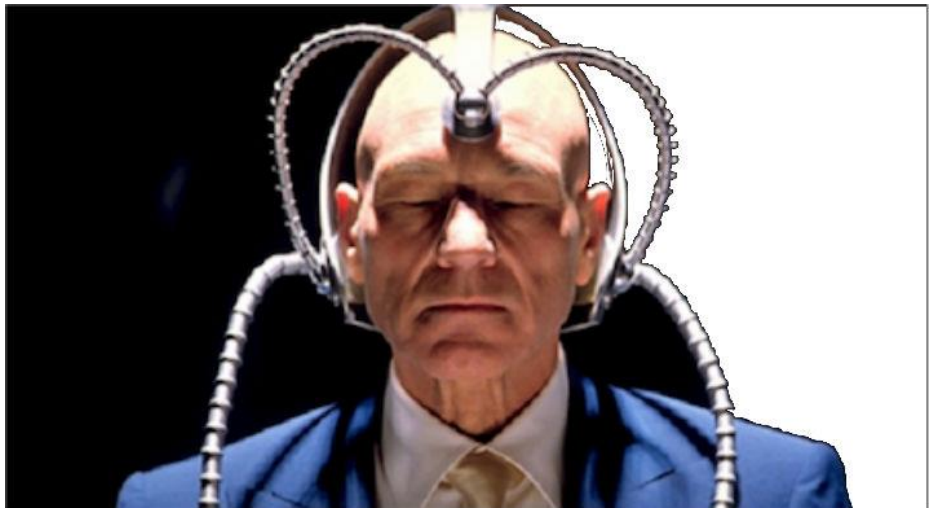
MIND READING

And not an esoteric stuff



Video

- Kedže nejde pridať prehraj z plochy ☺

What the hack they made?

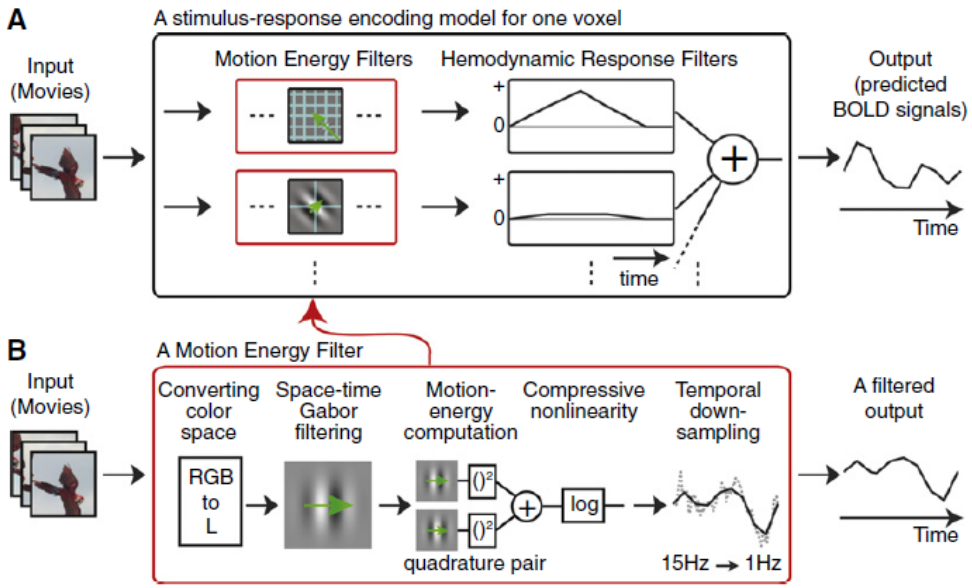
- First reconstruction of dynamic perceptual experience from BOLD signals
- fMRI= high spatial resolution
- Blood oxygen low-dependent signals (BOLD)= slow ones compared to natural vision
- Nashimoto and coleages disprove unusefullness of fMRI to mapping fast signals
- They create a methodology of switching between random sequence of clips so changes in visual cortex became more detectable

Experiment

- Only 3 human subjects viewing sequence of movies (15hz)
- 2 separate data sets
- Training data: 7200 s of youtube movies
- Build dictionaries (i.e., regression models) that translate between the shapes, edges and motion in the movies and measured brain activity. A separate dictionary is constructed for each of several thousand points at which brain activity was measured.
- Randomly select clips from youtube (18 000 000s, 5000h)
- Put each of these clips through the dictionaries to generate predictions of brain activity using Bayesian decoder.
- Select the 100 clips whose predicted activity is most similar to the observed brain activity. Average these clips together. This is the reconstruction.

How filters in model works

- 2 types of filters in motion-energy model: motion- energy filters and hemodynamic filters
- found out how changes of hemodynamics and energy- motion signals in certain space-time region of visual cortex depends on perceived stimulus (edges, shapes, motion in the movies)
- fit datasets in most accurate model



Original study

- Shinji Nishimoto, An T. Vu, Thomas Naselaris, Yuval Benjamini, Bin Yu, and Jack L. Gallant : Reconstructing Visual Experiences from brain Activity Evoked by Natural Movies, Current Biology 21, 1641–1646, October 11