

# Cognitive Science

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## Lecture 1: Connectionism

Topics covered: Associative learning via the Rescorla-Wagner rule. Connection to other error driven learning rules. Using networks as classifiers. More complex networks and pattern matching.

- Slides in PowerPoint (lecture1\_connectionism.pptx) format
- Slides in PDF (lecture1\_connectionism.pdf) format

## Lecture 2: Statistical learning

Topics covered: Introduction to Bayesian reasoning. A model for judging coincidences. Comments on conservative belief updating. A model of the perceptual magnet effect. Bayesian program induction for concept learning.

- Slides in PowerPoint (lecture2\_statisticallearning.pptx) format
- Slides in PDF (lecture2\_statisticallearning.pdf) format

## Lecture 3: Semantic networks

Topics covered: Semantic priming and spreading activation. The small world of words project. Local network structure. Predicting remote associations. Structure of semantic networks. Developmental trajectory

- Slides in PowerPoint (lecture3\_semanticnetworks.pptx) format
- Slides in PDF (lecture3\_semanticnetworks.pdf) format

## Lecture 4: The wisdom of crowds

Topics covered: Galton's vox populi. Surowiecki's criteria. Wisdom of crowds for ranking data. Example from category learning. Wisdom of crowds in combinatorial optimisation problems. Compensating for strategic behaviour. Application in forensic science

- Slides in PowerPoint (lecture4\_wisdomofcrowds.pptx) format
- Slides in PDF (lecture4\_wisdomofcrowds.pdf) format

## Lecture 5: Cultural transmission

Topics covered: The iterated learning paradigm. Theoretical argument that it reveals inductive biases. Illustration with function learning task. Limitations when individual differences exist. Cumulative cultural evolution in a language game.

- Slides in PowerPoint (lecture5\_culturaltransmission.pptx) format
- Slides in PDF (lecture5\_culturaltransmission.pdf) format

## Lecture 6: Summary

Classroom discussion, no slides