Methods
to bring the human in the loop

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What is the course about?

Going deep into **studies involving humans**

Not the (more general) course
on *Scientific Methodology and Experimental Evaluation*
https://mosig.imag.fr/SMEE/SMEE

What is the course about?

Going deep into **studies involving humans**
⇒ can apply to other fields

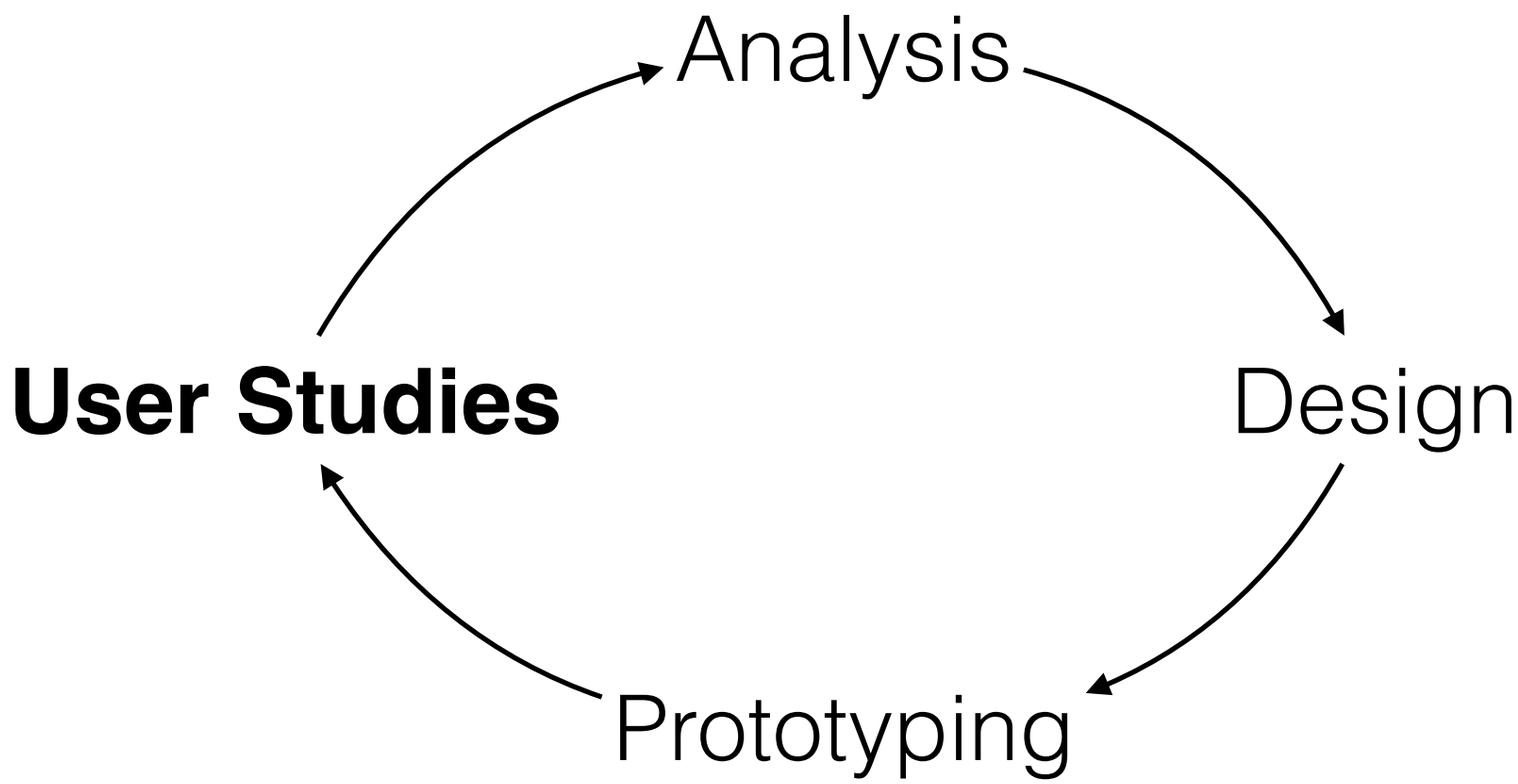
e.g., comparing the performance
of a recognition system to human performance

Not on user-centered design → <u>1st year of Master</u>
e.g., utility, usability, users' needs, etc.

