

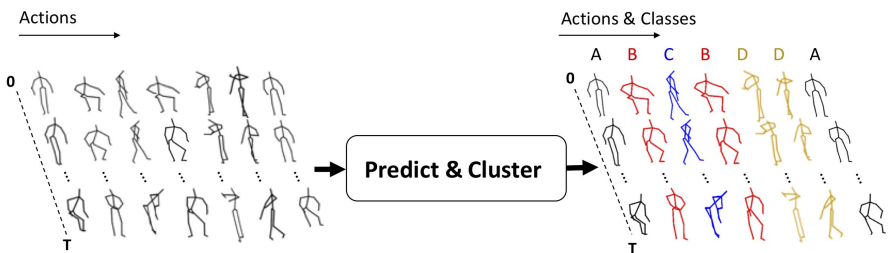
Neuroscience in A3D3: Summary and Discussion

Amy L. Orsborn, Eli Shlizerman, and Maria Dadarlat

A3D3 kickoff meeting
November 10th, 2021

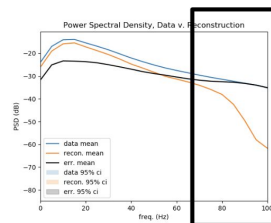
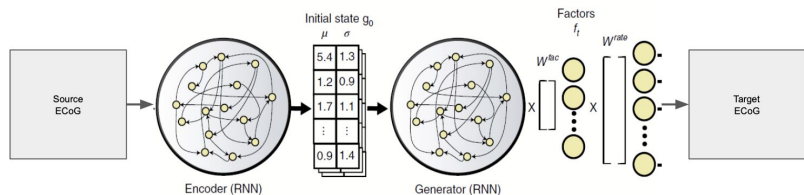
AI for identifying structure in neural data

Behavioral Data: Unsupervised Human Action Recognition (*Predict and Cluster*)

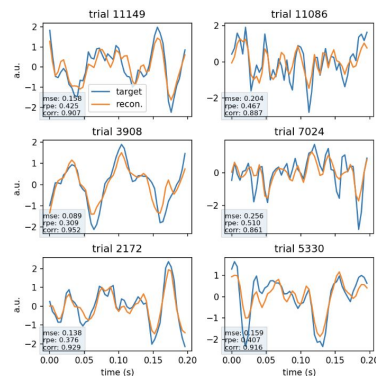


Su et al. CVPR, 2020, Su & Shlizerman, Front. AI 2020

Neural Data: Spike train data or Electrocorticogram (ECoG)



In progress to improve



Mike Nolan, Eli Shlizerman, Amy Orsborn

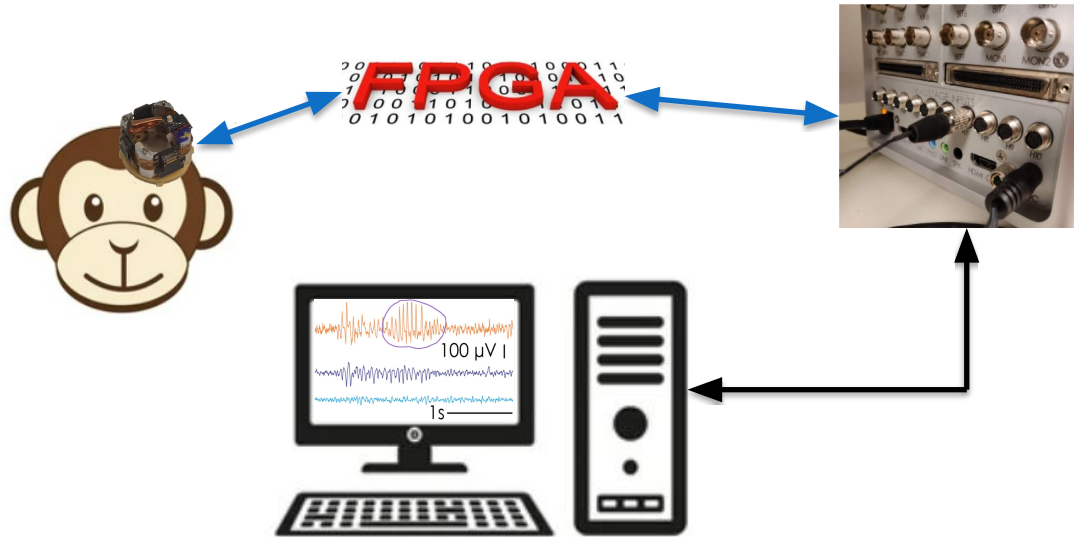
AI for real-time causal manipulations

Example applications:

Detect brain state (spindles), stimulate in real-time to disrupt

- Insights into brain state's impact on brain function/behavior

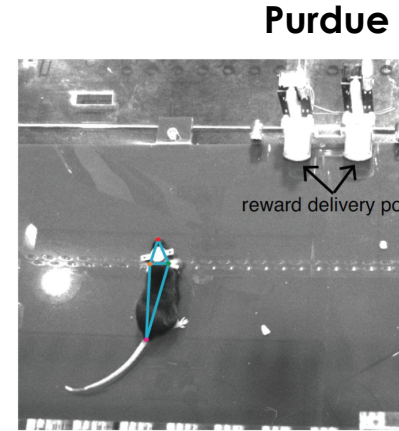
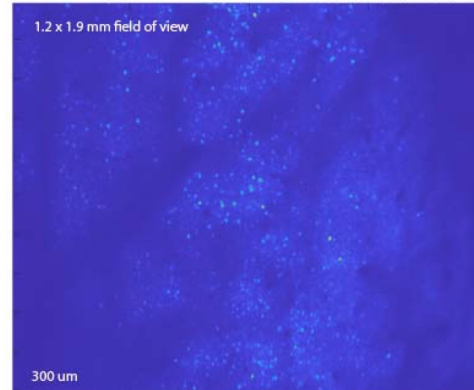
UW



Discussion/development: cloud-based very large-scale analysis pipelines

Large-scale brain recording + behavioral monitoring

- Identify
brain-behavior
relationships, structure
unsupervised



Opportunities to use and refine predict & cluster approaches for behavior

Advance approaches to link neural dynamics and behavior

Cloud-based implementation could be highly valuable

Discussion points: connections with targeted & heterogeneous systems & HAC

Pipelines for data cleaning of high value in neuroscience

Methods for online processing and learning also useful

Potential connections with ongoing work in Gravitational Waves in MMA ?

Potential connections with encoder-decoder data learning and graph representation in HAC?

Logistics and engagement

fastML slack channel for neuro (a3d3-neuro)

Will encourage trainees to join the slack and google groups for communication

Will leverage ongoing neuro-AI seminar from Shlizerman group for increased interactions

Other synergistic seminars for neuro teams to attend?