Project Group Presentation
Winter Term 2024/25
Computer Science & Computer Engineering (Master)

Matthias Fischer

- Monday, July 22nd, 4:15 pm,

- Lecture hall: O1 (and O1.258)

Agenda

Single Session for all Students CS & CE (<u>**lecture hall: O1**</u>)

16:15   Why Project Groups?   Registration and Requirements

16:35   CS Project Groups (3)

17:05   Mixed Project Groups (6)

17:55   CE Project Groups (1)

- Each advisor will present his project group in a short presentation (approx. 10 minutes).

- The presentations will take place immediately one after the other, questions are not allowed.

Discussion Sessions (multiple, all take place simultaneously)

approx. 18:05   (after ALL presentations)

- If you plan to take part in a group in Winter Term 2024/25, **please stay**!

- **Individual discussions** in groups with the students and the advisors.

- Build small groups for questions, discussion, declare personal interest.

Mixed Project Groups (2x10 ECTS, 2x9 ECTS)

accept both Computer Science and Computer Engineering students

CS Project Groups (2x10 ECTS)

accept Computer Science students

CE Project Groups (2x9 ECTS)

accept Computer Engineering students (and EE students, not the concern today)

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CS Project Groups (2x10 ECTS)

16:35 **AI-supported Security Testing**
Secure Software Engineering

16:45 **Contrastive Explanations for Knowledge Graphs**
Data Science

16:55 **Explaining Graph Neural Networks**
Data Science Junior Research Group

Mixed Project Groups (2x10 ECTS, 2x9 ECTS)

17:05 **Building a Face Recognition Demonstrator**
Responsible AI for Biometrics

17:15 **Adaptive Retrieval Augmented Generation**
Data Science

17:25 **Quantum Networks Transformation**
Quantum Information

17:35 **Sustainable Internet-of-Things**
Computer Networks

17:45 **Programmable Matter 4**
Theory of Distributed Systems

Usable Security and Privacy Lab will be presented on a separate date !
IT Security (probably on 8 August at Fürstenallee 11)

Immersive Digital Twin-Driven Systems and Software Engineering
Software Innovation Lab will not be presented
Enes Yigitbas & Stefan Sauer please contact Enes Yigitbas ! https://cs.upb.de/dbis/lehre/projektgruppe-idt-sse

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CE Project Groups (2x9 ECTS)

17:55	**Machine Learning and Signal Processing Using EEG and Smartwatch Data** Signal and System Theory Group	
	Vision-based coordination of UAVs with Multi-Agent Reinforcement Learning Automatic Control Group	Project Group is cancelled, postponed to next summer term
	MoreGRIP-V System and Circuit Technology Wolfgang Müller	will not be presented please contact Wolfgang Müller !

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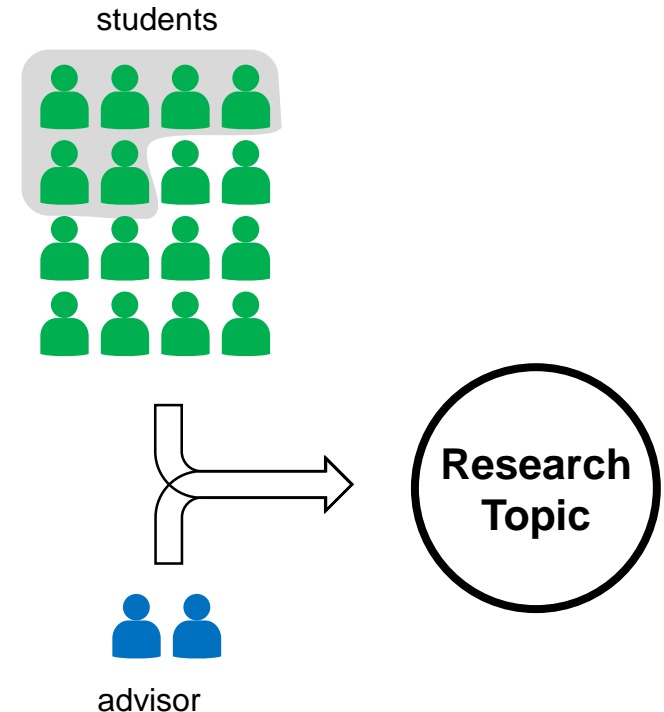
Definition
Project Group

Group of about 8 – 16 students
working together on a <u>research-related project</u>

- Upper limit 16 holds for all groups!

