



Scoping your HCAI project

The 'AI' in HCAI

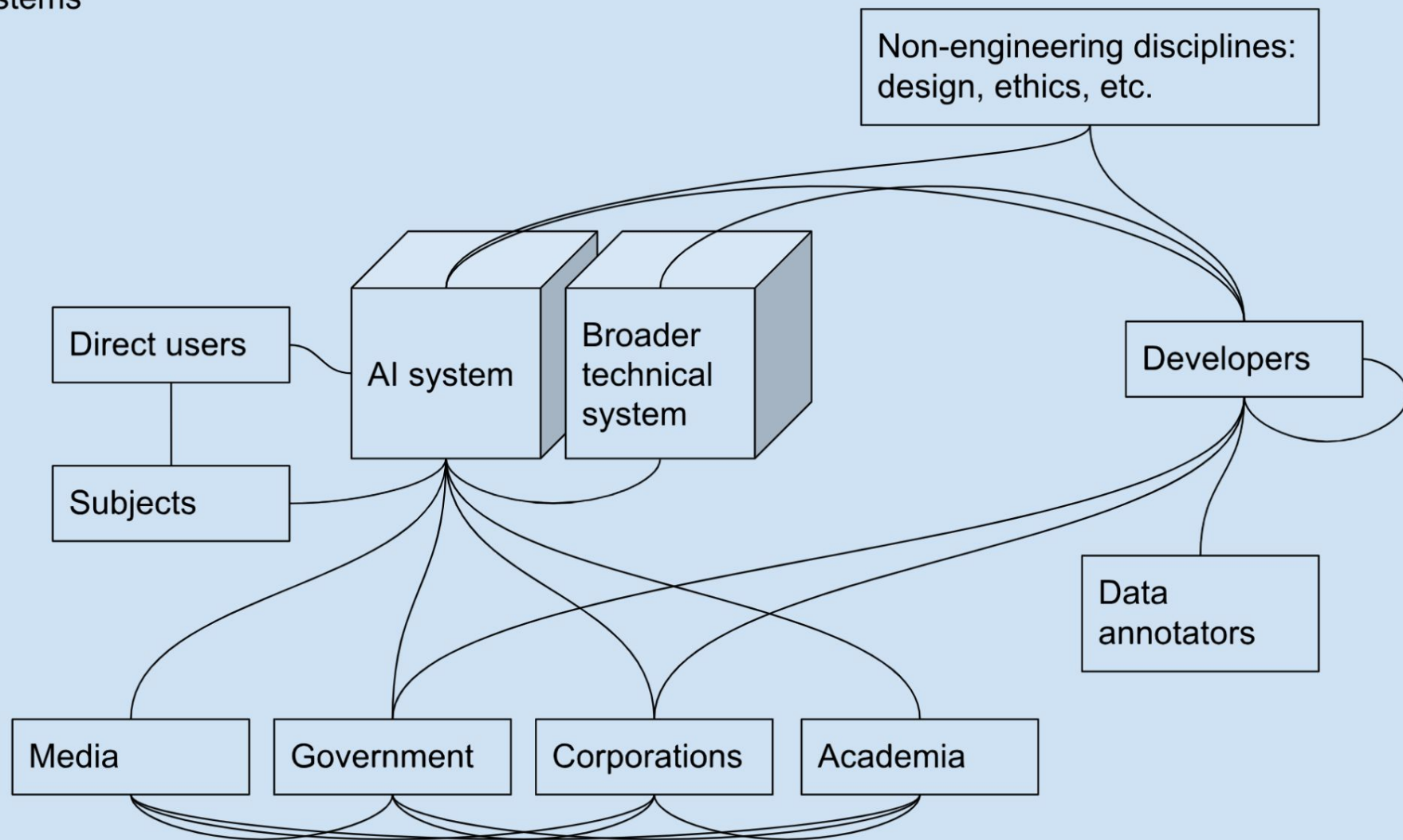
The research question must be specific to issues of concern in artificial intelligence

- Could the RQ be answered if the system was not branded as “AI”?
- If yes, what is the additional nuance or difference from AI?
- How will you design your study to target this nuance?
 - E.g., “challenges faced by software developers in building AI.”

The 'HC' in HCAI

There are *many* human
actors
and stakeholders in
AI ecosystems!

