

Reporting on experiments with research integration in teaching

PIONEER – PhysiologIcal mOdeliNg computEr clustER

Name
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Course Name
Advanced physiological modelling https://kurser.ku.dk/course/smtk12022u
Study Board
Studieudvalget for Medicin og Teknologi, Danmarks Tekniske Universitet og Det Sundhedsvidenskabelige Fakultet, KU
Level and class size
MSc Programme 1 st year, 23 students.
Description of the experiment
<p>Students:</p> <ul style="list-style-type: none"> • The students used 3-2-1 format to design the project: 3 things they want to learn, 2 questions they want to answer, and 1 hypothesis they want to check. • The students assessed large population studies with more than 1200 different parameters and biomedical imaging data; • The students got on-line access to parallel computing facilities; • The students focused on the development of AI-algorithms to create new tools for better risk stratification of patients and to improve biomedical imaging techniques. <p>Teachers:</p> <ul style="list-style-type: none"> • Provided plenary lectures on state-of-the-art in the field • Organized weekly group meetings for in-depth assessments and discussions • Guided through interdisciplinary challenges • Provided big data storage, databases, computing facilities
Outcome for the students
<ul style="list-style-type: none"> • Work in interdisciplinary environment • Hands-on experience on big databases • Hands-on experience on cloud computing • Hands-on experience AI and new algorithms • Experience in biological interpretations of the obtained results
Outcome for the research
<ul style="list-style-type: none"> • New algorithms have been suggested • New criteria for image assessment have been proposed
Interaction between teaching, research and exams
Teaching has been conducted by solving particular research problem. Exam was conducted in the form of project presentation. The students have to defense their results and assess limitations of the methods.
Adapting of the experiment
The experiment ran as planned. Both teachers and students are satisfied with the results.
Strengths and weaknesses
<p><i>Strengths</i></p> <ul style="list-style-type: none"> • Work in interdisciplinary environment • Hands-on experience on IT and biomedicine

- Practical outcome

Weaknesses

- More projects are needed
- Plenary lectures are not of interest for all groups

Experienced challenges

To activate all students during plenary lectures

The most important experience

Open-ended problems as the project worked the best. An open-ended problem has several correct answers, and several ways to the correct answer(s); A few groups can work on the same problem and find different solutions/outcomes.

Will the experiment be conducted again?

Yes, we plan this experiment will become a permanent part of our teaching.