- Lower limit 6 in particular situations!

Research topics
from the advisor's field of interest

Duration: **one year** (two terms)

students

Research
Topic

advisor

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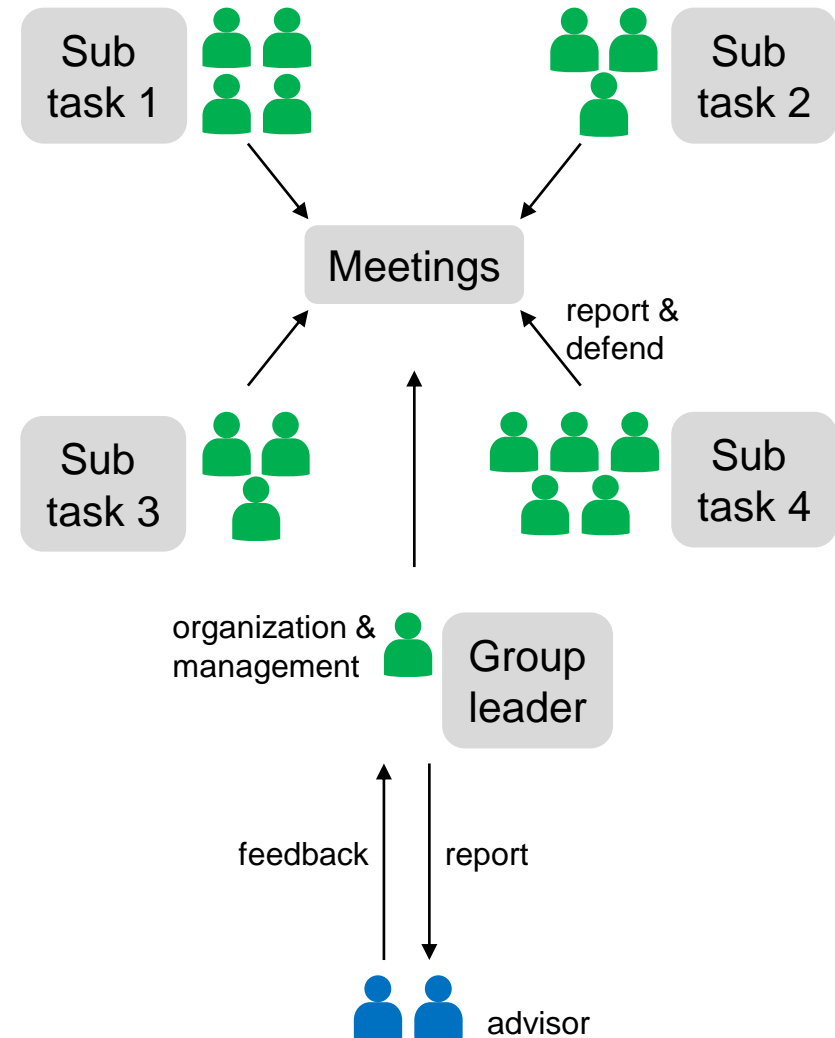
Aims: Improvement of character building (1/2)
Project Group

