Lab Course / “Praktikum”: 
*Project Management and Software Development for Medical Applications*

**Introduction – SS2022**

Conducted by: 
Ardit Ramadani, Lennart Bastian and Tianyu Song 
Prof. Dr. Nassir Navab - CAMP
Work with clinicians on real-world medical applications

Improve your project management and presentations skills
Lecture Structure

• **4 lectures** by course tutors (**recommended to attend**)  
  – Introduction (Administrative, Requirements, Grading) – **Mandatory**  
  – Project Management & Presentation Tips  
  – Introduction to Software Engineering - Unified Modeling Language (UML)  
  – Introduction to Software Engineering - Documentation, Tests, Design Patterns & Integration Strategy

• **3 presentations** by students (**Mandatory**)  
  – Requirements (5 mins)  
  – Intermediate (7 minutes)  
  – Final (incl. demo) (10 minutes)

• **Minimum 10 hours per week** of project work during the semester
CoVid-19 related announcements

• Due to CoVid-19 and subsequent government measures, short term changes might be necessary
  – Follow the announcement section on the website of the course
  – After registration, check emails regularly

• As of today (03 February 2022) we are planning
  – Only virtual lectures and presentations conducted via TUM Zoom
  – Presence might be required by supervisors depending on the Project
    • not guaranteed 100% online course
### Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Place</th>
<th>Topic</th>
<th>Conducted by</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBA</td>
<td>09:00 - 10:00</td>
<td>Zoom</td>
<td>Lecture 1: Introduction and Project Announcement</td>
<td>Course tutors</td>
</tr>
<tr>
<td>TBA</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Lecture 2: Presentation Tips and Project Management Lecture 3: UML</td>
<td>TBA</td>
</tr>
<tr>
<td>TBA</td>
<td>23:59 CEST</td>
<td>Email</td>
<td>Deadline to send project preferences</td>
<td>Seminar Participants</td>
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<tr>
<td>TBA</td>
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<td>Zoom</td>
<td>Requirements Presentation</td>
<td>Seminar Participants</td>
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<tr>
<td>TBA</td>
<td>10:00 - 12:00</td>
<td>Zoom</td>
<td>Lecture 4: Documentation, Tests, Design Patterns &amp; Integration Strategy</td>
<td>TBA</td>
</tr>
<tr>
<td>TBA</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Intermediate Presentations Part I</td>
<td>Seminar Participants</td>
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<tr>
<td>TBA</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Intermediate Presentations Part II</td>
<td>Seminar Participants</td>
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<tr>
<td>TBA</td>
<td>09:00 - 12:00</td>
<td>Zoom</td>
<td>Final Presentations Part I</td>
<td>Seminar Participants</td>
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<tr>
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<td>Final Presentations Part II</td>
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</tr>
</tbody>
</table>
Projects will be on Software Development in Medical Applications

- Involves “Medical Application” and “Software Development”
- In collaboration with Hospital or Industry or Research Institute
- In the previous years, example projects were based on:
  - Image Analysis (Registration, Segmentation, Quantification)
  - Graphical User Interface design
  - Mobile App Development
  - Robotics
  - Machine Learning, Deep Learning
  - Computer Vision
  - Image Reconstruction
  - Simulations and Modeling
  - Augmented Reality
  - Computer Graphics
Project proposals

Summer Semester 2020

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of projects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>21</td>
<td>91%</td>
</tr>
<tr>
<td>Industry</td>
<td>2</td>
<td>9%</td>
</tr>
</tbody>
</table>

*Tab. Project proposal's source*

23 total projects
1 company from industry participated

Winter Semester 2020/2021

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of projects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>17</td>
<td>80%</td>
</tr>
<tr>
<td>Industry</td>
<td>4</td>
<td>20%</td>
</tr>
</tbody>
</table>

*Tab. Project proposal's source*

21 total projects
3 companies from industry participated

Summer Semester 2021

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of projects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>17</td>
<td>63%</td>
</tr>
<tr>
<td>Industry</td>
<td>10</td>
<td>37%</td>
</tr>
</tbody>
</table>

*Tab. Project proposal's source*

27 total projects
5 companies from industry participated

Winter Semester 2021/2022

<table>
<thead>
<tr>
<th>Source</th>
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<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>20</td>
<td>59%</td>
</tr>
<tr>
<td>Industry</td>
<td>14</td>
<td>41%</td>
</tr>
</tbody>
</table>

*Tab. Project proposal's source*

34 total projects
8 companies from industry participated
You are a Project Manager as well as a Software Developer

• Make and follow your project plan
  – Gather requirements
  – Set goals and tasks
  – Derive milestones
  – Make Gantt chart (project time plan)

• Design and implement the software
  – Design patterns, use case and class diagram
  – Programming in higher level languages (C/C++, Python, Java, Matlab etc.)
  – Development tools like IDEs, version control (GIT) etc.

