# An Al for Deciphering What Animals Do All Day

---- And More

#### Intro

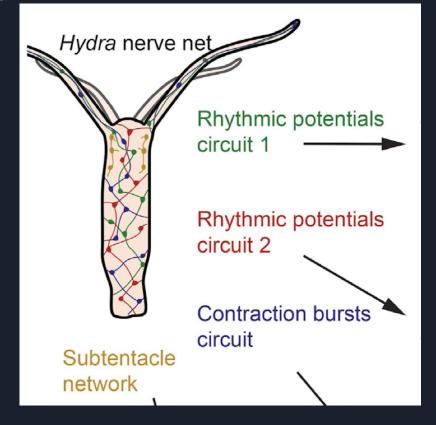
- Researchers at Columbia University studied the Cnidarian, Hydra, to better understand the organization of nervous systems in animals.
- They used a machine learning algorithm, which is a more elaborate version of the bag of words algorithm commonly employed to classify spams, to completely categorize the Hydra's motion.

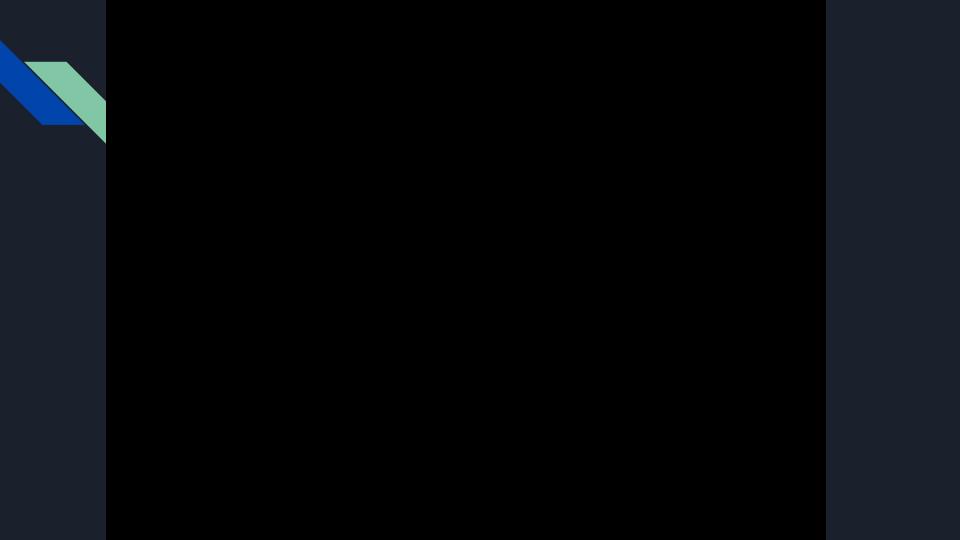
### What is Hydra?

