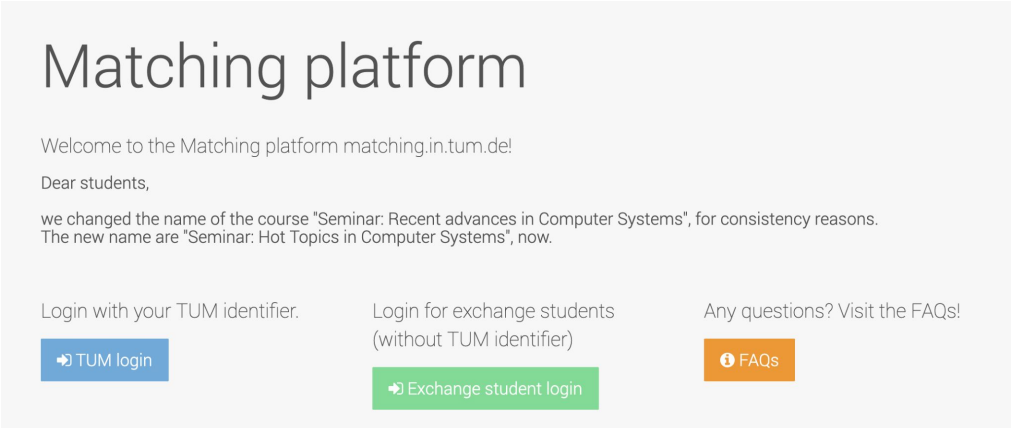
- Our goal is to have fun breaking and hacking computer systems
- Learn about cutting-edge research in computer systems
- Cultivate an environment for innovation and collaboration
  - Pushes the boundaries of the state of the art
  - Contributing to ongoing open-source research projects
- Communication: presenting your work to your peers and giving constructive feedback to improve other's work
- Reproducibility: delivering your work such that others can build on it

Code of conduct

- University plagiarism policy
  - https://www.in.tum.de/en/current-students/administrative-matters/student-code-of-conduct/

- Decorum
  - Promote freedom of thoughts and open exchange of ideas
  - Cultivate dignity, understanding and mutual respect, and embrace diversity
  - Racism and bullying will not be tolerated

Interested?



Sign up on the TUM matching platform

Contacts

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- Prof. Pramod Bhatotia
  - pramod.bhatotia@tum.de

  - **All course information:** https://github.com/TUM-DSE/sys-lab

Workspace: http://ls1-courses-tum.slack.com/

Channel: #ws-24-sys-lab

Join us with TUM email address (@tum.de)