Problem Solving in Computer Science

A course dedicated to PhD students and to research-oriented Master students

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Course Objectives

- hone the problem solving skills of young researchers in computer science.
- explain the "research enterprise" in computer science to beginning doctoral students.
- apply the creative and scientific skills of the participating students to an embedded system engineering problem.

Course Organisation

Three interleaved parts

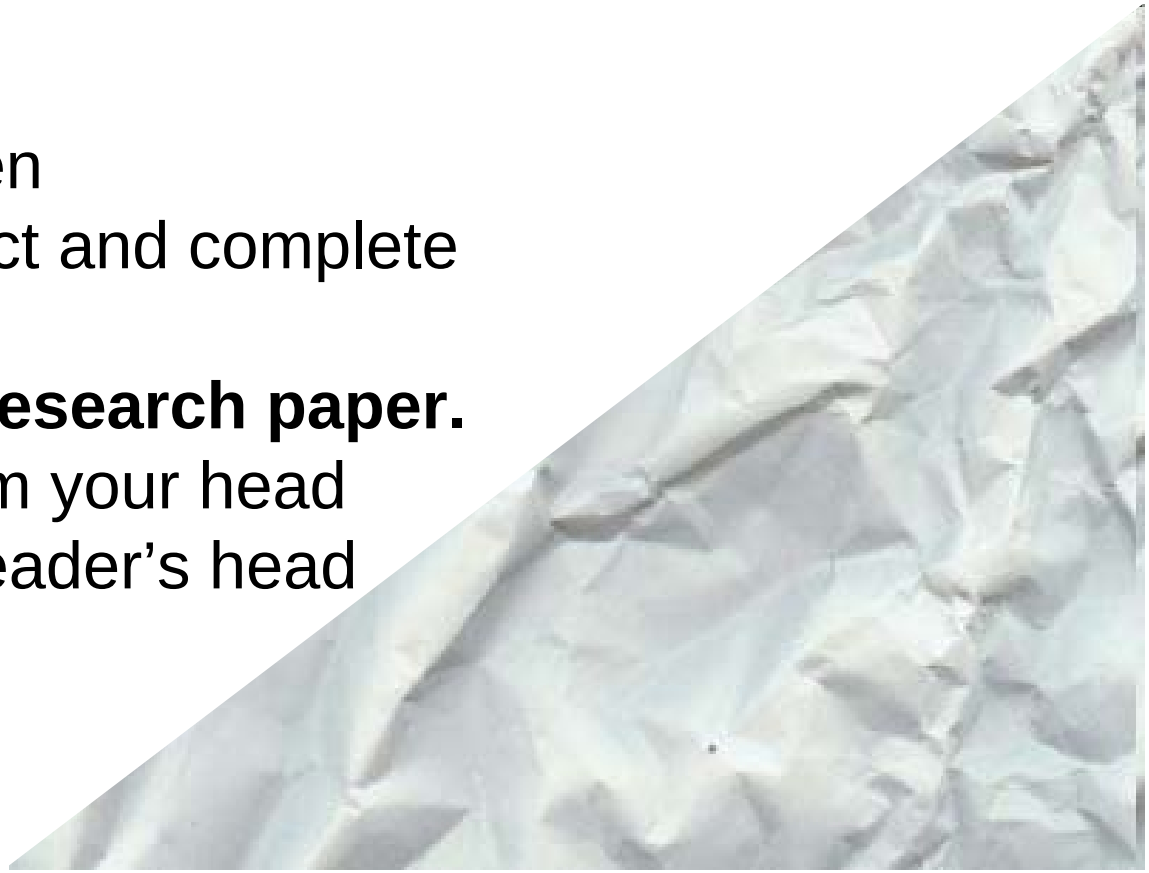
- 3 group projects (size 3-4) of 3 weeks length each.
- Lectures and exercises on
  - How to define a problem.
  - How to write a proof.
  - How to write a paper.
  - How to have a career in academia.
  - How to referee a paper.
  - How to give a presentation.
- Design of a common engineering artefact.

Lecture contents

- **How to formally define a problem.**
  - imprecise description in mind
  - neccessary to explain problem in paper/thesis
  - enhances understanding
  - eases finding solution & explanation

- **How to write a proof.**
  - claims must be proven
  - proofs must be correct and complete

- **How to write a great research paper.**
  - convey your idea from your head to your reader's head
  - language and style



Lecture contents (cont.)

