PADERBORN UNIVERSITY

Project Group Presentation

Winter Semester 2025/26

Computer Science & Computer Engineering (Master)

Lecture hall O1 and seminar room O1.224

Jan-Luca Hansel

July 21st, 2025

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Presentation session (CS & CE)

Time	Lecture hall O1	Seminar room O1.224
16:15	Project groups, registration and requirements	
16:35	Mixed project groups (6)	
17:30	CS project groups (2)	CE project groups (4)

- Each advisor will present their project group in a short presentation (10 min)
- Questions are not allowed

Discussion sessions for each project group (all take place simultaneously)

Time	Lecture hall O1	Seminar room O1.224
17:50	CS and mixed project groups (8)	
18:10		CE project groups (4)

- If you plan to take part in a group in Winter Semester 2025/26, **please stay**!
- **Individual discussions** in groups with the students and the advisors.
- Build small groups for questions, discussion, declare personal interest.

Mixed Project Groups (2×10 ECTS, 2×9 ECTS)
accept both Computer Science and Computer Engineering students

CS Project Groups (2×10 ECTS)
accept Computer Science students

CE Project Groups (2×9 ECTS)
accept Computer Engineering students (and EE students, not the concern today)

Mixed Project Groups (2×10 ECTS, 2x9 ECTS)		O1
16:35	**Machine Unlerning for Face Recognition** Responsible AI for Biometrics	
16:45	**Hardware/Software Co-Design of Distributed Robotics Systems** Computer Engineering Group	
16:55	**Knowledge Graph Summarization** Data Science	
17:05	**VR-Serious: Seated Locomotion for VR Serious Games** Software Innovation Lab + GamesLab	
17:15	**Adaptive Authentication in Virtual Reality** IT Security	
	Supplychain attack and defense platform Empirical Software Engineering	– will not be presented –

CE Project Groups (2×9 ECTS)		O1.224
17:30	**Simulating Robots with Differentiable Simulation** Automatic Control Group	
17:40	**Fusing EEG and wearable data** Signal and System Theory	
17:50	**gym-electric-motor: electric drive simulation and control in Python** Power Electronics and Electrical Drives	
18:00	**Design and development of aerial soft robots in Isaac sim** Automatic Control Group	

CS Project Groups (2×10 ECTS)		O1
17:30	**Classifying Graph Orbits under r-Local Complementation** Quantum Information	
17:40	**FOX: Framework for Offensive eXercises** System Security	

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What are project groups?

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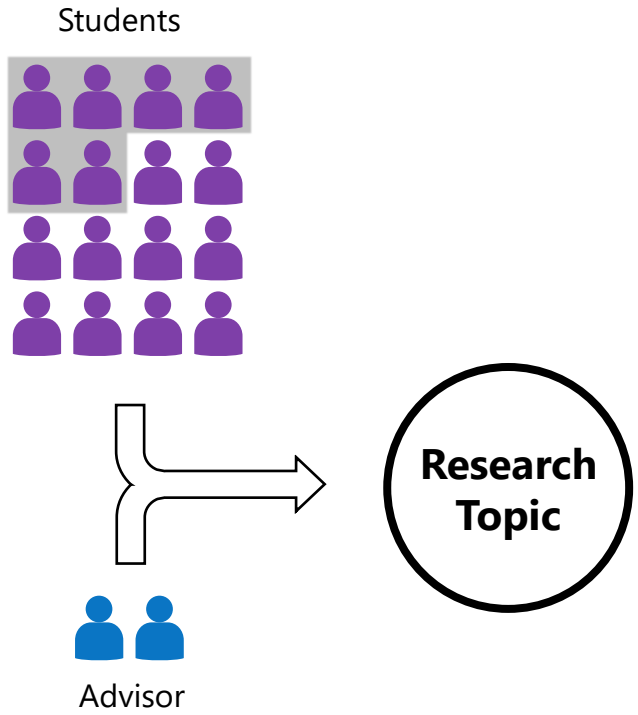
Definition

Group of about 8–16 students working together on a *research-related project*

- Upper limit of 16 holds for all groups
- Lower limit may be 6 in particular situations
- Research topics come from the advisor's field of interest
- Duration: **one year** (two semesters)