Practical experience in
teamwork and **organization** of a project

- Build your own **personnel structure**, similarly to an industrial team

- **Delegation** of sub tasks and responsibilities to subgroups

Division of tasks involves

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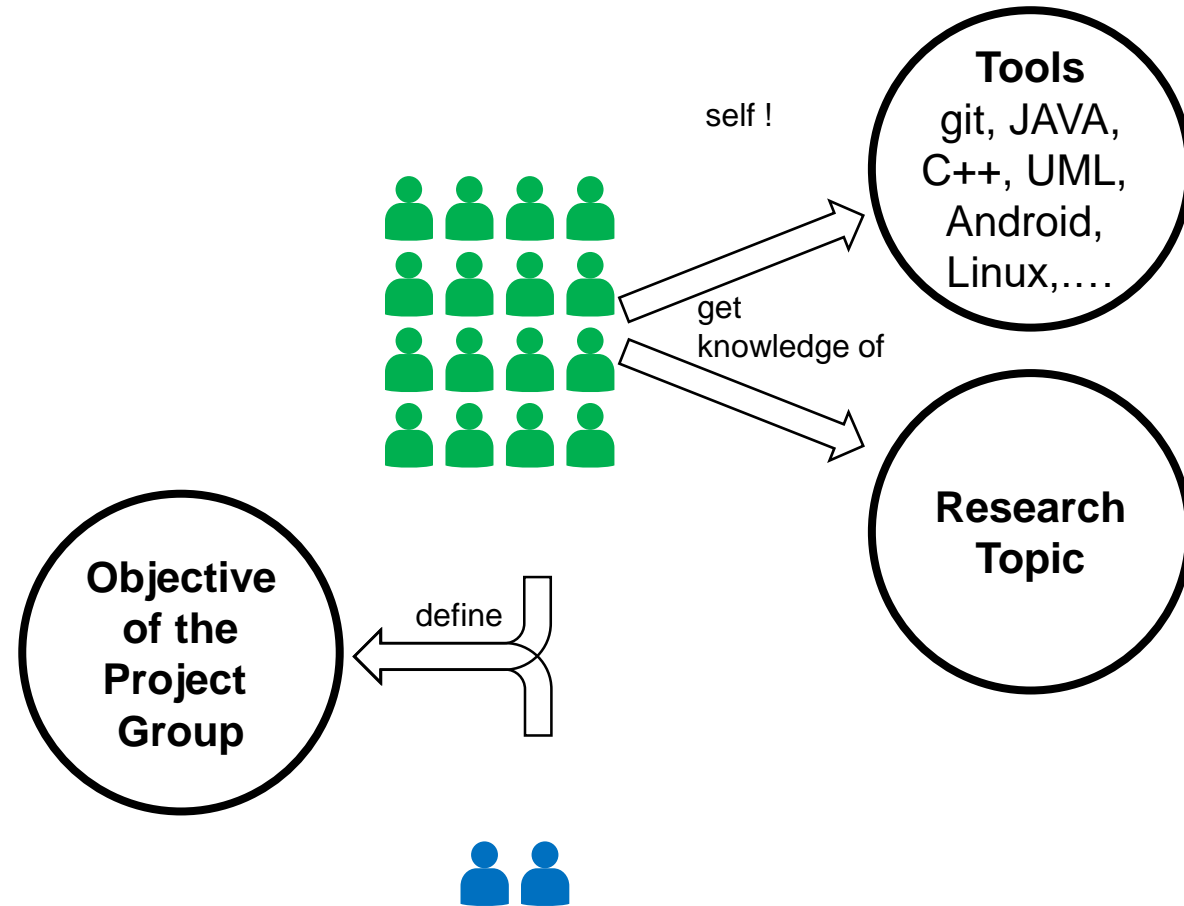
- and to **defend** the own work

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Aims: Improvement of character building (2/2)
Project Group

Self-organization

- **Define the aims** on your own together with the advisors

- **Self training** with necessary tools, methods and approaches

self !

Tools
git, JAVA, C++, UML, Android, Linux,....

get knowledge of

Research Topic

Objective of the Project Group

define

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Outcome
Project Group

Your our outcome

You learn

- systematic and methodic working

- comprehensive development processes (including final report and documentation)

You

- will be intensively prepared for industrial practice

- approach current research topics

   (often students write their **master's theses** in the same field and research topic)

Advisor's outcome

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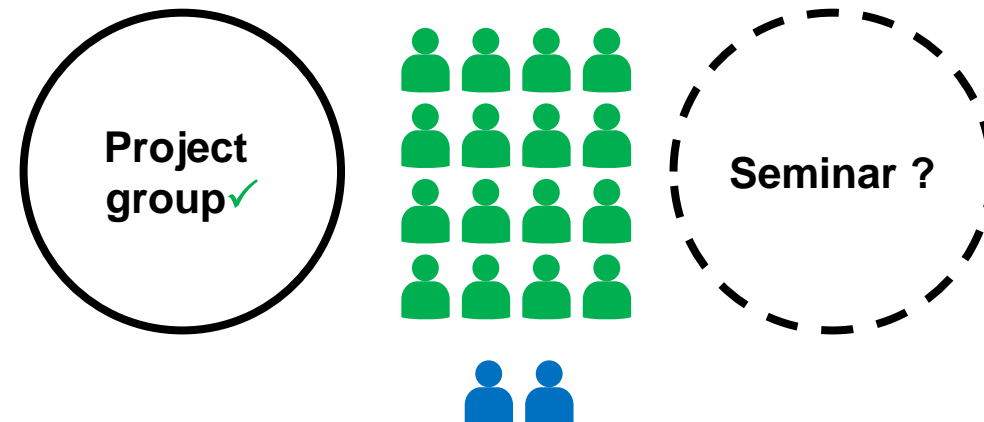
- Implementation and execution of research

