

Project Group Presentation

Summer Term 2024

Computer Science & Computer Engineering (Master)

Matthias Fischer

- Monday, February 5th, 4:15 pm,
- Lecture hall: O1

Agenda

Single Session for all Students CS & CE (lecture hall: O1)

16:15 Why Project Groups? Registration and Requirements

16:35 Mixed Project Groups (8)

17:55 CE Project Groups (3)

- 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. 18:25 (after ALL presentations)

- If you plan to take part in a group in Summer Term 2024, **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)

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

- 16:35 **Next Gen User Interface for optimization software based on Generative AI**
Machine Learning and Optimisation
- 16:45 **Vector Graphics on Modern Hardware**
Quantum Computation
- 16:55 **Networked Systems**
Computer Networks
- 17:05 **Quantum Information with Higher-Dimensional Qubits**
Quantum Information
- 17:15 **WiFi-based Human Sensing using FPGA-accelerated Lightweight Neural Networks**
Computer Engineering Group
- 17:25 **Support Tool for University Lecture Planning**
Databases and Electronic Commerce
- 17:35 **Securing E-Mail with Automated Learning**
System Security
- 17:45 **Adaptive Virtual Tutor for Chemistry Study Preparation**
Theory of Distributed Systems

CE Project Groups (2x9 ECTS)

- 17:55 **Study of Physiological Signals from EEG and Wristband sensors for stress detection**
Signal and System Theory
- 18:05 **Disaster Response Robots**
GET Lab - Cognitive Systems Engineering
- 18:15 **MoreGRIP-V**
System and Circuit Technology (Wolfgang Müller)

Explaining Graph Neural Networks 2 (PAUL)

Explaining Graph Neural Networks (PAUL and Webpage)

Dominik Köhler, Stefan Heindorf

Project group is canceled

Definition

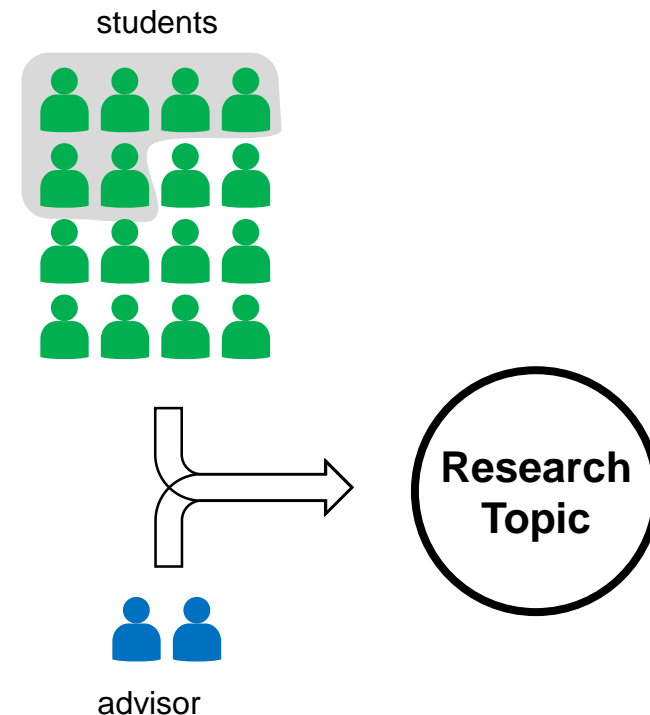
Project Group

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

- 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)

Default language is English.

If all participating students agree, the group can be held in German.

Aims: Improvement of character building (1/2)

