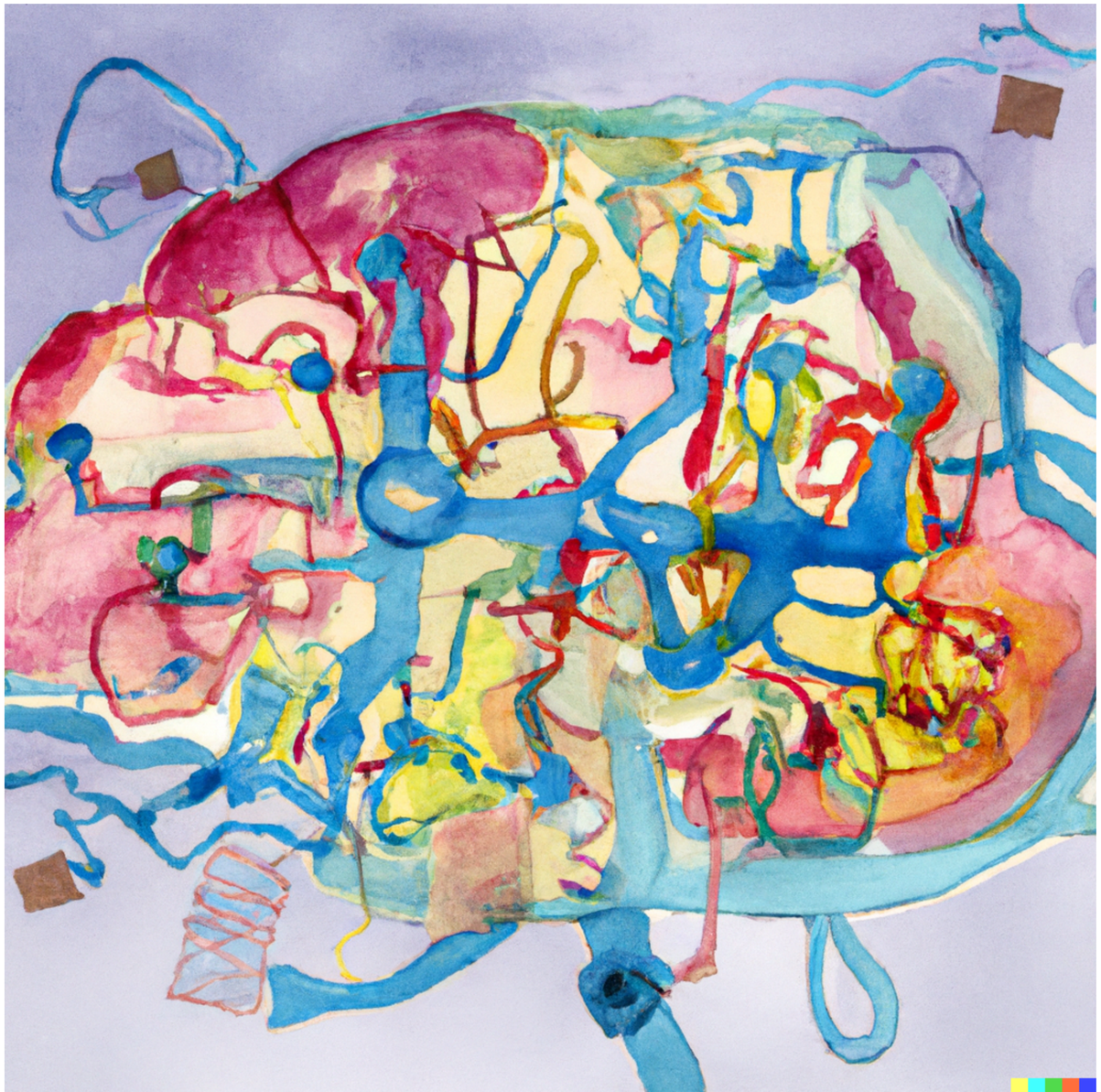


Introduction to NeuroAI

@Kordinglab

A map of NeuroAI



AI for neuro



- Human knows what to look for
- Data is big
- NeuroAI used to find pattern in data:
- Think: fit generalized linear model, decode movement intent from implant, characterize correlations, Procrustes alignment, Pose tracking

