Neuroinformatics:
Impressions from a Computer Scientist

Arno Siebes

Computer Science

Computer Science has a new kind of customer:

The Sciences

- Bioinformatics
- Astro-informatics
- Neuroinformatics

And we are deeply happy with that!

Caveat

- However, applying IT is *not* the same as Computer *Science*
- For academic interest, fundamentally new problems should have to be solved
- The rest is engineering (which does *not* mean that it is easy!)
- Computer Scientists could help in pointing out how to solve problems

Jaaps Workplan: Engineering

- developing technical structure such as
  - databases
  - infrastructure
- developing conceptual structure such as
  - Guidelines
  - Standards
  - Ontologies

A final note on Engineering

- The engineering problems should, of course, be solved.
- Not by academic computer scientists, but there are lots of knowledgeable people that can consult.

Jaaps Workplan: Science

- Data analysis, visualization, data mining, machine learning...
- computational models
- simulation

Some Characteristics

Certainly not complete:

- Images and pattern recognition in images.
- Reconciling models on different levels of detail/space/time
- Using data from different sources (fMRI and EEC)
- Many dimensions and large amounts of data

But is this Unique?

- Robert Cannon compared against Astronomy, but what if he had compared against *omics?
- There is lots of ongoing work on problems with these characteristics:
  - Large bioinformatics programs
  - Large Multimedia projects
  - Large Computational Science programs (esp. modelling and simulation)

Perhaps

- There is not enough funding to the necessary imaging etc research
- An integrative program offers possibilities that go over these "traditional" borders
- Do you want fundamental CS research (as in CLS) or do you want fundamental Neuro research (as in IOP Genomics)?