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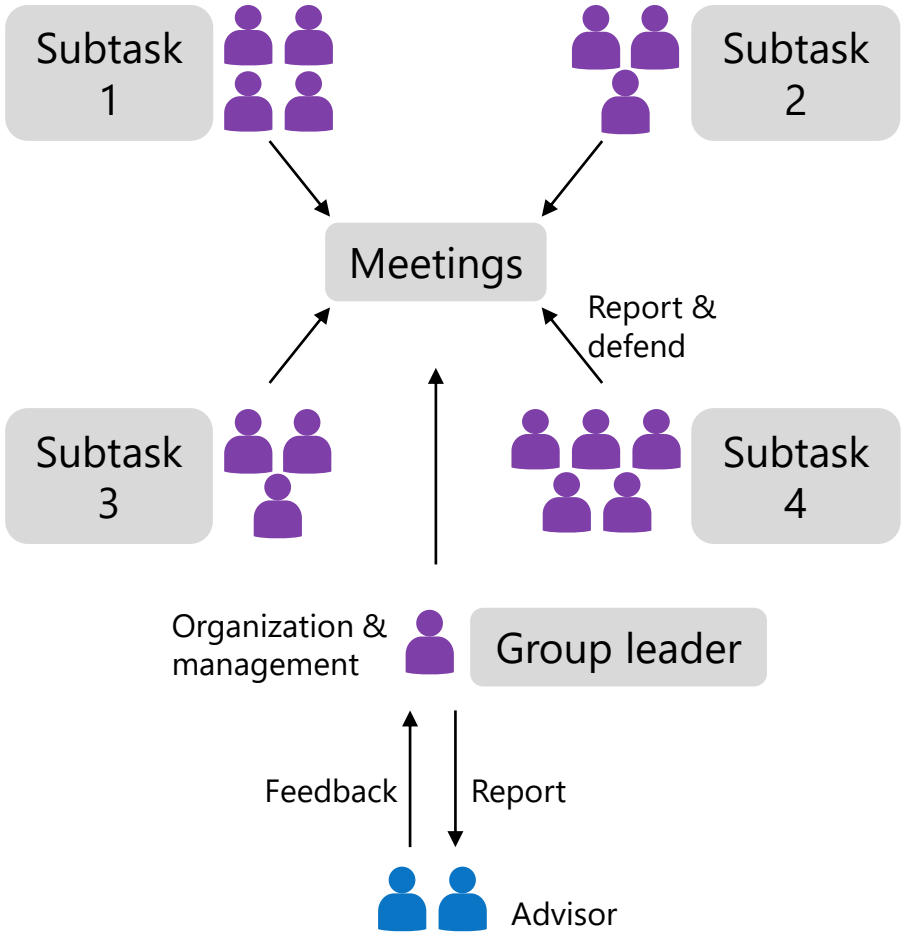
Organization

You shall gather practical experience in **teamwork** and **organization** of a project

- Build your own **personnel structure**, similar to teams in the industry
- **Delegate** of subtasks and responsibilities to subgroups

Division of tasks involves

- the necessity to **report** about your work at regular intervals and
- to **defend** your own work