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Seminar
Project Group

Seminar as parallel course

- the organizer can provide a seminar parallel to the project group

- the seminar is a <u>separate course</u>

- the organizer determines whether participation is <u>mandatory or optional</u>

- the organizer decides whether such a seminar is <u>available or not</u>

Please note the announcements of the organizer

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Requirements for Participation
Project Group

Project group can only be started
→ when the **bachelor's degree** has been successfully **completed**

Bachelor's degree is successfully **completed**, when

- all examinations have been passed and

- the thesis' 4.0 confirmation is handed over to the examination secretariat (Lessmann, Guhlich,…)

    - by 31 March (PGs starting summer term) and

    - by 30 September (PGs starting winter term)

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Requirements for Participation
Project Group

Project group can only be started
→ when the **enrollment in the master's program** has been **completed**

Students of the bachelor's program,

- who reach the 4.0 confirmation or examinations only on 31st of March, or on 30th of September,

- must therefore <u>enroll for the Master's program</u>
  in the relevant period of the change of studies (by 21 September, see uni webpage!)
  https://www.upb.de/zv/3-3/formalitaeten/studiengangwechsel/uebergang-bachelormaster

- you can submit proof of successful completion of your studies (Bachelor's certificate and deed or a corresponding certificate from the office responsible for issuing the deed)
  by 23 October, see uni webpage!
  https://www.upb.de/zv/3-3/formalitaeten/studiengangwechsel/uebergang-bachelormaster

Bachelor Students who cannot apply electronically via PAUL due to <u>missing master status</u> register as follows in the period of **Phase 1**:

Send e-mail to:	To: paul@upb.de CC: mafi@upb.de
Subject:	"Anmeldung All Project Groups Winter Term 2024/25"
E-mail body:	Hallo, ich möchte mich zu diesem Kurs anmelden: "L.079.07099 All Project Groups Winter Term 2024/25"

Name: ???   Matrikelnummer: ???   Uni-E-Mail: ???
IMT-Benutzername: ???   Studiengang (CS/CE): ???

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How to Get a Project Group
Method to Match Students to Project Groups

Method consist of 4 phases:

- **Phase 1:** PAUL registration
  August 12 - August 18 (timely registration)
  August 19 - September 22 (late registration)

- **Phase 2:** Assignments & Preferences
  August 20 - September 15

- **Phase 3:** Stable Marriage
  September 23

- **Phase 4:** Result's Notification & Decision
  September 27 (PAUL registration by administration & email notification)

- Advisor final grading: 17 - 20 September
  Autograding: 16 September

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How to Get a Project Group
PAUL registration

Phase 1 – PAUL registration

■ You register only for one <u>course</u>:
   "**L.079.07099 All Project Groups Winter Term 2024/25**"

■ The course captures the registration for <u>all project groups</u>,
   here you <u>cannot</u> choose your preferred group!

■ You can see all project groups in the Course Catalogue,
   but you can't register for them

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How to Get a Project Group
PAUL registration

"**Phase 1: PAUL Registration**" consists of two registration periods
directly following each other.

Timely registration
- You will receive a project group/seminar in any case
- You can start Phase 2 on time

Late registration
- You will receive a project group/seminar in any case
- the registration in PAUL is only synchronized once a week with the access to Jupyter
- If you register in PAUL during Phase 2 (Assignments & Preferences)
  - you can complete all assignments and preferences
  - late access to Jupyter may cause you to miss interview appointments that were scheduled in Phase 2 (applies only to organizers who are conducting interviews)
- If you register in PAUL after Phase 2
  - you will not be able to do any assignments and
    you will be graded to the lowest rank in the grading of all organizers
  - but you can still set your preferences in any case,
    this will go until the beginning of Phase 3 (Stable Marriage)

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How to Get a Project Group
PAUL registration

Registration in PAUL is only possible

- if the re-registration (renewal of matriculation) 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

Please note!

