

Introduction to Cognitive Models

Selectable PhD course in methodology, 7.5 credits

Syllabus

Goal

After taking this course, the student will:

1. Understand the importance of models in cognitive psychology
2. Be familiar with a range of different types of models used in cognitive psychology
3. Find it easier to read psychology papers that use models
4. Be able to design and fit simple cognitive models
5. Have a basic understanding of model comparison methods

Contents

Lectures will cover the following themes: introduction, deterministic models, signal-detection theory, probabilistic models, optimal-observer models, neural models, model comparison methods.

Course materials will be illustrated with examples from the cognitive psychology literature, including the Weber-Fechner model, Steven's power law model, prospect theory, a Bayesian model of visual search, the slot model of working memory, and the resource model of working memory.

Teaching

The course will be given in English and consist of lectures, lab sessions, and paper discussions.

The lab sessions and paper discussions will connect to materials discussed earlier in the lectures. For example, the lecture about deterministic models may be followed by both a lab session in which students will fit the Weber-Fechner law and Steven's power law to a simple data set and a paper discussion about literature related to these laws. This way, students are presented with each of the main topics three times in different ways, which should increase their understanding and consolidation of the materials.

Since this is an introductory course, the materials will be presented in a way that requires no advanced mathematical knowledge or programming experience. All math will be introduced slowly and intuitively.

Examination

There will be a take-home exam, which is aimed at testing the student's general understanding of the materials. In addition, students will hand in short reports of their solutions to the lab session assignments and be present at the paper discussion sessions. The final grade will be based for 50% on the exam and for 50% on the lab reports.

Literature

The literature will consist of a syllabus (produced by the course instructor), journal papers, book chapters, and freely available online resources.