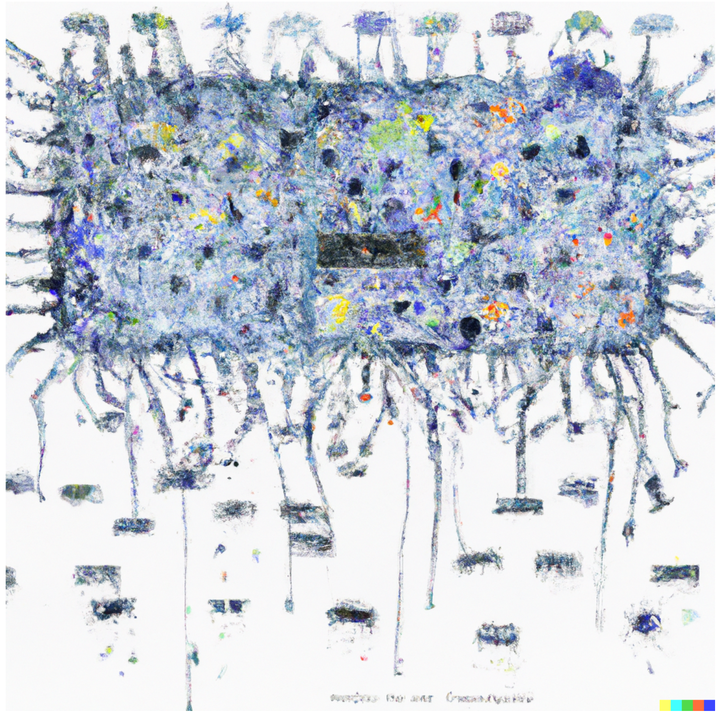
AI as predictive model for Neuro



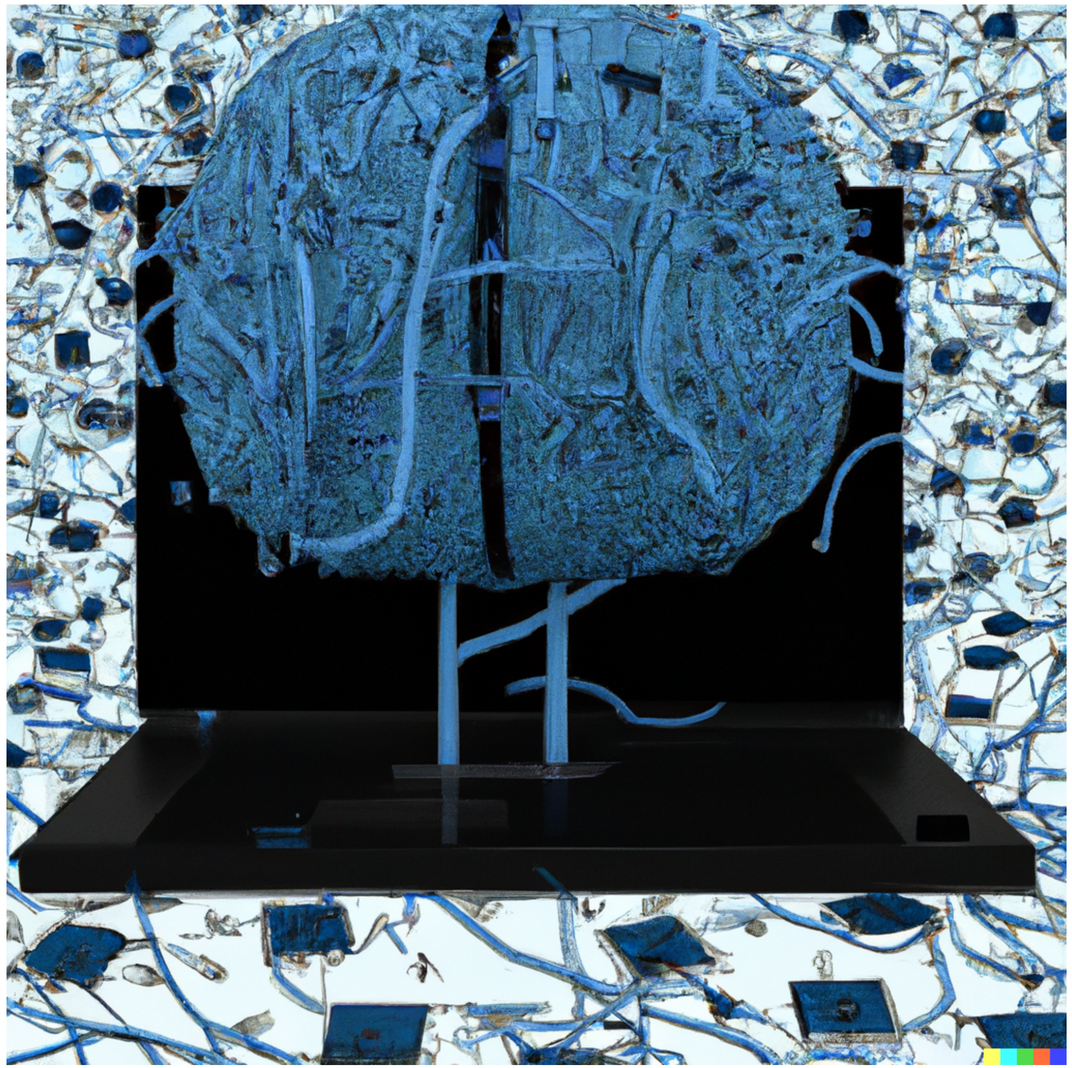
- Brain solves a problem
- AI solves similar problem using similar data
- AI may then be a good predictor of what happens in brain
- Think: Train on imageNet, predict V1, V4 etc (brainscore), Predict how brain may approximate backdrop, Attention is crucial in ANNs, how can it help similarly in brains, Bayes

