Project Group Presentation
Summer Term 2020
Master Computer Science & Master Computer Engineering

Matthias Fischer

- Monday, January 27th, 6:00pm,
- Rooms O1 and O1.258
Agenda

Joint Session for CE + CS Students
18:00  Why Project Groups? Registration and Requirements
18:15  Mixed Project Groups – Room: O1
After the last talk: CE students move to O1.258 CS students stay here

Parallel Sessions
19:40  CS Project Groups – Room: O1
19:40  CE Project Groups – Room: O1.258

Discussion Session
If you plan to take part in a group in Summer Term 2020, please stay here!
20:00 (CS), 20:30 (CE): In front of or in room O1, O1.258

- build small groups for questions, discussion, application, declare personal interest
- CE students (room O1.258) can first discuss with CE advisors and afterwards come back to O1
- Mixed PG advisors: Please wait for CE students (at least until 20:30) !!!

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)
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Course</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>18:15</td>
<td>3D Environment Based Intelligent Systems Engineering of Advanced Systems</td>
<td>Advanced Systems Engineering</td>
<td>Roman Dumitrescu</td>
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<tr>
<td>18:25</td>
<td>Multi-armed bandit algorithms</td>
<td>Intelligent Systems and Machine Learning</td>
<td>Eyke Hüllermeier</td>
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<td>18:35</td>
<td>Artificial Intelligence in Computer Networks</td>
<td>Computer Networks</td>
<td>Holger Karl</td>
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<td>18:45</td>
<td>Artificial Intelligence for Systems Engineering</td>
<td>Advanced Systems Engineering</td>
<td>Roman Dumitrescu</td>
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<td>18:55</td>
<td>Virtual Reality in Design Thinking</td>
<td>Advanced Systems Engineering</td>
<td>Roman Dumitrescu</td>
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<td>19:05</td>
<td>Local Strategies for 2- and 3-dimensional Swarm Formation Problems</td>
<td>Algorithms and Complexity</td>
<td>Friedhelm Meyer auf der Heide</td>
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<tr>
<td>19:15</td>
<td>Virtual and Augmented Reality Assisted Robot Programming</td>
<td>Database and Information Systems</td>
<td>Gregor Engels</td>
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<td>19:25</td>
<td>Robust Distributed Transaction System</td>
<td>Theory of Distributed Systems</td>
<td>Christian Scheideler</td>
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<td>19:35</td>
<td>PhASAR Input/Output</td>
<td>Software Engineering</td>
<td>Eric Bodden</td>
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### CS Project Groups (2x10 ECTS)

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>19:40</td>
<td>University Credits 4.0 IT Security, <em>Ben Hermann</em></td>
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<td>19:50</td>
<td>Data Science Suite IV Data Science, <em>Axel Ngonga</em></td>
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### CE Project Groups (2x9 ECTS)

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<th>Instructor(s)</th>
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<tbody>
<tr>
<td>19:40</td>
<td>Disaster Response Robots GET Lab - Technische kognitive Systeme, <em>Bärbel Mertsching</em></td>
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<tr>
<td>19:50</td>
<td>Signal Processing and Maschine Learning over Acoustic Sensor Networks Communications Engineering Group, <em>Jörg Schmalenströer</em></td>
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<tr>
<td>20:00</td>
<td>Design &amp; Implementation of a HexaPod Computer Engineering (EIM-E), <em>Sybille Hellebrand</em></td>
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<tr>
<td>20:10</td>
<td>Reinforcement Learning for Electric Motor Control Power Electronics and Electrical Drives, <em>Joachim Böcker</em></td>
<td></td>
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<tr>
<td>20:20</td>
<td>Signal processing and machine learning of brain signals using EEG Signal and System Theory Group, <em>Peter Schreier</em></td>
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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

Tools
- git, JAVA, C++, UML, Android, Linux,…

Research Topic

Objective of the Project Group

Download these slides:
- www.upb.de/cs/pg
- www.upb.de/cs/pgen
**Outcome**

**Project Group**

Your 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 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:

- **Phase 1:** PAUL registration
  February 17 - February 23, only one week!

- **Phase 2:** Assignments & Preferences
  February 27 - March 15

- **Phase 3:** Stable Marriage
  March 23 - 27

- **Phase 4:** Notification & Decision
  March 30

- Advisor final grading: March 16 - 20
How to Get a Project Group
PAUL registration

Phase 1 – PAUL registration

- **February 17 - February 23, only one week!**
- You register only for one “virtual” project group: “L.079.07099 All Project Groups Summer Term 2020”
- 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

Download these slides:
www.upb.de/cs/pg
www.upb.de/cs/pgen
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](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. **NO EXCEPTIONS!**

(CE students: The one-week registration phase is only valid for PGs of ET organizers participating in this procedure.)
How to Get a Project Group
Assignments & Preferences

Phase 2 – Assignments & Preferences

- February 27 - March 15

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

- February 27 - March 15

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

Download these slides:
www.upb.de/cs/pg
www.upb.de/cs/pgen
How to Get a Project Group
Assignments & Preferences

Phase 2 – Assignments & Preferences

- February 27 - March 15

Consist of 2 steps:

Both Steps

- Where? → Tool chain by Jupyter and nbgrader extension
- You can log in starting on 27th February

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?

→ Please deregister in PAUL L.079.07099 All Project Groups Summer Term 2020!
How to Get a Project Group

Stable Marriage

Phase 3: Stable Marriage

- March 23 - 27
- The project group advisors score the assignments of the students with points (March 16 - 20)
- 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

- March 30

- The students are informed which project group they have been assigned (We do not yet know how you get informed, probably by PAUL)

- Final result will be entered into PAUL, students move from virtual project group L.079.07099 All Project Groups Summer Term 2020 to the actual course by PAUL administration

Download these slides:  
www.upb.de/cs/pg  
www.upb.de/cs/pgen
How to Get a Project Group
Notification & Decision

Phase 4: Notification & Decision

- March 30

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 the advisors by email
- Advisors announce free places (e.g. webpage, e-mail)
More Information, Webpages, Links, pdf Files

Main web page for project groups: [http://www.upb.de/cs/pg](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](http://www.upb.de/studium/paul-info/formulare)

- **AND**: Send an email to PAUL to apply for project group’s registration