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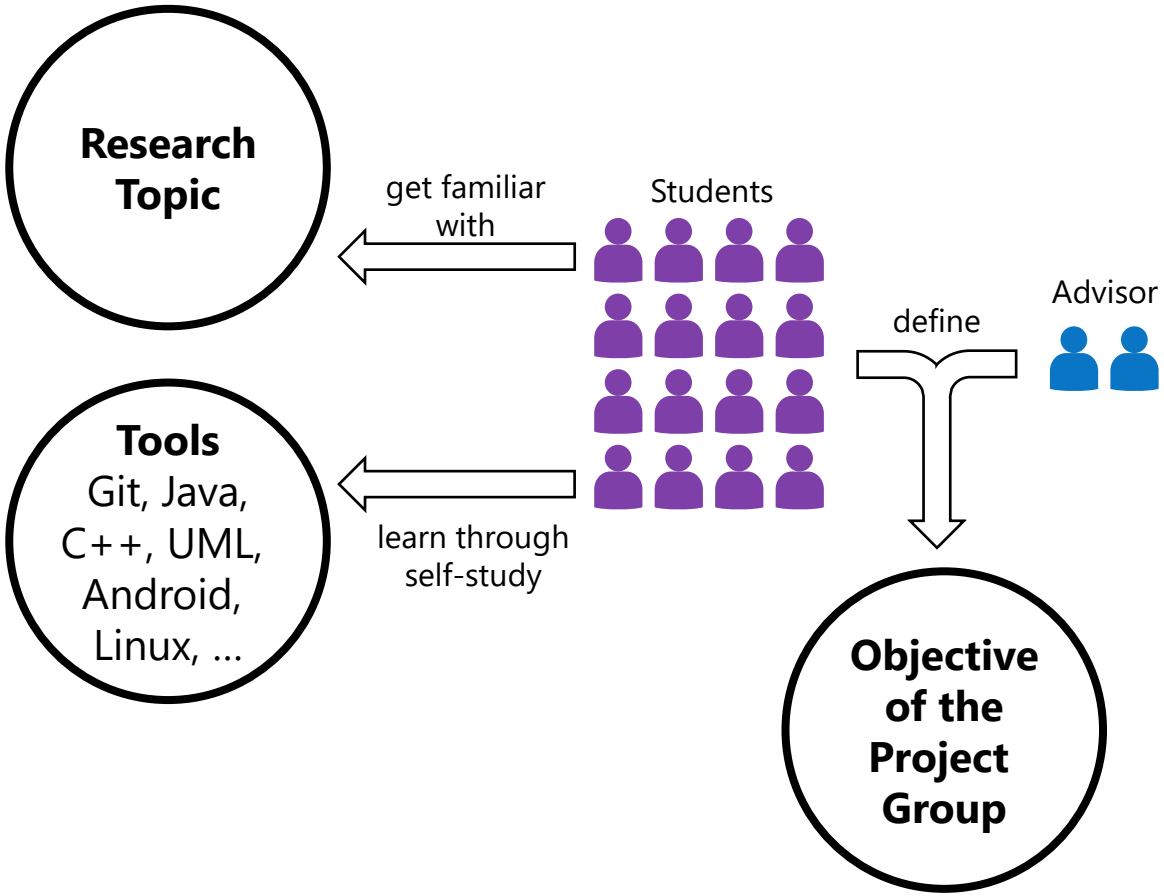
Organization

Self-organization

- **Define the aims** on your own together with the advisors
- **Become proficient** with necessary tools, methods and approaches **on your own**



Outcome

Your outcome

- You learn to work systematically and methodically
- You experience a comprehensive development processes (including final report and documentation)
- You will be intensively prepared for work in the industry
- You approach current research topics
  - » Oftentimes, students write their **master's thesis** in the same field and research topic

Your advisor's outcome

- Project groups are a means for research
- Implementation and execution of research

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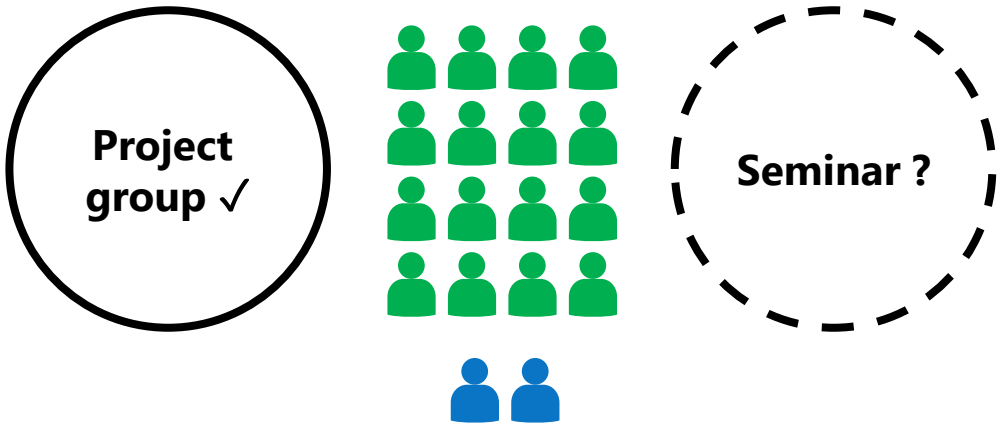
Seminar as a parallel course

- The organizer can provide a seminar parallel to the project group
- The seminar is a **separate course**
- The organizer determines whether participation is **mandatory or optional**
- The organizer decides whether such a seminar is available or not

Please note the announcements of the organizer



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Requirements for participation

You may only participate in a project group if…
- **you successfully completed your bachelor's degree** and
- your enrollment into your master's program has been completed