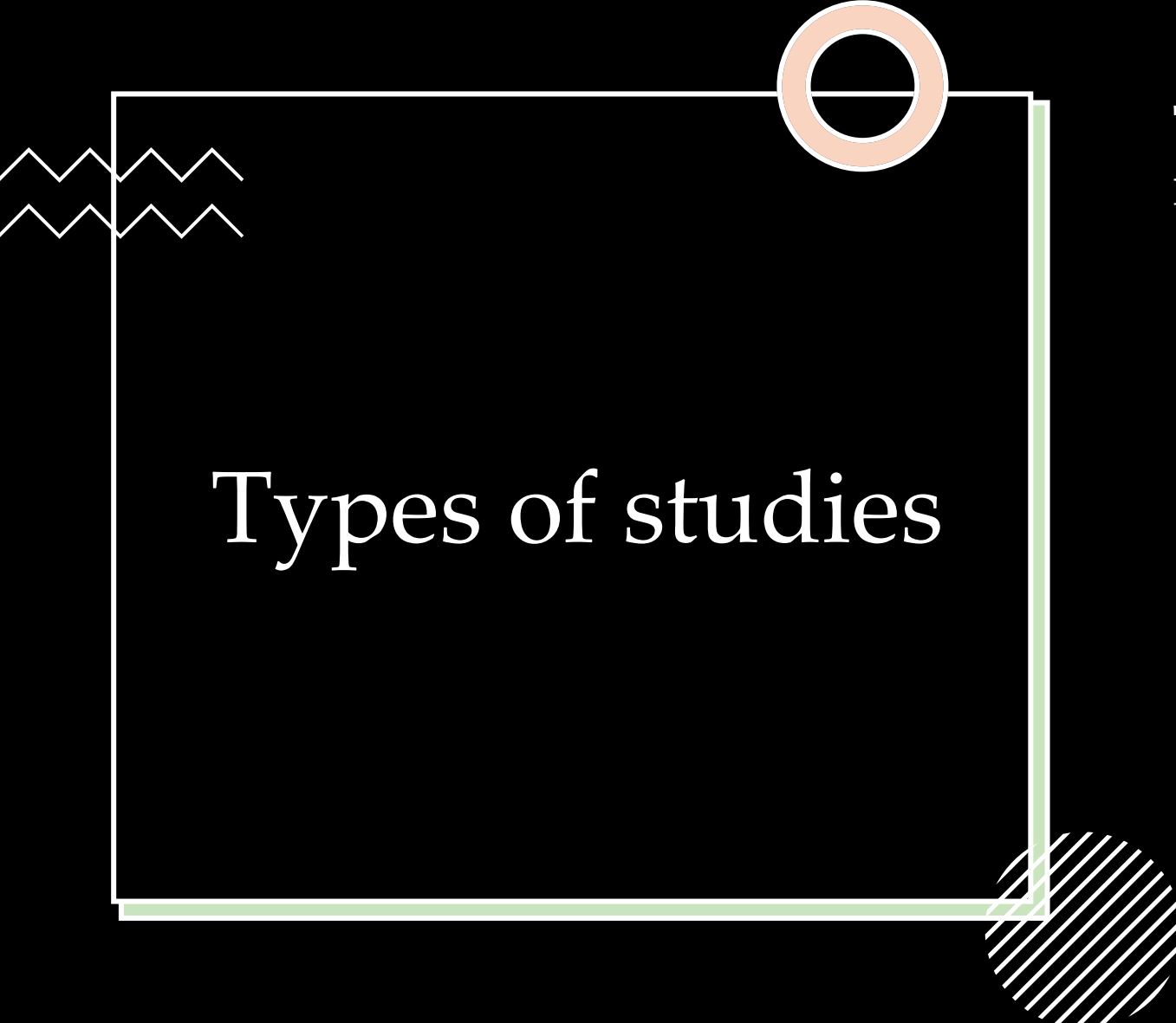
Power flows in AI systems



Generative AI

Most of our taught examples use “older” types of AI. e.g., Naive Bayes, decision trees, k-NNs, SVMs, older neural networks (CNNs, RNNs, etc.), or symbolic methods

- This is important because:
 - humans change more slowly than technology (e.g., uncertainty, trust & reliance, agency & control)
 - understanding how the field has evolved is important to participate in it
 - ... and this, too, shall pass
- Your project *does not have to be about GenAI*



Types of studies

There are many ways to investigate a research question

- Surveys
- Interviews
- Analysis of online corpora
- Design probe
- Controlled experiment
- Telemetric study

