

# **Project Group Presentation**

**Summer Term 2021**

**Master Computer Science & Master Computer Engineering**

Matthias Fischer

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- Monday, February 15<sup>th</sup>, 4:15pm,
- Video Conference via BigBlueButton
  
- Please: mute microphone, no camera!

# Agenda

## One Session for all Students CS & CE

16:15 Why Project Groups? Registration and Requirements

16:35 CS Project Groups (4)

17:15 CE Project Groups (4)

17:55 Mixed 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.
- Please: mute microphone, no camera!
- BBB-room: <https://bbb.imt.upb.de/b/mat-f6t-d2q> (this room, here we are)

## 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)

## CS Project Groups (2x10 ECTS)

16:35	<b>LEMMING</b> is an example mimicking graph generator Datascience
16:45	<b>ORCA: a crawler analysis benchmark</b> Datascience
16:55	<b>Knowledge Graph Fusion</b> Datascience
17:05	<b>Explainable Artificial Intelligence</b> Datascience

## CE Project Groups (2x9 ECTS)

17:15	<b>From Speech Detection to Recognition on Fearless Steps Data</b> Communication Engineering
17:25	<b>Designing a Brain-Controlled Machine using EEG Signals</b> Signal and System Theory Group
17:35	<b>Disaster Response Robots</b> GET Lab - Technische kognitive Systeme
17:45	<b>Reinforcement Learning for Power Electronics</b> Power Electronics and Electrical Drives

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

17:55	<b>Programmable Matter</b> Theory of Distributed Systems
18:05	<b>Virtual Technologies in Engineering</b> Advanced Systems Engineering
18:15	<b>Artificial Intelligence for Systems Engineering</b> Advanced Systems Engineering

# Agenda

## 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 2021, please stay!
- There will be individual discussions in groups with the students and the advisors.
- Build small groups for questions, discussion, declare personal interest.

## How ?

- Each project group advisor has its own BBB room.
- You can visit any BBB room in any order.

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

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(and EE students, not  
the concern today)

# Where are the BBB-links of the project group advisors?

1. Below the name of the project group on the website:  
<http://www.upb.de/cs/pg>
2. In my email dated 8/9 February
3. Shared Notes window in BBB, see left, make cut and paste
4. Here:

## CS+CE groups

Programmable Matter  
Artificial Intelligence for Systems Engineering  
Virtual Technologies in Engineering

<https://bbb.uni-paderborn.de/b/chr-gr7-229>  
<https://bbb.uni-paderborn.de/b/ulf-zgk-ud7-wcx>  
<https://bbb.uni-paderborn.de/b/ulf-7ts-s2p-pgk>

## CS only groups

LEMMING is an example mimicking graph generator  
ORCA: a crawler analysis benchmark  
Knowledge Graph Fusion  
Explainable Artificial Intelligence

<https://bbb.uni-paderborn.de/b/mic-ykg-tfy>  
<https://bbb.uni-paderborn.de/b/mic-ykg-tfy>  
<https://bbb.uni-paderborn.de/b/moh-rqt-hlu-cdb>  
<https://bbb.uni-paderborn.de/b/ste-ygj-1dk-rgg>

## CE only groups

From Speech Detection to Recognition on Fearless Steps Data  
Designing a Brain-Controlled Machine using EEG Signals  
Disaster Response Robots  
Reinforcement Learning for Power Electronics

<https://ntbbb.uni-paderborn.de/b/jen-zxy-w4m>  
<https://bbb.uni-paderborn.de/b/ine-cq3-3f4>  
<https://bbb.uni-paderborn.de/b/dir-h1w-ei2-c0b>  
<https://bbb.uni-paderborn.de/b/wil-2fu-man-dpd>

## CS + CE Project Groups

- Title of PG: **Programmable Matter (PROGMAT)**  
Supervisor: **Christian Scheideler, Andreas Padalkin**  
Research Group: Theory of Distributed Systems  
**BBB video room** for individual discussions after the presentations
- Title of PG: **Artificial Intelligence for Systems Engineering (AI4SE)**  
Supervisor: **Ruslan Bernijazov**  
Research Group: Advanced Systems Engineering  
**BBB video room** for individual discussions after the presentations
- Title of PG: **Virtual Technologies in Engineering (VirTEng)**  
Supervisor: **Ulf Könemann, Daniel Eckertz, Florian Dyck**  
Research Group: Advanced Systems Engineering  
**BBB video room** for individual discussions after the presentations