- **How to have a bad career in research/academia (and alternatives).**
  - writing tactics
  - selecting topics
  - performing the research

- **How to referee a paper.**
  - quality control
  - ethics
  - common dilemmas
  - judge technical writing

- **How to give a good research talk.**
  - what to say
  - visual aids
  - giving the talk

Group projects

- driven by final engineering design problem
- comprise foundational and practical aspects
- exploit
  - research interests
  - organsation talents
  - team spirit

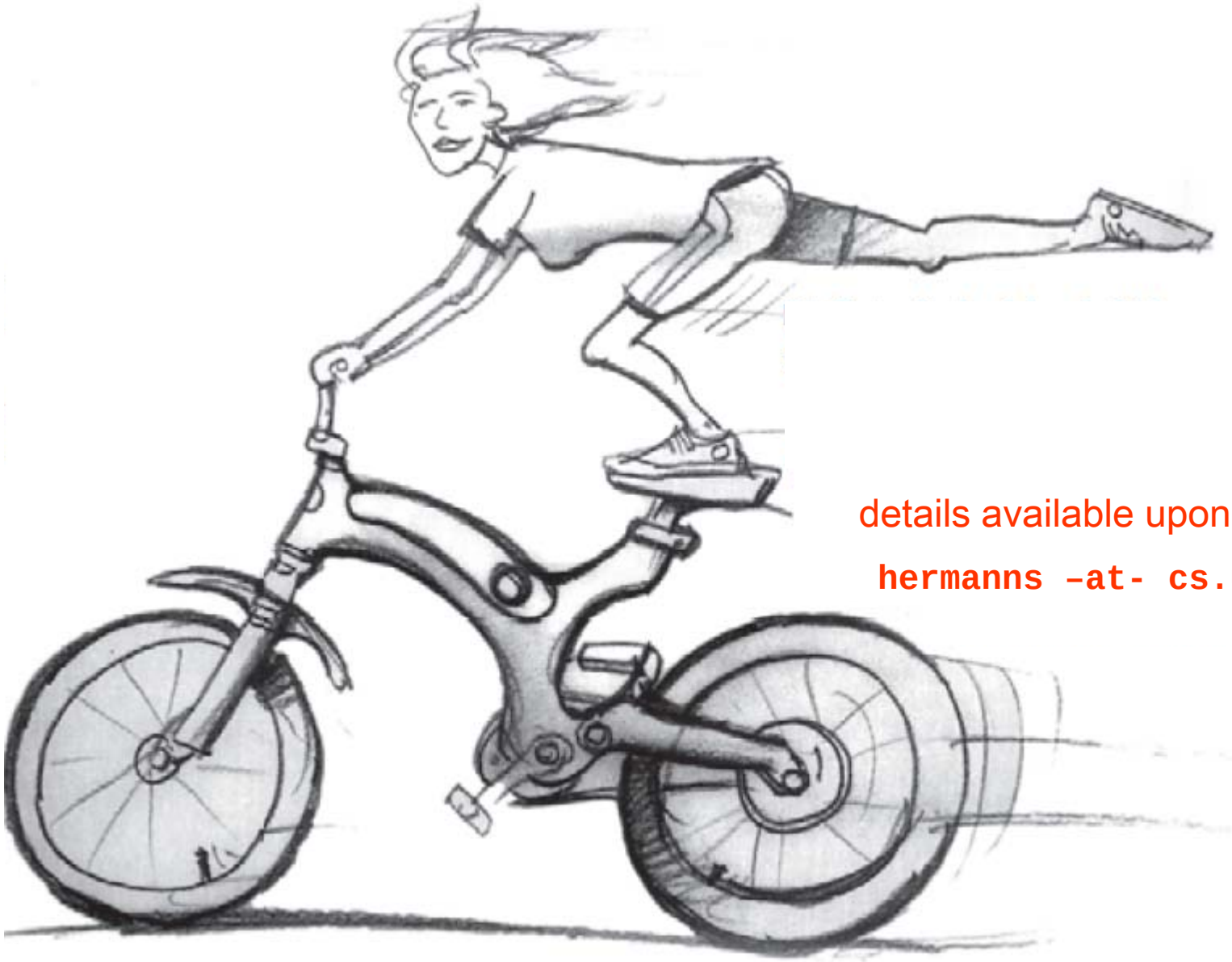
Engineering design problems?

It‘s all about energy

and about embedded systems

A large embedded system design problem

A small embedded system design problem



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