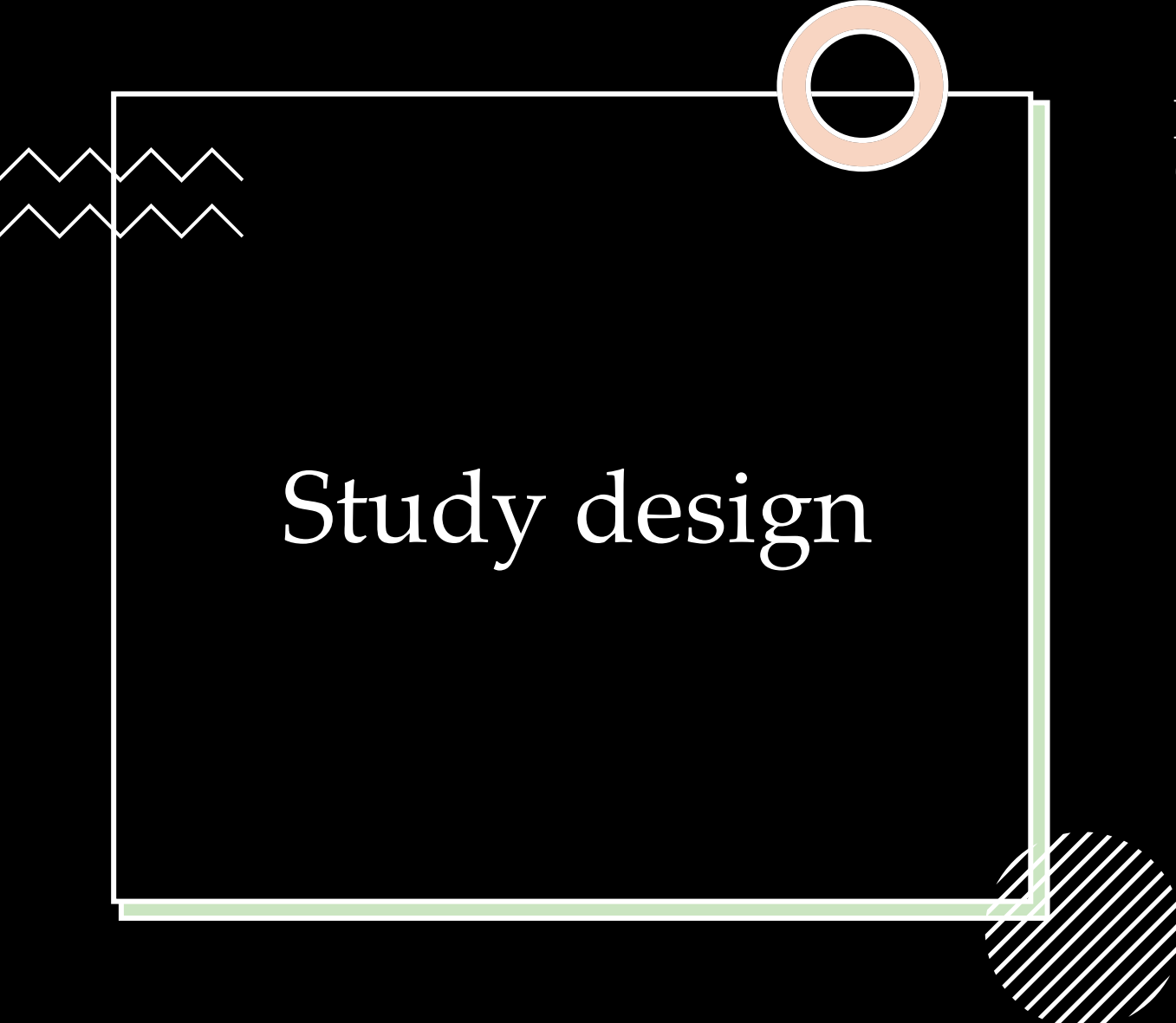
Materials for a study

Will you be building something? What will you build?

- Low/medium fidelity mockups (sketches, slideshows)
- Wizard of Oz prototyping
- Off-the-shelf products
 - With interventions
 - You need to be able to influence variables that are of interest, and control others that are not.
- Functional prototype(s)

Some successful past projects

- Assessing public perception of self-driving cars: the autonomous vehicle acceptance model
 - Charlie Hewitt: ACM IUI, 190+ citations
- Comparative judgments are more consistent than binary classification for labelling word complexity
 - Sian Gooding: ACL LAW
- Perceptions of chatbots in therapy
 - Samuel Bell: ACM CHI, 50+ citations
- Do we need natural language? Exploring restricted language interfaces for complex domains
 - Jesse Mu: ACM CHI



Study design

If you have never studied HCI
(or psychology / social science)

- Take a look at RSP slides on Research Design for Human Participants
- Review Part 1b Further HCI
 - hypothesis testing experiments and statistics
 - qualitative data analysis methods

Decisions and choices you will make:

- Research design turns a research *question* into a research *project*
- Research designs may be *fixed* or *flexible* (open or closed questions)
- Fixed questions are often associated with collection of *quantitative* data
- Flexible questions are often associated with *qualitative* data
- Fixed questions may involve *evaluation* on some criterion
- Flexible questions can identify unknowns, and even “unknown unknowns”

We will discuss threats to validity:

- Face validity
 - Does the superficial appearance of the study reflect its actual purpose?
- Construct validity
 - Does your data really measure what you say it does?
- Internal validity
 - Did the measured effects actually result from the suggested causes?
- External validity
 - Can your (controlled/sampled) results be applied to other contexts?

All projects will require ethical review:

- Study the Cambridge Technology Ethics guide
 - What kind of study are you planning?
 - What potential concerns might there be?
 - What will you do to address them?
- Submit a proposal to the Computer Science Ethics committee, giving above details
 - <https://dbwebserver.cl.cam.ac.uk/Administration/Ethics/EthicsRequest.aspx>
 - (accessible from department VPN, using department login not Raven)

Review of feedback timetable

(submit each Monday: Part II by noon, ACS/PtIII by 4pm)

- Week 2 - Research question (200 words) + a sample diary entry
- Week 3 - Study design (400 words)
- Week 4 - Another sample diary entry
- Week 5 - Draft literature review for final report (400 words)
- Week 6 - Draft introduction to report (200 words)
- Week 7 - Draft results section for report (400 words)
- Week 8 - Draft discussion section for report (200 words)
- + keep up with diary entries every week (ACS/PtIII) – not graded, but collect together, with a summary, into single PDF at course end.