- 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 therefore 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 PGs of ET organizers participating in this procedure. This does not apply to others PGs of ET organizers!)

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How to Get a Project Group
Assignments & Preferences

Phase 2 – Assignments & Preferences

Consist of 2 steps:

Step 1

- Students state the <u>preferences</u> for <u>all</u> project groups

- All means all and not just 1 or 2 or just the one you like!

Do students have to participate in a project group they do not like?
→ No! See below

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How to Get a Project Group
Assignments & Preferences

Phase 2 – Assignments & Preferences

Consist of 2 steps:

Step 2

- Project group advisors provides an "assignment"

- Used to test student's suitability for a given project group

- Students fill in these assignments for the project group they are interested in

Assignment can be

- Empty (e.g., if the organizers do not require a precondition for participation)

- Programming assignments

- Free-text answers

- Placeholder for a personal interview

- … or whatever the organizer needs

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How to Get a Project Group
Assignments & Preferences

Phase 2 – Assignments & Preferences

Consist of 2 steps:

Both Steps

- Where? → Tool chain by Jupyter and nbgrader extension
- You can log in starting on 20 August   https://pg.cs.upb.de

What if I decide not to participate in any PG while the assignment phase is running?

→ Deregister in PAUL L.079.07099 All Project Groups Winter Term 2024/25 !

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How to Get a Project Group
Assignments & Preferences

For how many project groups should I take the assignments?

- Recommendation: Minimum: 3   Better: 4 - 5

- More than five?   → May be waste of time, but you can do

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

- Only for students who are better than all others in the desired project group
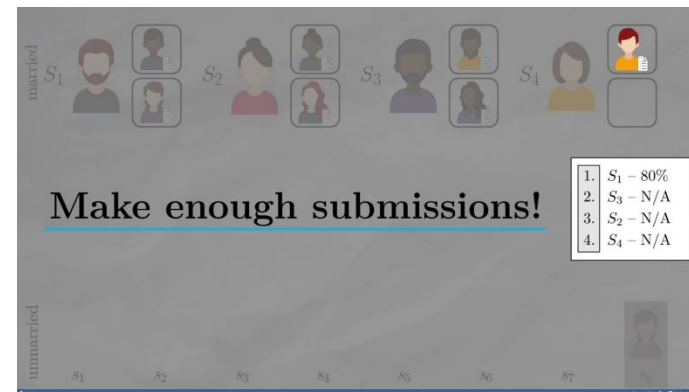
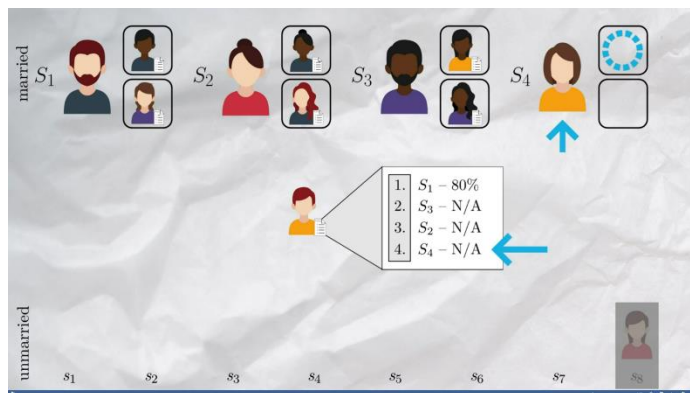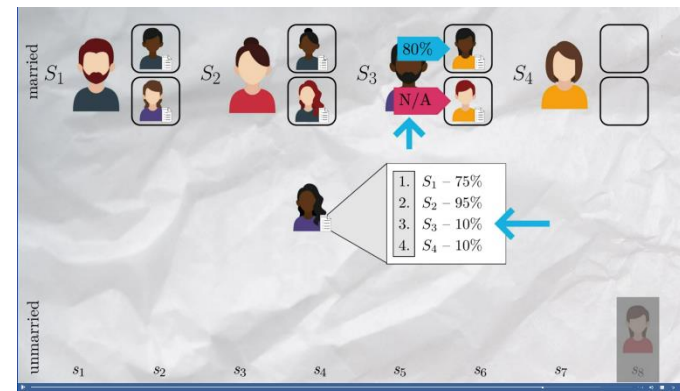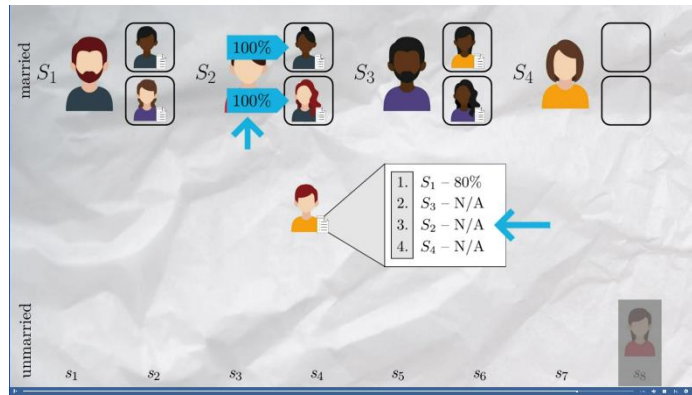- In general, very bad idea, not recommended

