Building the Infinite Brain

COMP 590/790 Special Topics

Homework 1

1-page response (+1 for graduates/review) due in class on 8/27

Write a 1-page summary of what you have learnt about BCIs, the role of computing in BCIs, and any technical information you have learned. Also mention applications that BCIs like the Infinite Brain can enable. Do these applications relate to your focus area, or what you aim to do? Remember to include any references.

Review: Critique the paper below, and describe under separate sections, (a) a summary, (b) the main contributions, (c) what is new in the paper over prior work, (c) what is significant about the paper's contributions, (d) limitations of the paper or what can be done to improve it, and (e) how does the paper influence our thinking about computer systems for the brain. Aim to be precise in your language. Some references on reading a paper are:

- "How to read a paper", S Keshav
- "Reading a (CS or EE) Research Paper", Philip Levis
- "Paper Reading", Lecture, Adam Lee

Viewing

- Father of the Cyborgs
  https://tubitv.com/movies/100021321/father-of-the-cyborgs

Reading

- The Unspeakable Odyssey of the Motionless Boy
  https://www.esquire.com/news-politics/a4972/unspeakable-odyssey-motionless-boy-1008/
- Scientists seek to help 'locked-in' man speak
  https://www.cnn.com/2007/HEALTH/conditions/12/14/locked.in/index.html
- The Neurologist Who Hacked His Brain—And Almost Lost His Mind
  https://www.wired.com/2016/01/phil-kennedy-mind-control-computer/
- Brain-Computer Interfaces
  https://worksinprogress.co/issue/brain-computer-interfaces/
- How Did We Get to This Point?
  https://www.cruxucla.com/single-post/2019/01/20/how-did-we-get-to-this-point

Research paper review

- An Accurate and Rapidly Calibrating Speech Neuroprosthesis
  https://www.nejm.org/doi/full/10.1056/NEJMoa2314132

(Ungraded) Suggested Reading at your own pace

- B1: Part 1, Part 2.Ch 1-3, 6
- B2: Ch 1-5, 9-11, 19-23
  If the equations and terminology are too dense, don't worry. Focus on the intuition and overall steps. We want to understand the math and neuroscience just enough to design our computers.