



Applied Cognitive Neuroscience

A large, stylized graphic of a human eye, rendered in shades of grey and blue, positioned in the lower-left quadrant of the slide. The eye is looking towards the right.

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Let's start with an example
Radiology

Scanners and Drillers

Characterizing Expert Visual Search through Volumetric Images

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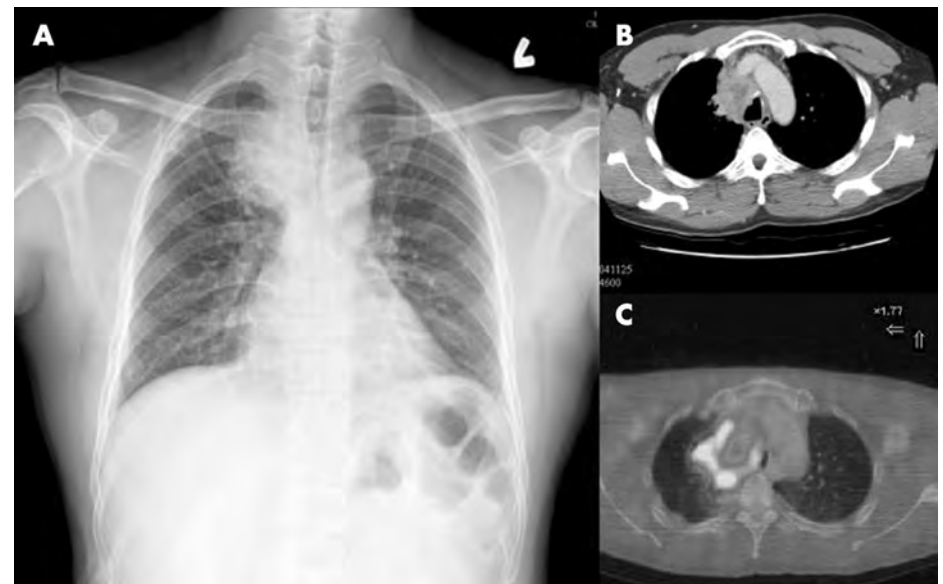
¹ Brigham & Women's Hospital

² Harvard Medical School

³ MIT Media Lab

More effective radiology

- How can we use cognitive neuroscience to understand how radiologists work?
- And how can we use this to improve their efficiency?
 - Feedback?
 - Artificial intelligence?



Another example

Learning

Learning effectively

- Say that you're learning Chinese
- You've just learned a new word
 - 学生 → Student
- If you don't repeat this word, you'll forget it
- But if you repeat it right away, you won't learn effectively either
- When should you repeat a word that you've just learned?



Learning effectively

- One of our colleagues in Groningen designed an algorithm to find the optimal moment to repeat items during learning
- Based on
 - Response times
 - Electroencephalography
 - Computational modeling
- This *substantially* improves learning
- Now widely used in schools for fact learning
- And as *formative testing* at universities



Formative testing



Chapter 1: The Science of Psychology



by sebastian

SHOW STATISTICS 

Visibility

public

Description

Answers consist of one ("___"), two ("___ ___"), or three ("___ ___ ___") words. Enter each word in lowercase without punctuation.

Question type

Typing

Practice time

0



20

8 minutes

START PRACTICING

Another example

Traffic safety



Beelden VID: Meer info op vid.nl

Making traffic safer

- How can we use cognitive neuroscience to understand what happens?
- And how can we translate this to improved traffic safety?



What is Applied Cognitive Neuroscience?

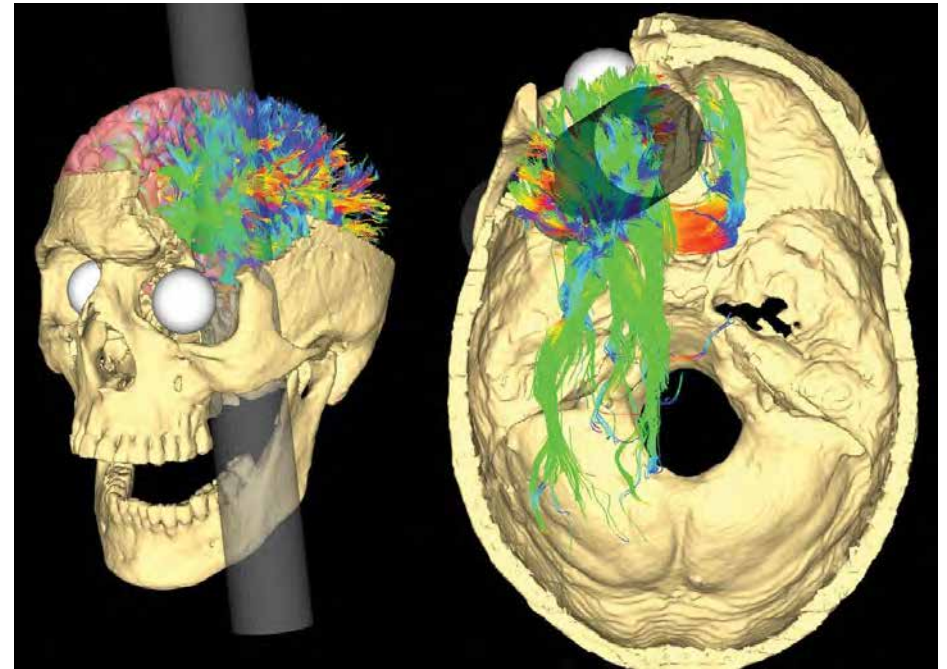
What is ACN?