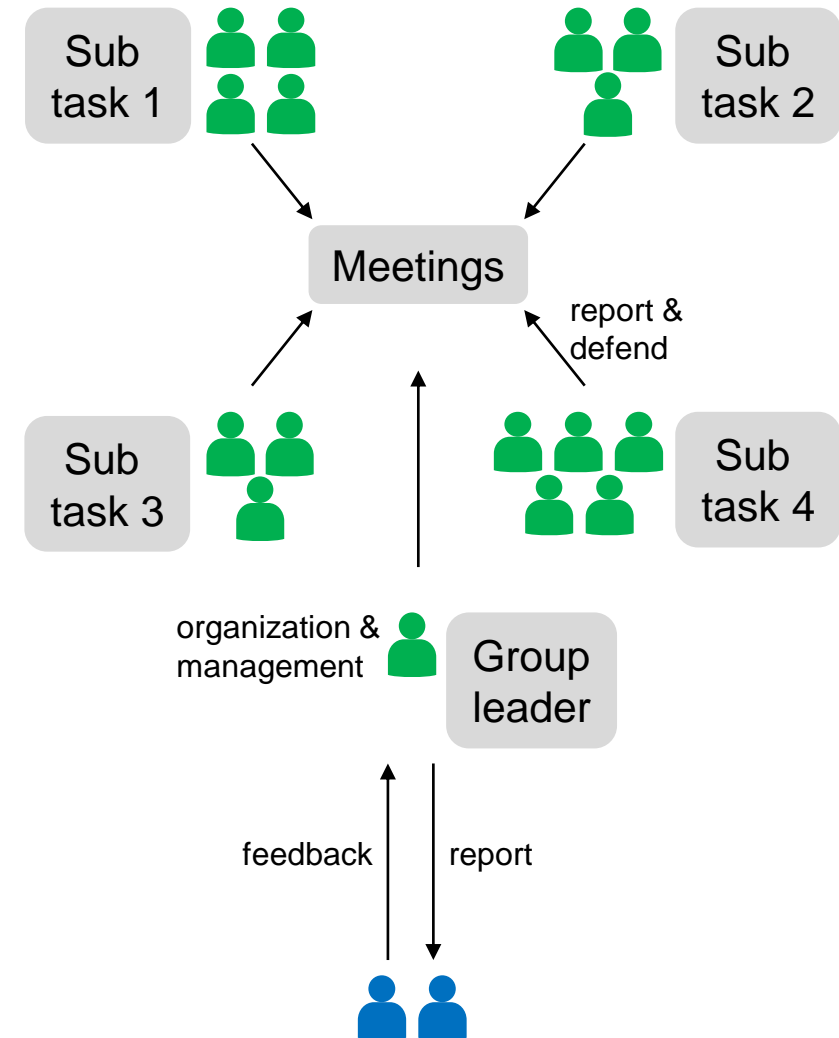
Project Group

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

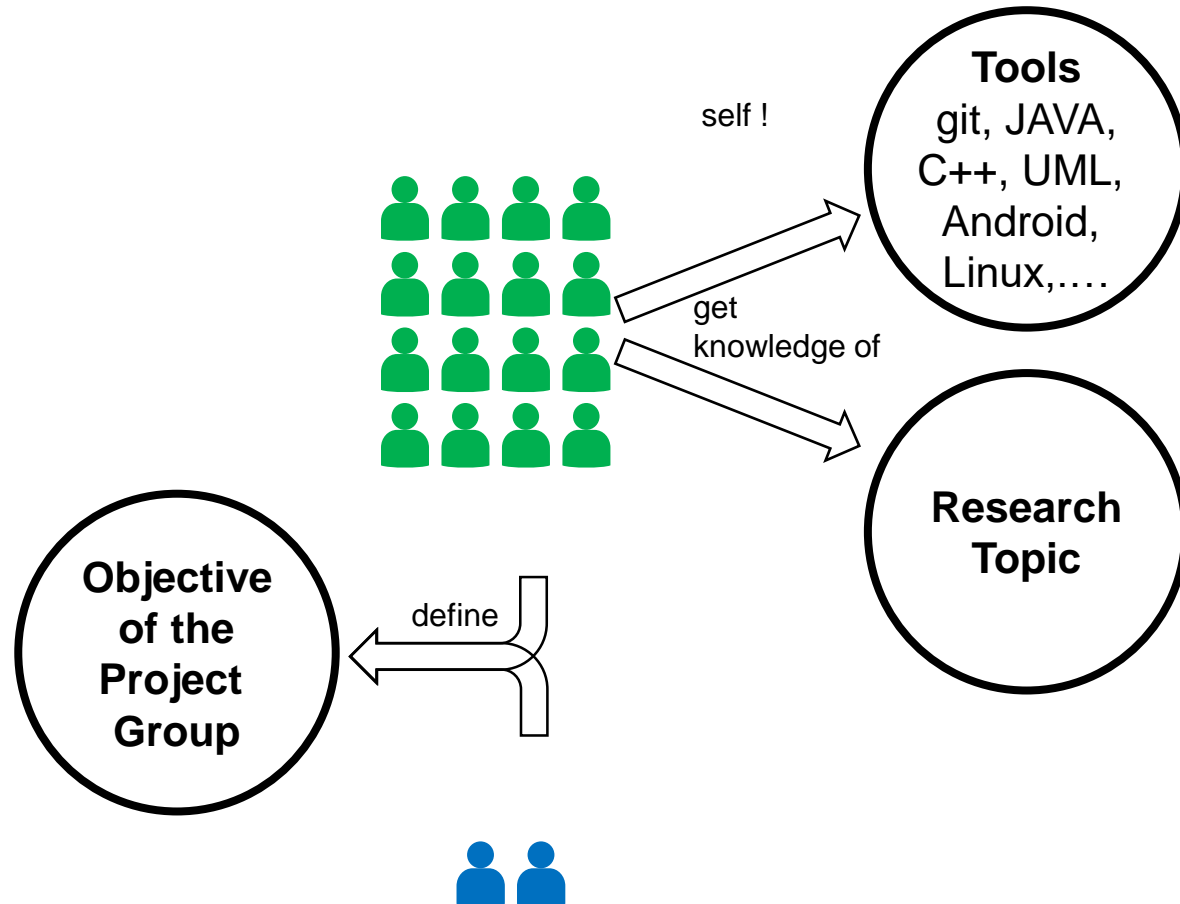


Aims: Improvement of character building (2/2)

Project Group

Self-organization

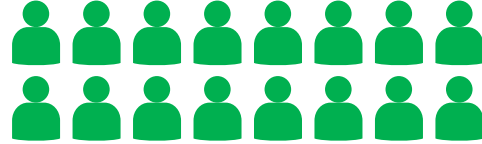
- **Define the aims** on your own together with the advisors
- **Self training** with necessary tools, methods and approaches



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

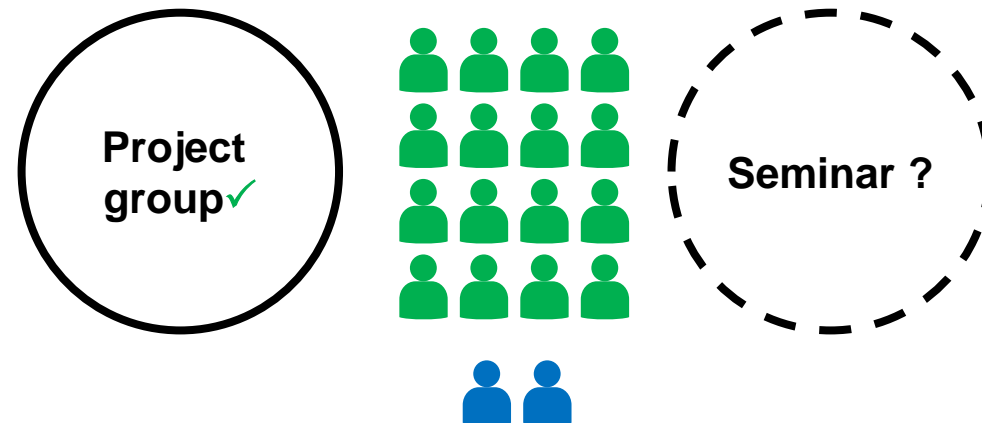
Seminar

Project Group

Seminar as 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



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)

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

Bachelor Students who cannot apply electronically via PAUL due to missing master status 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 2023/24"

E-mail body: Hallo, ich möchte mich zu diesem Kurs anmelden: "L.079.07099 All Project Groups Winter Term 2023/24"

Name: ???

Matrikelnummer: ???

Uni-E-Mail: ???

IMT-Benutzername: ???

Studiengang (CS/CE): ???

How to Get a Project Group

Method to Match Students to Project Groups

Method consist of 4 phases:

- **Phase 1:** PAUL registration
February 19 - February 25 (timely registration)
February 26 - March 24 (late registration)
- **Phase 2:** Assignments & Preferences
February 27 - March 17
- **Phase 3:** Stable Marriage
March 25
- **Phase 4:** Result's Notification & Decision
April 2 (PAUL registration by administration & email notification)

- Advisor final grading: 19 - 24 March
Autograding: 18 March

How to Get a Project Group

PAUL registration

Phase 1 – PAUL registration

- You register only for one course:
“**L.079.07099 All Project Groups Summer Term 2024**”
- 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 can't register for them

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)

How to Get a Project Group

PAUL registration

Registration in PAUL is only possible

- if the **re-registration (renewal of matriculation)** for the summer 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!)

