university of groningen

groningen spring school cognitive modeling

What

ACT-R, Nengo, PRIMs, & Accumulator Models

When

April 3-7, 2017

Early registration deadline:
February 15, 2017

Where

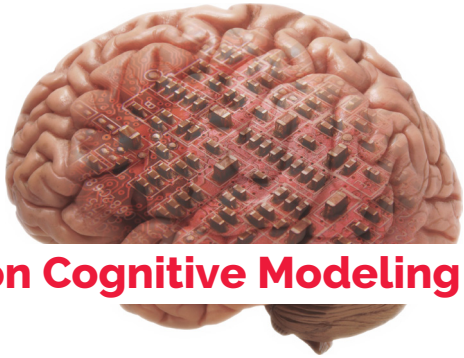
Groningen
The Netherlands

For the second time, the Groningen Spring School on Cognitive Modeling will cover four different modeling paradigms: ACT-R, Nengo, PRIMs, and Accumulator models (see back for more info). It thereby offers a unique opportunity to learn the relative strengths and weaknesses of these approaches.

Each day will consist of four theory lectures, one on each paradigm. Each modeling paradigm also includes hands-on assignments. Although students are free to chose the number of lectures they attend, we recommend students to sign up for lectures on two of the modeling paradigms, and complete the tutorial units for one of the paradigms. At the end of each day there will be a plenary research talk, to show how these different approaches to modeling are applied.

The Spring School will be concluded with a keynote lecture by Sander Bohte.

Admission is limited, so register soon on www.ai.rug.nl/springschool



www.ai.rug.nl/springschool

Groningen Spring School on Cognitive Modeling

ACT-R

Teachers: Jelmer Borst, Hedderik van Rijn, Katja Mehlhorn (University of Groningen)
Website: http://act-r.psy.cmu.edu

ACT-R is a high-level cognitive theory and simulation system for developing cognitive models for tasks that vary from simple reaction time experiments to driving a car, learning algebra, and air traffic control. ACT-R can be used to develop process models of a task at a symbolic level. Participants will follow a compressed five-day version of the traditional summer school curriculum. We will also cover the connection between ACT-R and fMRI.

Nengo

Teacher: Terry Stewart (University of Waterloo)
Website: http://www.nengo.ca

Nengo is a toolkit for converting high-level cognitive theories into low-level spiking neuron implementations. In this way, aspects of model performance such as response accuracy and reaction times emerge as a consequence of neural parameters such as the neurotransmitter time constants. It has been used to model adaptive motor control, visual attention, serial list memory, reinforcement learning, Tower of Hanoi, and fluid intelligence. Participants will learn to construct these kinds of models, starting with generic tasks like representing values and positions, and ending with full production-like systems. There will also be special emphasis on extracting various forms of data out of a model, such that it can be compared to experimental data.

PRIMs

Teacher: Niels Taatgen (University of Groningen)
Website: http://www.ai.rug.nl/~niels/actransfer.html

How do people handle and prioritize multiple tasks? How can we learn something in the context of one task, and partially benefit from it in another task? The goal of PRIMs is to cross the artificial boundary that most cognitive architectures have imposed on themselves by studying single tasks. It has mechanisms to model transfer of cognitive skills, and the competition between multiple goals. In the tutorial we will look at how PRIMs can model phenomena of cognitive transfer and cognitive training, and how multiple goals compete for priority in models of distraction.

Accumulator Models

Teachers: Marieke van Vugt, Don van Ravenzwaaij (University of Groningen), & Martijn Mulder (University of Amsterdam)

Decisions can be described in terms of a process of evidence accumulation, modeled with a drift diffusion mechanism. The advantage of redescribing the behavioral data with an accumulator model is that those can be decomposed into more easily-interpretable cognitive mechanisms such as speed-accuracy trade-off or quality of attention. In this course, you will learn about the basic mechanisms of drift diffusion models and apply it to your own dataset (if you bring one). You will also see some applications of accumulator models in the context of neuroscience and individual differences.