Your **bachelor's degree** is **successfully completed** if
- all examinations have been passed and
- your thesis' 4.0 confirmation has been handed over to the examination office
  - by **March 31st** (for project groups starting in a summer semester) or
  - by **September 30th** (for project groups starting in a winter semester)

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Requirements for participation

You may only participate in a project group if…
- you successfully completed your bachelor's degree and
- **your enrollment into your master's program has been completed**

- Students of the bachelor's program who complete their degree only on March 31st or September 30th must therefore enroll for the Master's program **by September 21st**
- You can submit proof of the successful completion of your studies (Bachelor's certificate or similar) **by October 23rd**

- **Check the dates on the university website!**
  - https://www.upb.de/zv/3-3/formalitaeten/studiengangwechsel/uebergang-bachelormaster
  - https://www.uni-paderborn.de/zv/3-3/bewerbung-immatrikulation/fristen

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Application via e-mail

Bachelor Students who cannot apply electronically via PAUL due to a missing master status register as follows during of **Phase 1**:

To:	paul@upb.de
CC:	mafi@upb.de
Subject:	Anmeldung „All Project Groups Winter Term 2025/26“
Body:	Hallo, Ich möchte mich zu diesem Kurs anmelden: „L.079.07099 All Project Groups Winter Term 2025/26“. Name: **your name** Matrikelnummer: **your matriculation number** Uni-E-Mail: **your university e-mail address** IMT-Beutzername: **the username of your imt account** Studiengang: **your study program, either CS or CE**

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The assignment process

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Overview

Phase 1: PAUL registration

August 15th–August 21st (timely registration)
August 22nd–September 22nd (late registration)

Phase 2: Assignments & Preferences

August 23rd–September 15th

Phase 3: Stable Marriage

September 23rd

Phase 4: Result's Notification & Decision

September 29th (PAUL registration done by administration & e-mail notification)

Grading: September 16th–September 22nd

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Phase 1 – PAUL registration

- You register only for one course:

L.079.07099 All Project Groups Winter Term 2025/26

- The course captures the registration for all project groups
- Here, you cannot choose your preferred group!
- You can see all project groups in the course catalogue, but you cannot register for them

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Phase 1 – PAUL registration

Timely registration

You will receive a project group/seminar in any case

You can start Phase 2 on time

Late registration

- The PAUL registrations are only synchronized once per week with the Jupyter server
- If you register in PAUL **during Phase 2** (Assignments & Preferences), …
  - you can complete all assignments and preferences, but
  - you may miss interview appointments that scheduled for Phase 2 (does not apply to all organizers)
- If you register in PAUL **after Phase 2**, …
  - you will not be able to do any assignments and thus be graded to the lowest rank in the grading of all organizers, but
  - you can still set your preferences in any case, this will be possible until the beginning of Phase 3 (Stable Marriage)

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Phase 1 – PAUL registration

Registration in PAUL is only possible if the **re-registration (matriculation renewal)** for the winter semester has been completed before then!

- The re-registration is done by paying the enrollment fee
  - https://www.upb.de/zv/3-3/formalitaeten/rueckmeldung

- Bank transfer **takes a few days**
- The university's administration also **takes a few days** to book the money
- Registration for project groups is only possible once both have been completed

We highly recommend that you re-register and renew your matriculation, i.e., pay the enrollment fee **now!**

(**CE students**: The one-week registration phase is only valid for project groups of EE organizers participating in this procedure. This does not apply to other project groups of EE organizers!)

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Phase 2 – Assignments & preferences

Step 1

Students state the preferences for all project groups, not just a subset or the ones you like!

- You do not need to participate in a project group you don't like

Step 2

Project group advisors provide **assignments**

- Used to test student's suitability for a given project group
- Students fill in these assignments for the project group they are interested in

An assignment can be…
- empty (e.g., if the organizers do not require a precondition for participation),
- a programming assignments,
- a questionnaire with free-text answer fields or
- a placeholder for a personal interview

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Phase 2 – Assignments & preferences

Where can I find these assignments?
- Starting on August 23rd, you can log onto our Jupyter server at https://pg.cs.upb.de

What if I decide not to participate in any project group while the assignment phase is running?
- Please deregister from “L.079.07099 All Project Groups Winter Term 2025/26” in PAUL!