Studies with humans: Objective

To gain knowledge about what happens with humans and/or a computer system

Typical cycle



User studies

Researchers (from Human-Computer Interaction or other fields)
cannot ignore human variability

- Among humans
- Among trials for a single human

$\Longrightarrow$ Use statistics

$\Longrightarrow$ Control studies

User studies

1. (Form hypothesis)
2. Collect data
3. (Analyze)

Collect Data

Quantitative

Qualitative

Quantitative vs. Qualitative

- Experiment
- Correlational observation
- Questionnaire
- etc.

- Focus group
- Ethnography
- *In situ* observations
- Interviews
- etc.

Collect Qualitative Data: Ethnography

(not necessarily *in situ*)

- Describe as if you arrive from outer space

- Extensive notes about
  behaviors, events, setting/context

- Avoid interpreting

Collect Qualitative Data: Ethnography

F1: like what is this then?
F2: is [is like this sorta- thing
F1: [{takes hold of artist-bubble}
M1: {activates a venue bubble, multiple artist bubbles are pulled towards center}
F1: {scales up artist bubble}
F2: oh watch out (.) for him now
M1: {looks left towards girls}
F1: [{hovers index finger above text}
F1: [this (.) I dunno-
F2: ↑how? this is fu:n? (.) look?
F2: {tries to move venue bubbles but fails}
F2: how can these be- what can I do with this
F2: {slowly moves one venue bubble up}
{steps back}
F2: £this isn't working out
M1: {EXIT}
F2: @Veeti Kallio@ ((artist name))
(10.0) ((F1 & F2 silently browse and move the content bubbles))
F2: how can you like- (.) I'm LOOSING MY MInd
F2: [{trying to push bubbles to the right}
[@wauuh (.) @aaah (.) ((laughter))
F1: {walks right, next to day-search bubble}
F1: here is Sunday and tomorrow's program
F2: Kirjurinluoto Jeff Beck ((reading aloud))

Collect Qualitative Data: *In situ* observations

In situ or naturalistic observations

- Not to distord users behavior

- Can be used to suggest hypothesis
  for further controlled, quantitative experiment

Collect Quantitative Data: Experiment

Circumstance(s) ← **relationship**? → **Behavior(s)**

e.g. experience,
device,
etc.

e.g. rapidity,
etc.

Aim: predict future behavior under *similar* circumstances

Collect Quantitative Data: Experiment

Circumstance(s) ← **relationship**? → **Behavior(s)**

e.g. experience,
device,
etc.

e.g. rapidity,
etc.

1. Choose a circumstance to manipulate
2. Let the other circumstances vary

Collect Quantitative Data: Experiment

Circumstance(s) ← **relationship**? → **Behavior(s)**

e.g. experience, device, etc.

e.g. rapidity, etc.

Measure

Collect Quantitative Data: Experiment

Circumstance(s) ← **causal** relationship? → **Behavior(s)**

e.g. experience,
device,
etc.

e.g. rapidity,
etc.

Collect Quantitative Data: Correlational observation

Circumstance(s) ← **relationship**? → **Behavior(s)**

e.g. experience,
device,
etc.

e.g. rapidity,
etc.

Collect Quantitative Data: Correlational observation

Circumstance(s) ← **relationship**? → **Behavior(s)**

e.g. experience,
device,
etc.

e.g. rapidity,
etc.