- Study of cognition
- Emphasis on applications
 - How can we apply fundamental research to the real world?
 - Different from research masters
- Emphasis on state of the art methods
 - Eye tracking
 - Neuroimaging/
electrophysiology
 - Data science



What is ACN?

- Emphasis on healthy people
 - How do fundamental cognitive processes work in the healthy brain?
- Different from (clinical) neuropsychology
 - Focus on diagnosis and treatment of neurological illnesses



What is ACN?

- Taught in English
- Small scale (15 – 30 students)
- Interaction between students and staff



Curriculum

- Courses
 - 0.5 y / 30 EC
 - Theory
 - Skills and methods
- Master thesis / Internship
 - 0.5 y / 30 EC
 - Research project
 - Internship
 - Free to emphasize the one or the other



Trends in Cognitive Neuroscience

- You will learn
 - About the latest findings from cognitive neuroscience
 - How to critically evaluate research
 - About the difference between corporate and academic research



Applied Cognitive Neuroscience

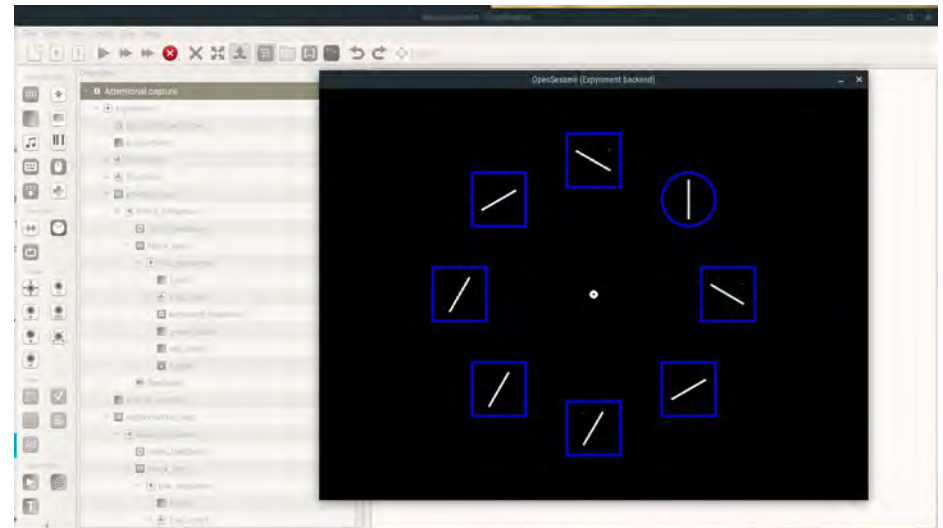
- Builds on the fundamental knowledge that you've learned in *Trends in Cognitive Neuroscience*
 - And brings this to the real world
- You will learn
 - To apply research from cognitive neuroscience to real-life applications
 - To develop your own applied research project



Data Collection and Analysis

for Cognitive Neuroscience

- You will learn
 - How to implement cognitive-neuroscience experiments
 - How to collect data
 - How to analyze data
- A hands-on course!
- Crucial skills in today's job market



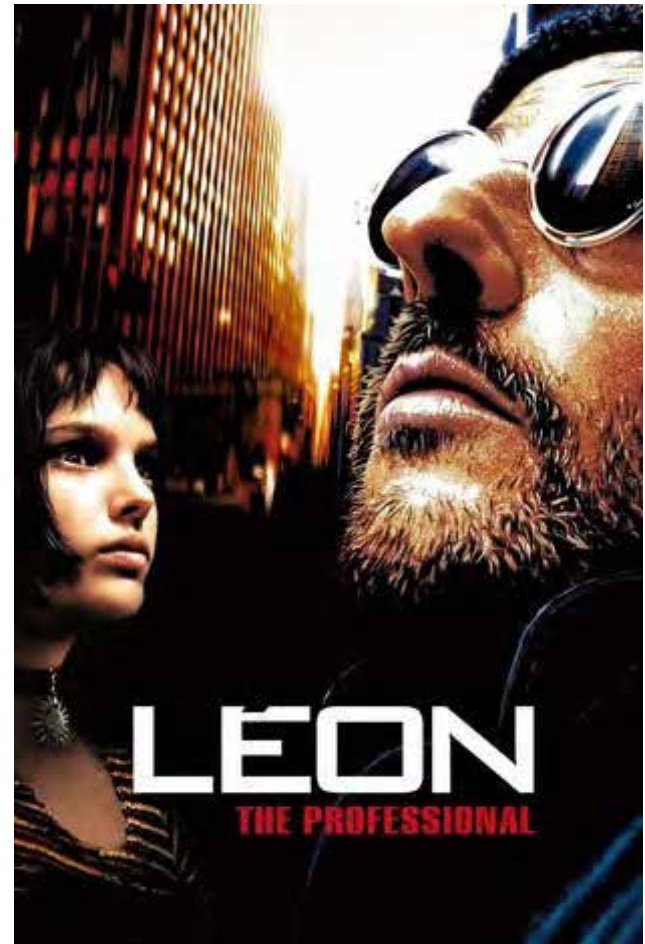
Master thesis

- Work on your own research project
 - Design experiment
 - Collect data
 - Analyze data
 - Write a thesis
- Direct supervision by active research



Internship

- Apply your knowledge in a professional setting
- Considerable flexibility
 - Work in a company that uses human data
 - Participate in organizing a symposium or conference
 - Etc.
- Your own responsibility to find an internship (with our help)



Career perspectives

- Data analysis
- Marketing
- Consultancy
- Software development
- Corporate R&D
- Academia (PhD student)





<https://www.rug.nl/masters/applied-cognitive-neuroscience/>

Questions?

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