How many assignments should I hand in?
- We recommend to do at least 3 assignments, 4–5 might be even better
- Of course, you can always hand in even more assignments

What if I want to update what I handed in?
- You may submit an assignment as often as you like, in the end, the latest version counts

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Phase 2 – Assignments & preferences

What if I only submit the assignment for one project group?

- This only works for students who are better than most of the other people who submitted that assignment
- In general, this is a very bad idea and not recommended

Example from a past seminar allocation:

- A student submitted only the assignment for the seminar they valued with preference 1
- As 15 other students had a better score than them, the algorithm did not allocate them to the seminar they valued with preference 1
- Because they submitted no other assignments, they were allocated to their lowest preference, a seminar with preference 11

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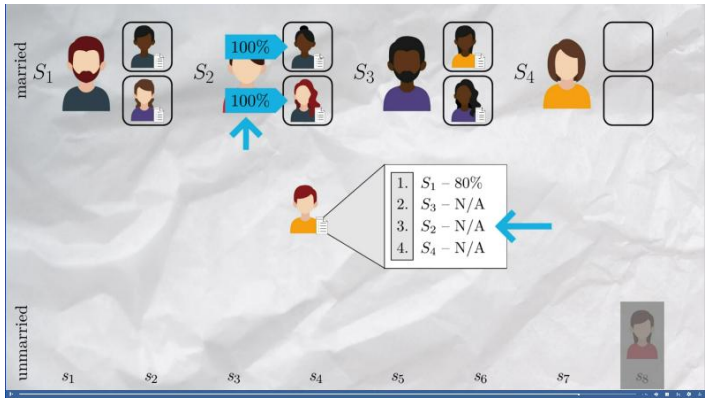
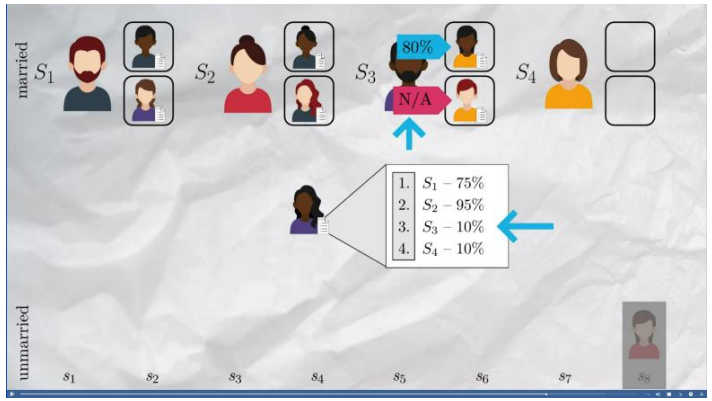
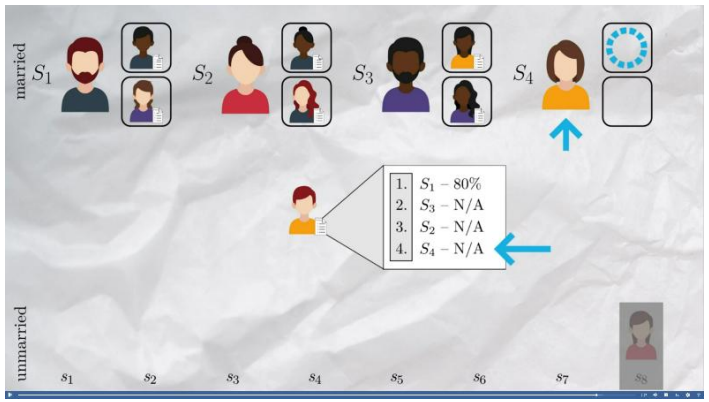
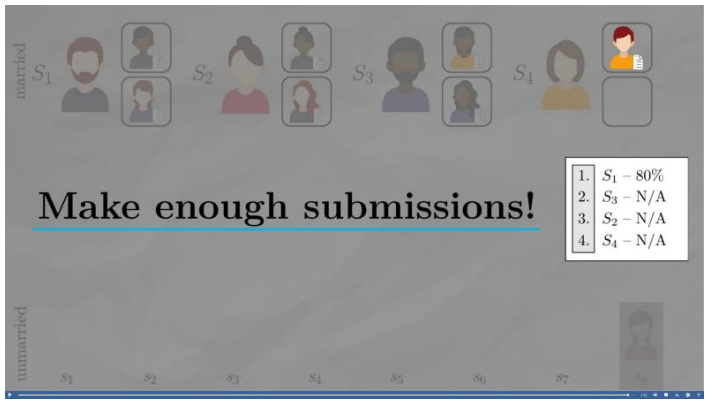
Phase 2 – Assignments & preferences