## CS Project Groups

- Title of PG: **LEMMING is an example mimicking graph generator (LEMMING)**  
Supervisor: **Michael Röder**  
Research Group: Data Science  
**BBB video room** for individual discussions after the presentations
- Title of PG: **ORCA: a crawler analysis benchmark (ORCA)**

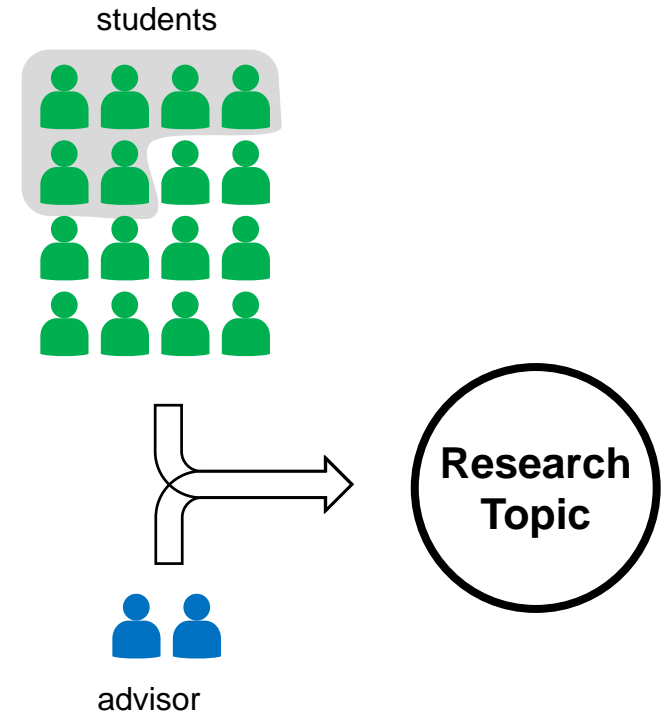
# Definition

## 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)

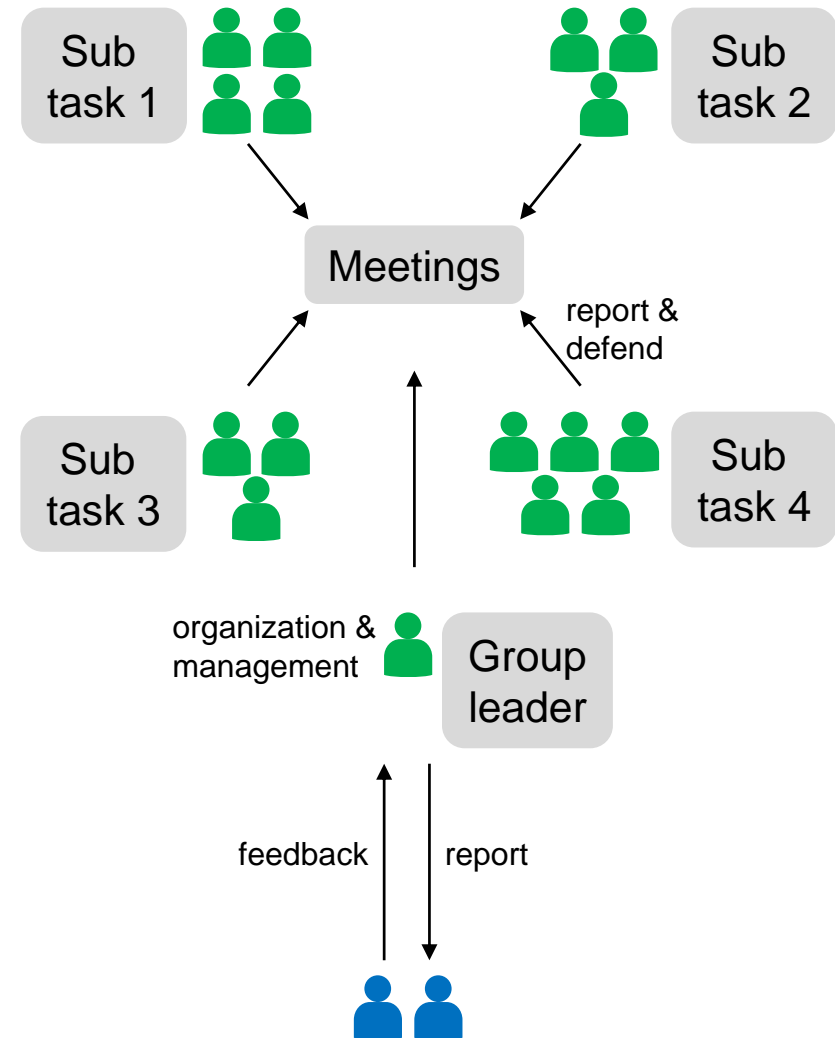
## Project Group

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



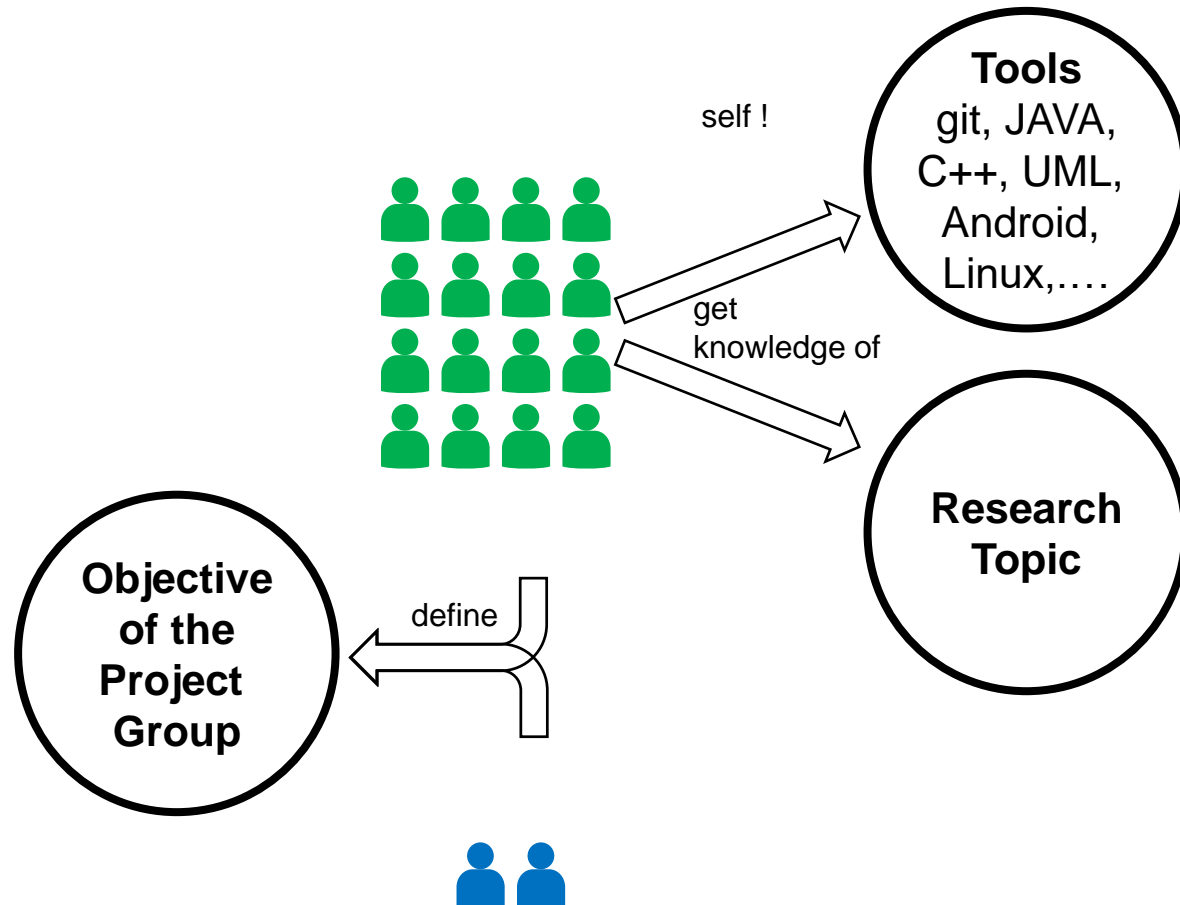


# Aims: Improvement of character building (2/2)

## 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

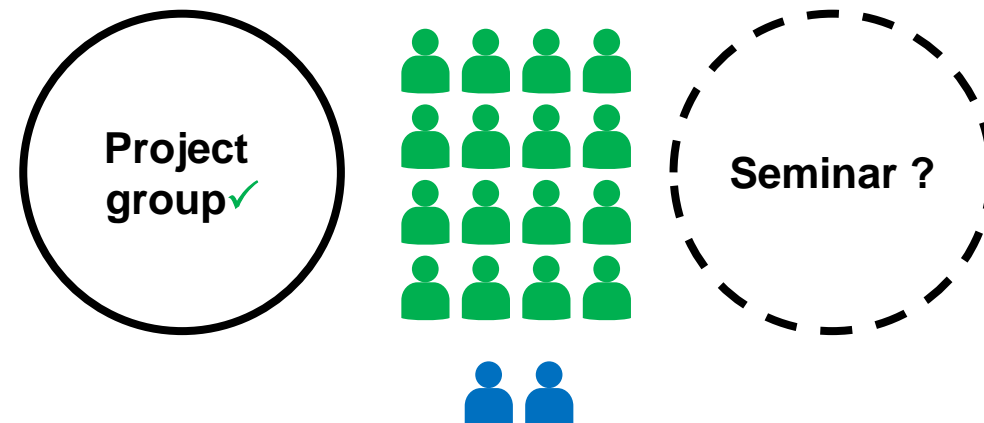
# Seminar

## 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 the 31st of March or on the 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>

# How to Get a Project Group

## Method to Match Students to Project Groups

Method consist of 4 phases:

- **Phase1:** PAUL registration  
February 22 - February 28, only one week !
- **Phase 2:** Assignments & Preferences  
March 3 - March 21
- **Phase 3:** Stable Marriage  
March 29 - March 31
- **Phase 4:** Notification & Decision  
April 1
  
- Advisor final grading: March 23 - 26

# How to Get a Project Group

## PAUL registration

### Phase 1 – PAUL registration

- February 22 - February 28, only one week !
- You register only for one course:  
“**L.079.07099 All Project Groups Summer Term 2021**”