Example: last term allocation of seminars

- One student submitted only <u>one assignment</u> for one seminar

- The algorithm did not give him the seminar with <u>preference 1</u> because 15 students had better scores than him

- Because he had no other assignments, he was passed down to his lowest preference and received, a seminar with <u>preference 11</u>

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How to Get a Project Group
Assignments & Preferences

On our website www.upb.de/cs/pg you will find a nice video

- that explains the algorithm

- and it shows what happens when you fill out too few assignments

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How to Get a Project Group
Stable Marriage

Phase 3: Stable Marriage

- The project group advisors <u>score</u> the <u>assignments of the students</u> with points

- The more points a student gets from the advisor,
  the greater the chance of a project group seat

Now we apply the Stable Marriage algorithm

- <u>Scores rank students</u> from project groups <u>advisor's perspective</u>

- <u>Preferences</u> of the students rank the <u>project group</u> from <u>student perspective</u>

- Based on both, we compute a stable marriage

- The <u>Stable Marriage</u> algorithm matches students to project groups

- Each student gets a project group!

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How to Get a Project Group
Stable Marriage

Stable Marriage - Wikipedia

" A matching is a mapping from the elements of one set to the elements of the other set.
A matching is not stable if:

1. There is an element A of the first matched set which prefers some given element B of the second matched set over the element to which A is already matched, and

2. B also prefers A over the element to which B is already matched.

In other words, a matching is stable

when there does not exist any match (A, B)
by which both A and B would be individually better
off than they are with the element to which they are currently matched. "

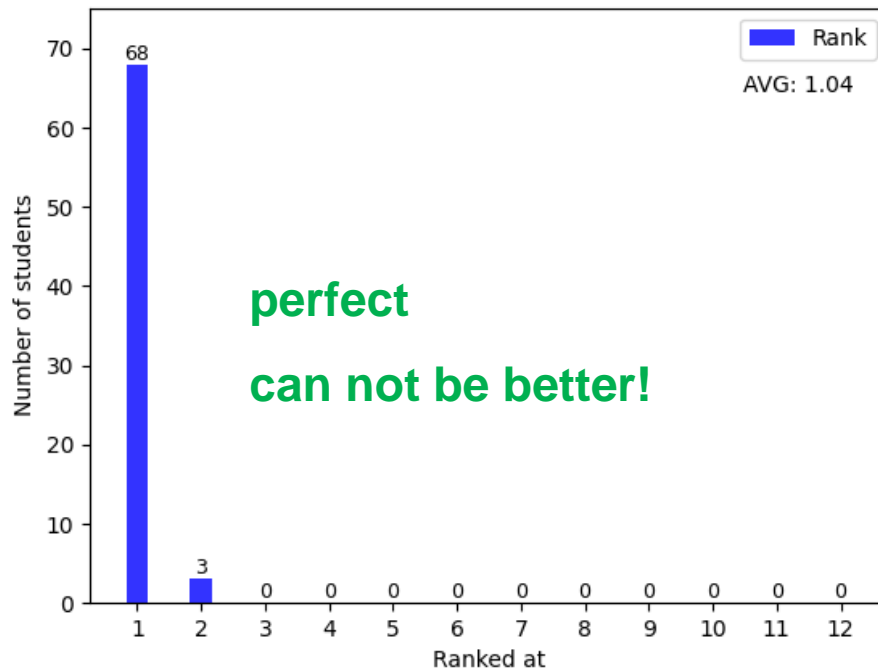Stable Marriage Algorithm is a deterministic algorithm !