How to Get a Project Group

Assignments & Preferences

Phase 2 – Assignments & Preferences

Consist of 2 steps:

Step 1

- Students state the preferences for all 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

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

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 **27 February** <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 Summer Term 2024 !

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

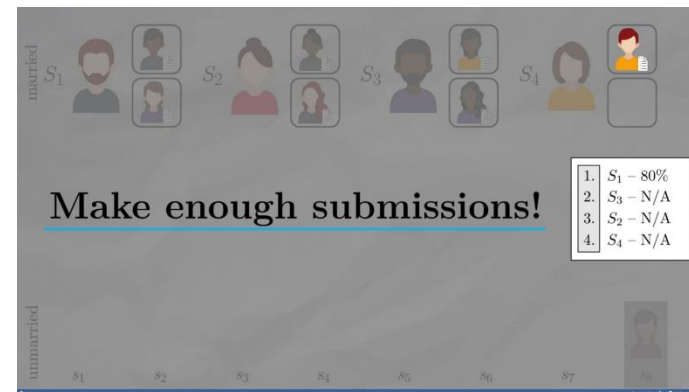
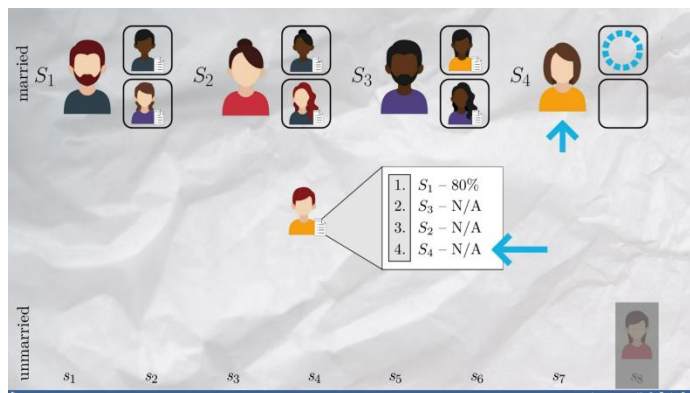
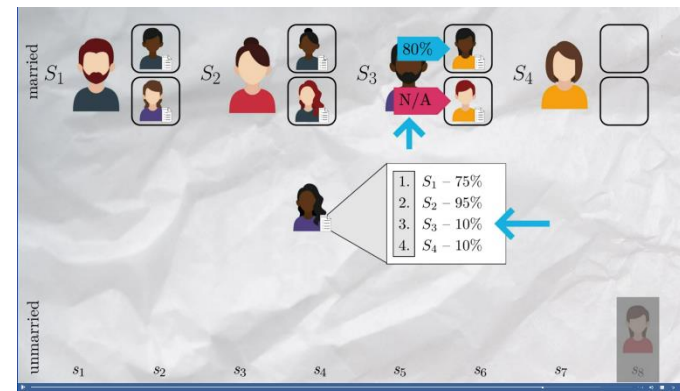
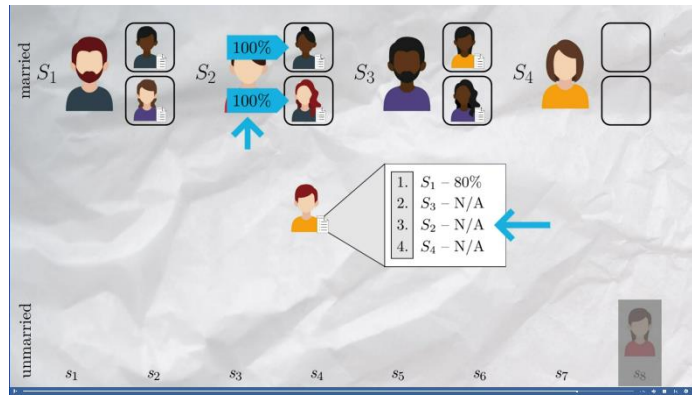
Example: last term allocation of seminars

- One student submitted only one assignment for one seminar
- The algorithm did not give him the seminar with preference 1 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 preference 11

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



How to Get a Project Group

Stable Marriage

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

Now we apply the Stable Marriage algorithm

- Scores rank students from project groups advisor's perspective
- Preferences of the students rank the project group from student perspective
- Based on both, we compute a stable marriage
- The Stable Marriage algorithm matches students to project groups
- Each student gets a project group!

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 !