Neuro as informing AI

- Brains are amazing. Low energy. Need little data. Very good generalization to new situations.
- AI systems are worse at these things.
- So let us look at neuro for inspiration
- Think: spiking neurons, neuro inspired hardware, liquid state machines, mainstream ANNs, learning hardware



The fields are really mis-aligned



What we need from AI

- Work out not one algorithm that works but a class of them
- Questions that can be answered
- E.g. which cost functions matter for x



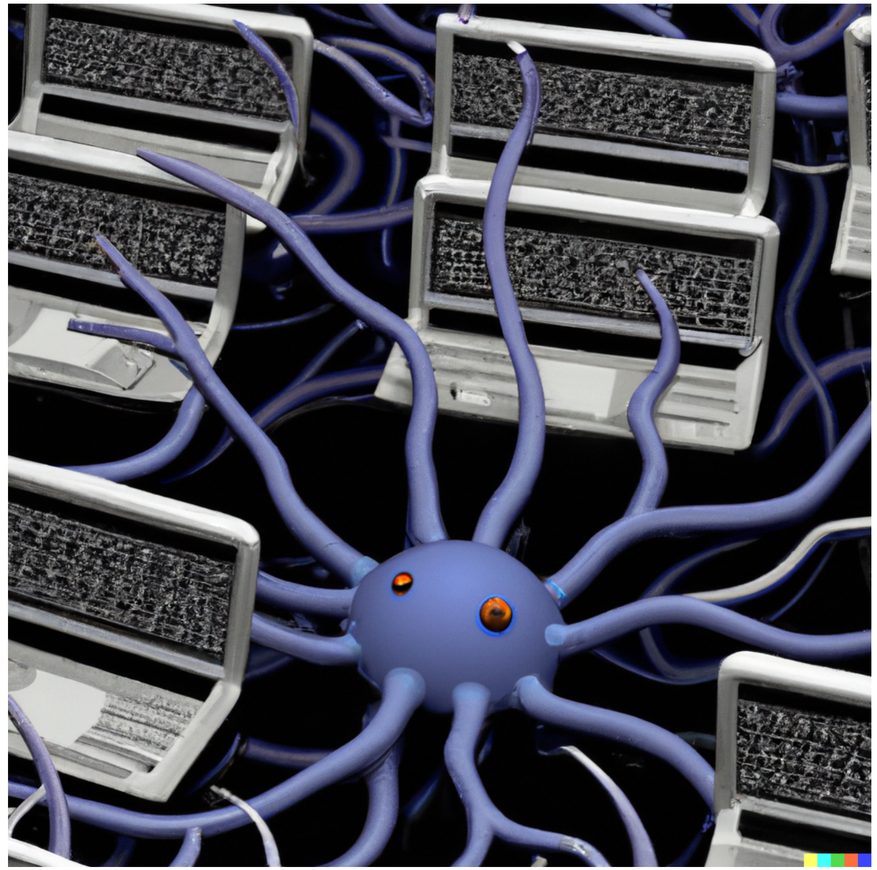
What we need from Neuro

- Test computationally interesting questions
- E.g. Those questions that relate to cost functions, architectures, optimizers



What we need from comp neuro

- Being a faithful glue between AI and Neuro
- Simple models are unlikely to be all that useful
- We need new bridges



Take home message

- NeuroAI is an interesting interplay between AI and Neuro
    - We really need the fields to each take the other field more seriously
- So happy you run a meeting on NeuroAI