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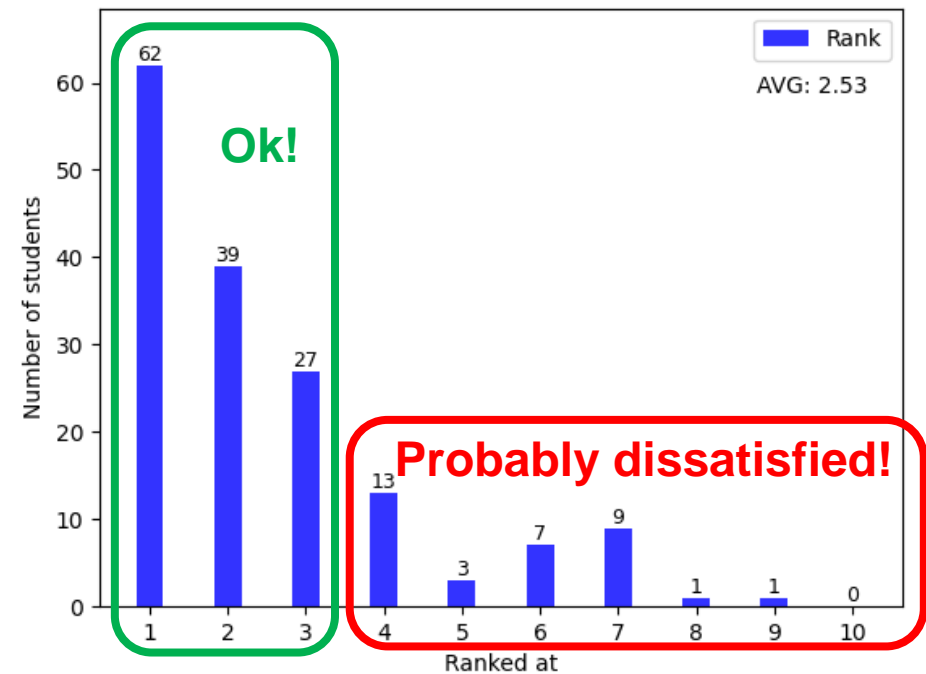
How to Get a Project Group
Stable Marriage

A allocation only creates satisfaction if the demand is evenly distributed over the offer.
If too many students prefer the same project group,
not all of them will be able to get their first preference!

Example
Project Groups starting Summer 2022   **Seminars starting Summer 2022**

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How to Get a Project Group
Notification & Decision

Phase 4: Notification & Decision

- The students are informed which project group they have been assigned

  (by PAUL and Jupyter system)

- Final result will be entered into PAUL, students move

  from: the course L.079.07099 All Project Groups Winter Term 2024/25

  to: the actual course

  by PAUL administration

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How to Get a Project Group
Notification & Decision

Phase 4: Notification & Decision

Do students have to participate in a project group they do not like?

1. No, they can refuse the assigned project group!
   However, they may be will not get another project group in Winter Term 2024/25

2. Possible exceptions are:

   - two students wish to swap places and receive the approval from both advisors, they can do so

   - places become available (e.g., because students have cancelled) and advisors agree

How is this organized?

- Students ask me by email: mafi@upb.de

- Advisors email me free places

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More Information, Webpages, Links, pdf Files

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

- **Listing** of all project groups (each listed group points to advisor's PG web page)

- Information of the overall **registration and notification process**
  https://cs.upb.de/studium/studienelemente/projektgruppen/zuordnungsverfahren
  https://cs.upb.de/en/studies/study-elements/project-groups/matching-method

- **Guidelines for project groups**
  follow the links
  „guidelines for project groups"   https://cs.upb.de/en/studies/study-elements/general-guidelines/project-groups
  Rahmenrichtlinien für Projektgruppen"   https://cs.upb.de/studium/studienelemente/rahmenrichtlinien/projektgruppen

- Please read it before you start a project group!

Thank you for listening!

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