On our website, you will find a video that explains the algorithm and shows the consequences of filling out too few assignments

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Phase 3 – Stable marriage

- The project group advisors score the assignments of the students with points
- The more points a student gets from the advisor, the greater the chance of a project group seat

Scores rank students from the project groups advisors' perspective

Preferences rank the project groups from the students' perspective

Now, we apply the Stable Marriage algorithm

- Based on both, we compute a stable marriage which matches students to project groups
- The project group allocation is **not random**
- Each student gets a project group!

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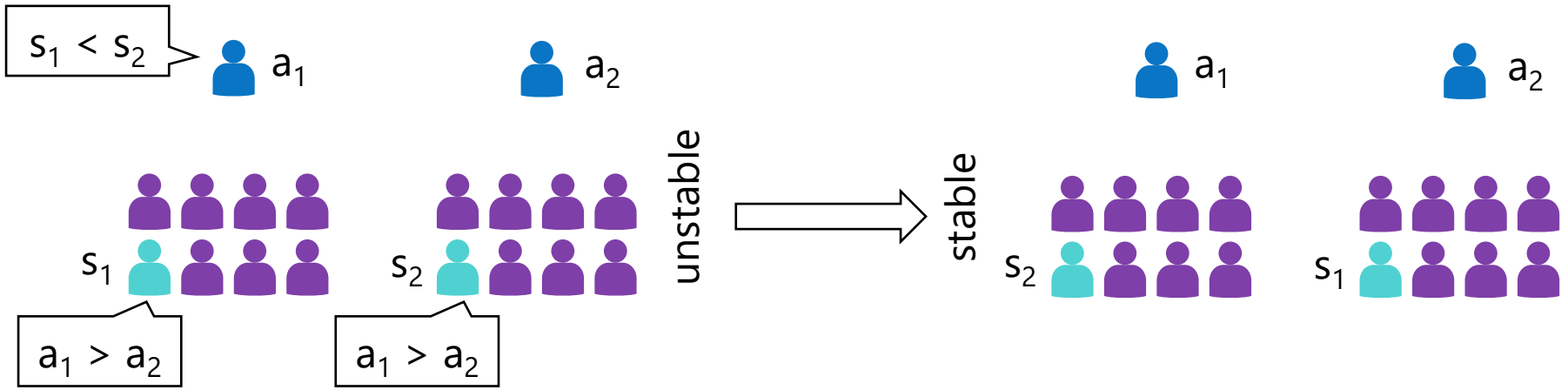
Phase 3 – Stable marriage

Stable Marriage – Wikipedia

A matching is a mapping from the elements of one set [*A*] to the elements of the other set [*B*]. […]
[A] matching is stable when there does not exist any pair (*A*, *B*) [in] which both prefer each other to their current partner under the matching.



The stable marriage algorithm is a deterministic algorithm!