- The course captures the registration for all project groups, here you cannot choose your preferred groups!
- 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

### 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!** **DON'T WAIT!**

We will not accept any late registration for project groups due to too late renewal of matriculation.

(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

- **March 3 - March 21**

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

- **March 3 - March 21**

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
- ... whatever the organizer needs

# How to Get a Project Group Assignments & Preferences

## Phase 2 – Assignments & Preferences

- **March 3 - March 21**

Consist of 2 steps:

### Both Steps

- Where? → Tool chain by Jupyter and nbgrader extension
- You can log in starting on **March 3<sup>rd</sup>**

### For how many project groups should I take the test?

Recommendation

- Minimum: 3
- Better: 4 - 5
- More than five? → May be waste of time

### New !

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  
2021 !

# How to Get a Project Group

## Stable Marriage

### Phase 3: Stable Marriage

- **March 29 - March 31**
- The project group advisors score the assignments of the students with points (March 23 - 26)
- 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

## Notification & Decision

### Phase 4: Notification & Decision

- **April 1**
- 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 2021 to the actual course by PAUL administration

# How to Get a Project Group

## Notification & Decision

### Phase 4: Notification & Decision

- April 1

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

1. No, they can refuse the assigned project group!  
However, they will not get another project group!
2. The only exception is:
  - two students wish to swap seats and receive the approval from both advisors, they can do so
  - Seats become available (e.g., because students have cancelled) and advisors agree

### How is this organized?

- Students ask me by email
- 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**
- **Guidelines for project groups** (Rahmenrichtlinien für Projektgruppen)  
follow the links „guidelines for project groups / Rahmenrichtlinien für Projektgruppen“  
Please read it before you start a project group!

**Bachelor Students** who cannot apply electronically via PAUL due to missing master status register in written form via the printed form

- **German:** "Antrag auf Zulassung zu einer Lehrveranstaltung in PAUL"  
[http://www.upb.de/fileadmin/paul-info/Formulare/Antrag\\_Anmeldung.pdf](http://www.upb.de/fileadmin/paul-info/Formulare/Antrag_Anmeldung.pdf)  
**English:** "Application for admission to a course "  
[http://www.upb.de/fileadmin/paul-info/Formulare/Antrag\\_Anmeldung\\_english.pdf](http://www.upb.de/fileadmin/paul-info/Formulare/Antrag_Anmeldung_english.pdf)  
**both on:** <http://www.upb.de/studium/paul-info/formulare>
- **AND:** Send an email to PAUL to apply for project group's registration