• Present your work to the course tutors and supervisors
  – 3 presentations: Requirements, Intermediate, Final (with demo)
Project Assignment

• Project proposals will be announced in the web-site of the course in due time
  – You need to send us your application with 3 preferred projects and motivation
  – Find application form under Downloads > “Student project application template”

• We will try to assign students one project from their preferences
  – Mixture of “FCFS” and maximization of first choices
  – There is no guarantee that you will get one of your preferences

• FAQ
  – My first preference is unassigned, and I am assigned to my second/third preference
    • we try to maximize the number of supervisors included in the course as well
  – Is it possible to change the project to another one that is not assigned
    • NO
Project Assignment (continued)

• Students can propose their own projects through a collaboration with a Postdoc/PhD candidate or Industry Partner
  – Project must be submitted by the supervisors
  – Tutors must approve the project before project kick-off
  – The deadline to submit projects is two weeks before lecture period start
  – Find Project Proposal Template under Downloads > “Supervisor Project Proposal Template”

• Students must discuss the projects with their assigned supervisors only after the projects have been assigned
## Summer Semester 2020

<table>
<thead>
<tr>
<th>Choice</th>
<th>Number of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice assigned</td>
<td>10 students</td>
<td>56%</td>
</tr>
<tr>
<td>2nd choice assigned</td>
<td>6 students</td>
<td>33%</td>
</tr>
<tr>
<td>3rd choice assigned</td>
<td>2 students</td>
<td>10%</td>
</tr>
<tr>
<td>no submission</td>
<td>0 student</td>
<td>0%</td>
</tr>
</tbody>
</table>

Tab. Percentage of assigned projects based on student's preferences

## Winter Semester 2020/2021

<table>
<thead>
<tr>
<th>Choice</th>
<th>Number of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice assigned</td>
<td>10 students</td>
<td>50%</td>
</tr>
<tr>
<td>2nd choice assigned</td>
<td>7 students</td>
<td>35%</td>
</tr>
<tr>
<td>3rd choice assigned</td>
<td>2 students</td>
<td>10%</td>
</tr>
<tr>
<td>no submission</td>
<td>1 student</td>
<td>5%</td>
</tr>
</tbody>
</table>

Tab. Percentage of assigned projects based on student's preferences

## Summer Semester 2021

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<tr>
<th>Choice</th>
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<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice assigned</td>
<td>7 students</td>
<td>40%</td>
</tr>
<tr>
<td>2nd choice assigned</td>
<td>4 students</td>
<td>22%</td>
</tr>
<tr>
<td>3rd choice assigned</td>
<td>5 students</td>
<td>27%</td>
</tr>
<tr>
<td>no submission</td>
<td>2 student</td>
<td>11%</td>
</tr>
</tbody>
</table>

Tab. Percentage of assigned projects based on student's preferences

## Winter Semester 2021/2022

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<tr>
<th>Choice</th>
<th>Number of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st choice assigned</td>
<td>18 students</td>
<td>68%</td>
</tr>
<tr>
<td>2nd choice assigned</td>
<td>5 students</td>
<td>19%</td>
</tr>
<tr>
<td>3rd choice assigned</td>
<td>2 students</td>
<td>8%</td>
</tr>
<tr>
<td>no submission</td>
<td>1 student</td>
<td>4%</td>
</tr>
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</table>

Tab. Percentage of assigned projects based on student's preferences
Grading

- **This course has 10 ECTS**
  - Equivalent to 10 – 14 hours per week for 3 – 4 months

- **Project Supervisor** will grade based on performance (weight: 50%)
  - Requirement coverage
  - Implementation on time
  - Completion of the project goals
  - Regular communication

- **Course Tutors** will grade based on presentations (weight: 50%)
  - Fundamental requirements met (citations, correctness, formatting)
  - Presentation skills (get the message across)
  - Slides (proper layout of text and visual information, consistency)
  - Content (for example: introduction, software design, tasks, project management)
  - Time Management (presentation time management and project time management)
  - Course attendance
Grading (continued)

- Attendance to all presentations is **mandatory** (even if you are not presenting)
  - Every unexcused absence: – 0.3 on tutor grading
  - **Excuses**: Illness, funeral, civic duties, reasons beyond your influence (accident, earthquake...), work meeting that cannot be moved
  - **No Excuse**: overslept, holidays, don’t want to join
  - In any case, inform us in time and get a certificate

- **Good conduct**
  - Complete all assignments
  - Presentation dates cannot be moved – you get a slot, you take it
  - Follow the presentation rules
  - Upload your presentation slides at link provided latest by the deadline given
    - Failing to upload will have consequences on the grade for specific the presentation
  - Convince us that you want a good grade: layout and content matter!
  - Presenting with camera is compulsory
Presentation times

- Requirement presentation – **5 minutes**
- Intermediate presentation – **7 minutes**
- Final presentation – **10 minutes**
- Exceeding the time will be penalized
  - All times are including **presentation time** and **demos** (when applicable)
  - We will **interrupt** your presentation at **30s overtime**
  - You need to present for at least **30s less** than the time indicated
    - if you are faster, we will wait until time is over
Registration

• Highest priority is given to BMC students in their ≥2 semester who have never taken this course (guaranteed place*)
  – Informatics students ≥3 semesters are also prioritized
  – It is not possible to take the course to improve the grade (unless failed previously)

• Register through TUM Matching System ONLY
  – TUM Matching System (if possible) matching.in.tum.de
  – Matching FAQ docmatching.in.tum.de
Please follow the course webpage or write to us if you have specific questions

- **Website**
  - [https://wiki.tum.de/pages/viewpage.action?pageId=1040089518](https://wiki.tum.de/pages/viewpage.action?pageId=1040089518)

- **Course tutors**
  
  - Ardit Ramadani
    - ardit.ramadani@tum.de
  
  - Lennart Bastian
    - lennart.bastian@tum.de
  
  - Tianyu Song
    - tianyu.song@tum.de
Thank you