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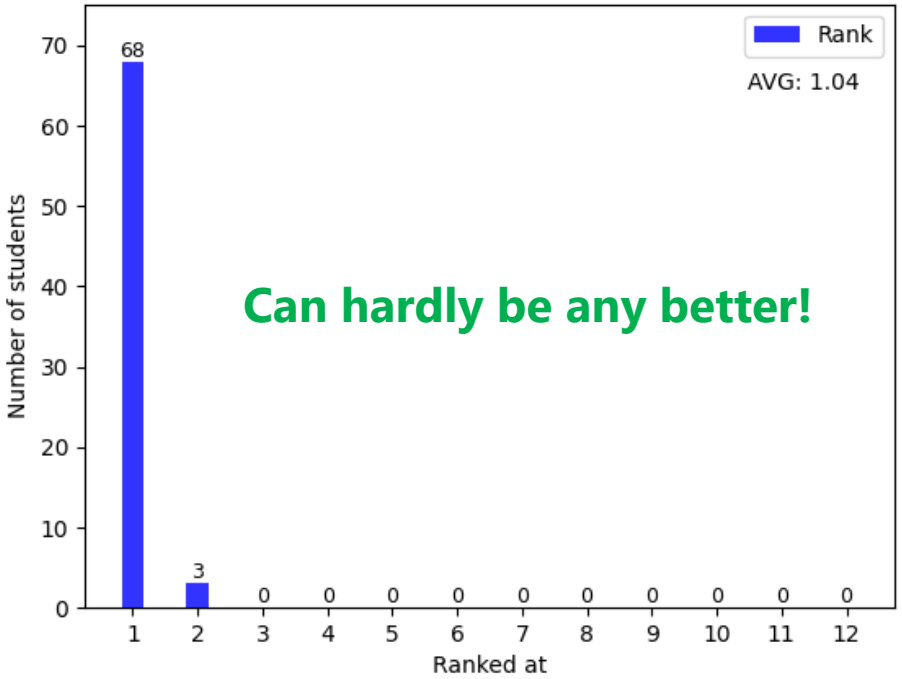
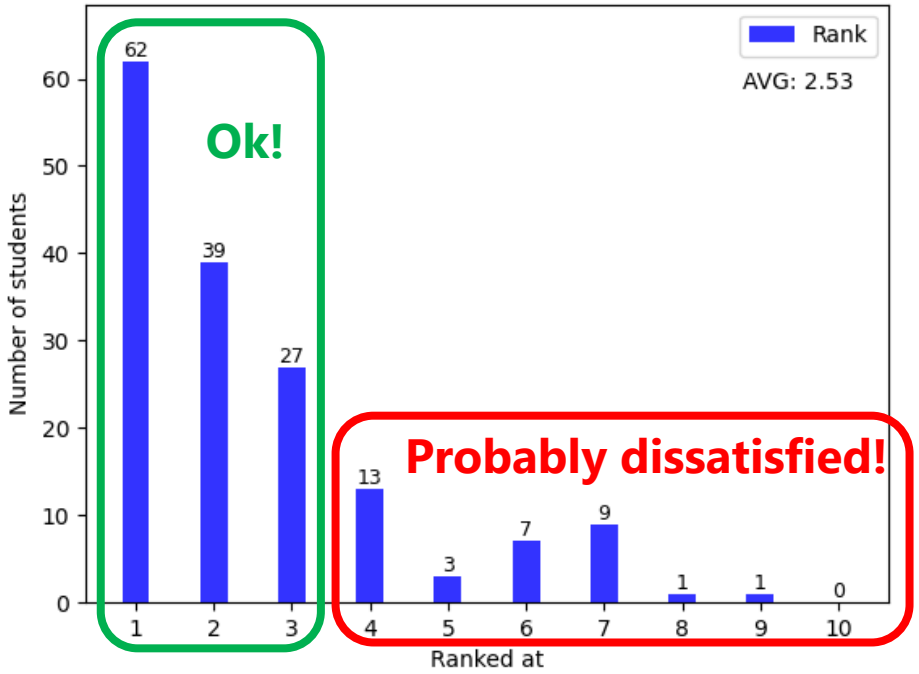
Phase 3 – Stable marriage

- An allocation only creates satisfaction if the demand is evenly distributed over what's offered
- If too many students prefer the same project group, not all of them will be able to get their preference 1!

Project Groups (2022/2023)



Seminars (Summer 2022)



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Phase 4 – Notification & decision

- The students are informed which project group they have been assigned to (via PAUL and Jupyter)
- The final result will be entered into PAUL **by the PAUL staff**
- Students move from “L.079.07099 All Project Groups Winter Term 2025/26” to the course they have been assigned to

What if I don’t like the project group I have been assigned to?

- Deregister from your assigned course in PAUL

Option 1

- You start another project group in the following semester

Option 2

- The project groups are open for PAUL’s Revision Phase (October 1st–October 31st) where the remaining spots will be available
  - You may directly register in PAUL for such a project group

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More information, web pages, links, PDF files, …

Main web page for project groups: http://www.upb.de/cs/pg

- List of all project groups with links to the individual project groups' web pages
- Information of the registration and notification process
  - https://cs.uni-paderborn.de/studium/projektgruppen/zuordnungsverfahren
  - https://cs.uni-paderborn.de/en/studies/project-groups/matching-method

Guidelines for project groups ("Rahmenrichtlinien für Projektgruppen")

Good luck with your project groups!