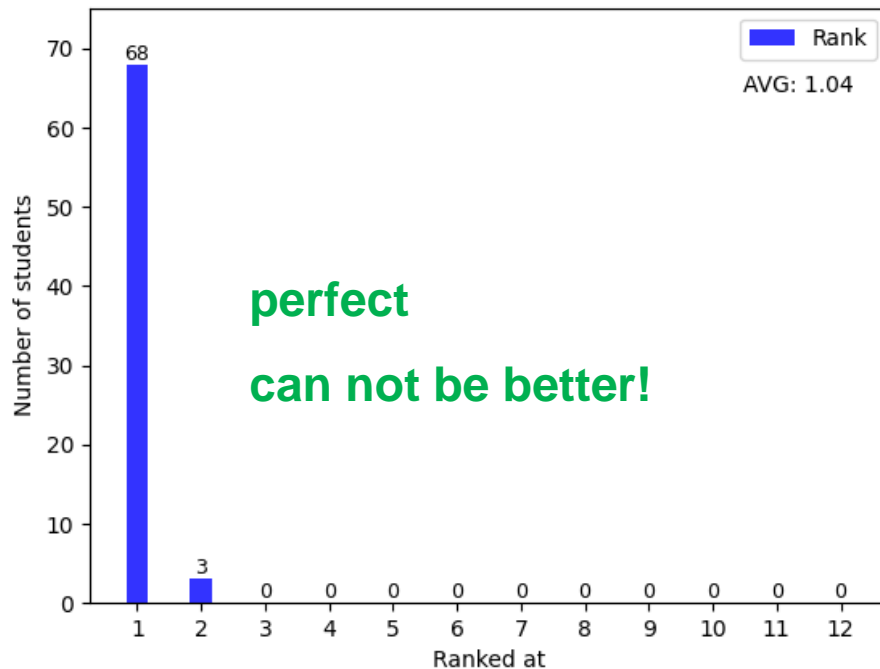
How to Get a Project Group

Stable Marriage

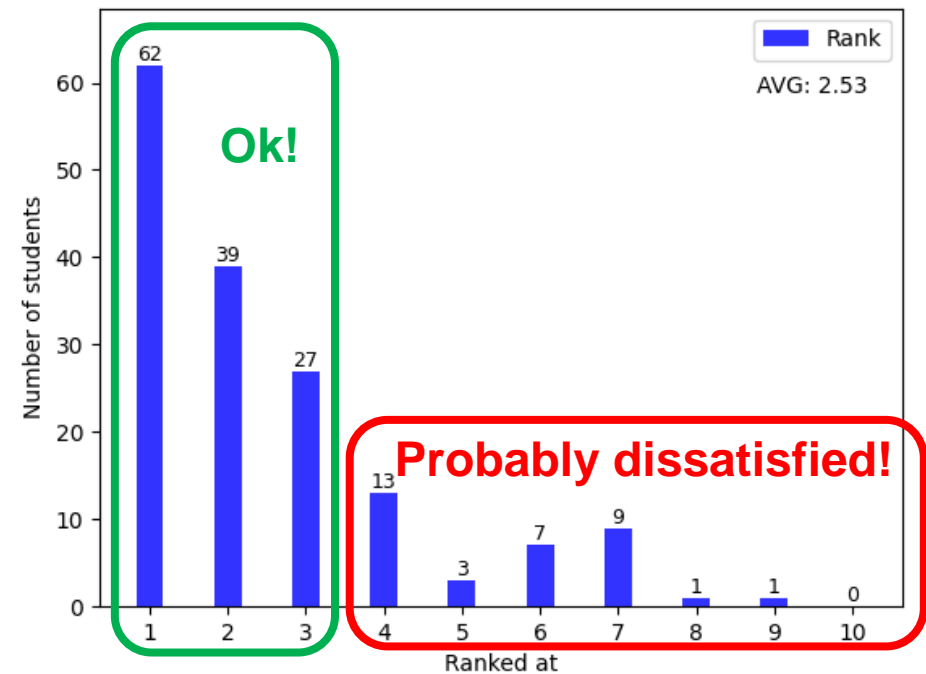
A allocation only creates satisfaction if the demand is evenly distributed over the offer.
If too many students prefer the same project group,
not all of them will be able to get their first preference!

Example

Project Groups starting Summer 2022



Seminars starting Summer 2022



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 Summer Term 2024
to: the actual course
by PAUL administration

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 Summer Term 2024
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

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!