Cannot easily manipulate circumstance(s)
e.g., emotional state

Collect Quantitative Data: Correlational observation

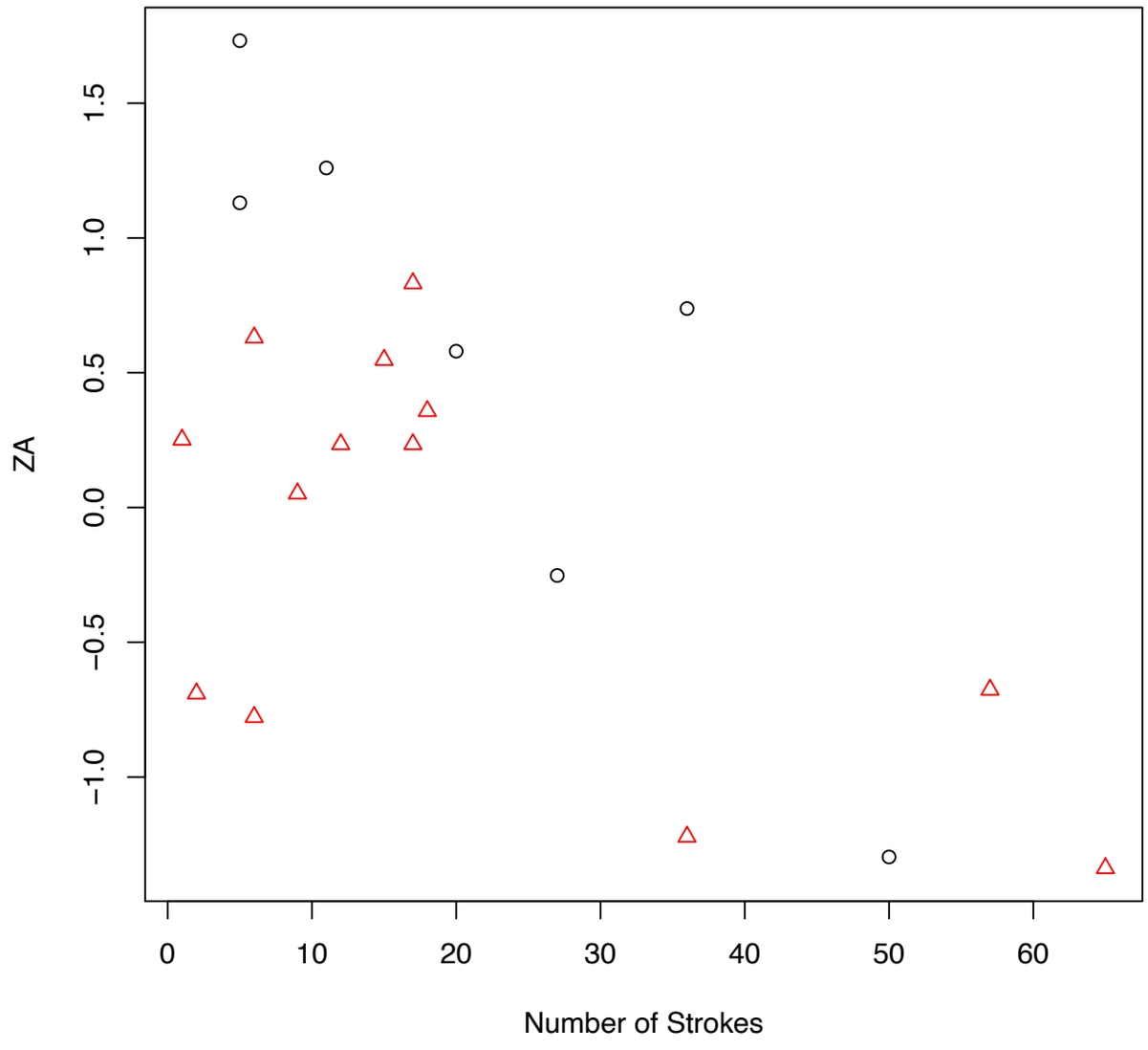
Circumstance(s) ← **relationship**? → **Behavior(s)**

e.g. experience, device, etc.

e.g. rapidity, etc.

Measure

Collect Quantitative Data: Correlational observation



Collect Quantitative Data: Correlational observation

Circumstance(s) ← ~~**causal**~~ **causal** relationship? → **Behavior(s)**

e.g. experience,
device,
etc.

e.g. rapidity,
etc.

Quantitative vs. Qualitative

- Experiment
- Correlational observation
- Questionnaire

→ **Little amount of data**

→ **Can be used to establish (causal) relationships**

- Focus group
- Ethnography
- *In situ* observations
- Interviews

→ **Large amount of data**

→ **Cannot be used to establish (any) relationships**

Quantitative vs. Qualitative

Researchers often use both

- Qualitative studies allows for insights
- Quantitative studies allows replication

Assignments: Learning by doing

Assignment #1

- **October 4th (today)**:

    1. Choice of review topic

    2. Forming groups of 2 students
    (*different from François' final project)*

- **October 18th**:
  Autonomous work with teacher help
  ASK FOR FEEDBACK/HELP before too late

- **November 15th (after the autumn break)**:
  Final presentations for this assignment
  (1/4 of the final grade)

Assignment #1

Review topics to choose from:

- AB testing
- Contextual interviews
- Emotions
- Just-noticeable difference
- Usability questionnaires
- Cognitive load
- Workshops

Assignment #1

Nov 15th presentation guidelines:

- Duration of presentation: 15min
- Important points:

1. Objectives of the experimental methods (what does it allow to evaluate?)

2. Explanation of the experimental methods

3. How should we conduct such a study?
   Demonstration/Illustration with one example
   Present quickly other papers using the same or similar method: what are the differences?

4. Benefits and Drawbacks of the experimental methods

5. Sources

Assignment #2: application on your project

- *Different* group of two students (already done with François)

- Apply a 2nd, *different* method to your project

- Autonomous work with teacher help

- **Exam week**:
  Final presentations of project