Research methods (Onderzoeksmethoden)

Aims of this course:
- Set up a research project
- Search literature
- Perform research in a scientific manner (with proper statistics)
- Present the results in a written report (in English)
- Present the results in an oral presentation (in English)

My approach:

You learn research methods not by talking about it, but by doing a real original research project.

Can be considered as an upscaled “profielwerkstuk” or a downscaled bachelor thesis.

I prefer to have a central theme in your individual research projects, which changes every time.

Last semester, the central theme was “ELO-ratings”

This semester, the central theme is “Monte Carlo methods”
In the lectures, I will give an introduction into Monte Carlo methods, and also suggest a large number of possible topics for your research project. Your choice is not restricted to my suggestions!

**What I expect:**

1) You perform a research project in pairs.  
   [Individual projects are allowed, but the grading is not more lenient.  
   A group of 3 is also allowed, but the grading will be more strict.]

2) Since the topic is Monte Carlo, you use a random number generator. I expect a discussion on the validity of the RNG in “Supplementary Online Material” (SOM).

3) You write a draft report (grading: pass/fail) on which you receive feedback

4) You present your project in an oral presentation (graded, 30%)

5) You present your project in a final written report (graded, 70%)
How many pages should the report contain?
- As few as possible!
- But: the report should be complete, and give interesting information, presented in a likable format
- You are expected to stick to the style of either a “Science report” (less than 2500 words, in their format ~3 pages) Or a “Nature Letter”.
- Stylistic requirements:
  http://www.sciencemag.org/authors/instructions-preparing-initial-manuscript
  http://www.nature.com/nature/authors/gta/index.html?foxtrotcallback=true

How is the final report graded?
- Standard grade is 6
- If the topic is original, +1
- For each aspect that is particularly well done, +1/2 or +1
- For aspects that are sub-standard, -1/2 or -1
- Particular attention: SOM, reproducibility, originality, conciseness and presentation
- I will place some example reports online
Organization of the course:

First half of the course:
- 6 Lectures devoted to topics in Monte Carlo
- 2 lectures devoted to statistics
- Exercise sessions: opportunity for you to ask feedback and support
  (but don’t ask “what should I do”)
- Work on draft report

Second half of the course:
- Oral presentations (your and other’s)
- Complete the final report

Important dates:
- Determining groups: tomorrow
- Deadline for draft report Oct. 20, 23:59h
- Presentations in final 2 or 3 weeks of the course
- Deadline final report Nov. 10, 23:59h
Obligatory presence:
- You are expected to attend the lectures. I don’t keep track of presence, but will not repeat things that you missed because of absence.
- Exercise sessions in first part: only if you have something to ask (w/o questions, teacher leaves!)
- You are expected to attend other student’s oral presentations

Your teachers:
- Gerard Barkema
- Debabrata Panja
- Marinus Veldhorst
- Frank Staals
- Sergey Sosnovsky

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