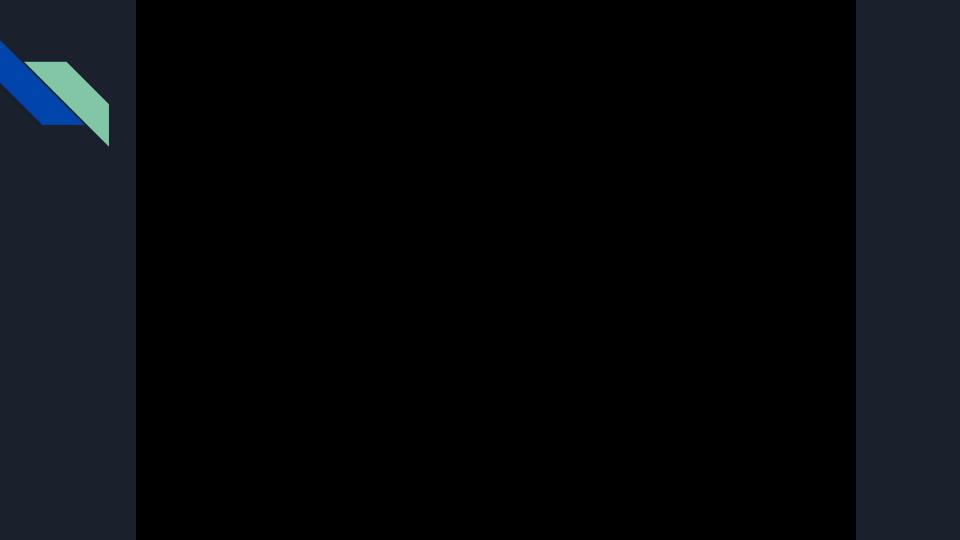


#### What is Hydra? (cont.)

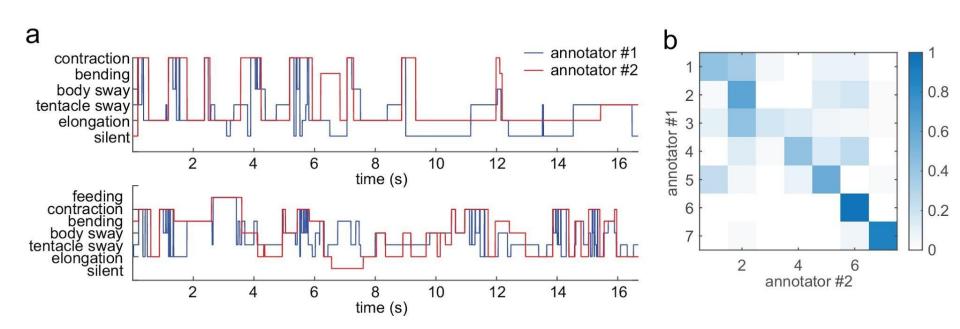
- Model organism for biology
  - Easy to keep alive in lab
  - 0.5 cm 1.5 cm long, fits into the field of view of a microscope
  - Non-overlapping neurons for easy imaging
  - Regenerates
- Previous finding: Hydra's nervous system consists of 4 disjoint neural networks, each responsible for specific motor function such as ingestion and bending.





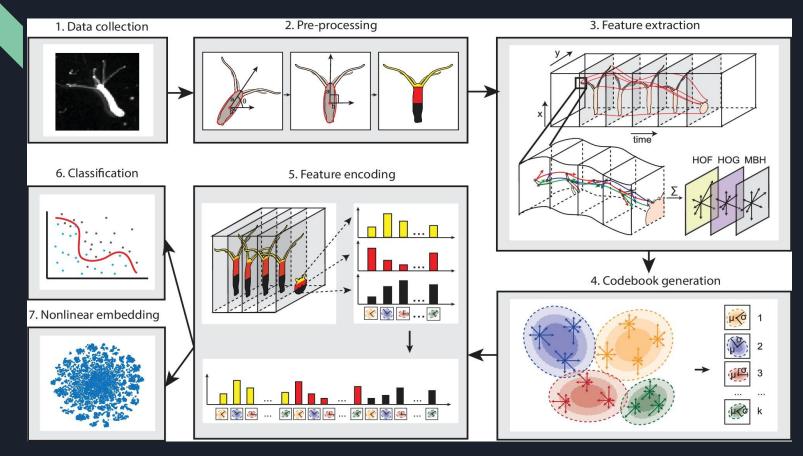


#### Manual Annotation - uh!



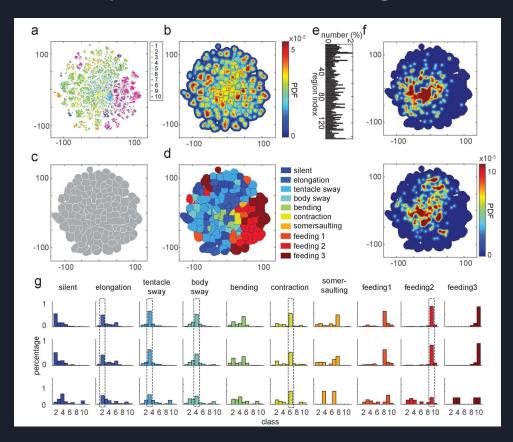


### Analysis Pipeline





### Unsupervised Learning



#### Findings

- Unsuperivsed learning of datasets collected over 3 days reveals more subtypes of previously identified behavior, as well as a new behavior: egetion, which due to its short timescale, eluded human observers.
- Hydra's behavoir does not change because of enviornmental variables such as light/dark, availability of food, and temparature.

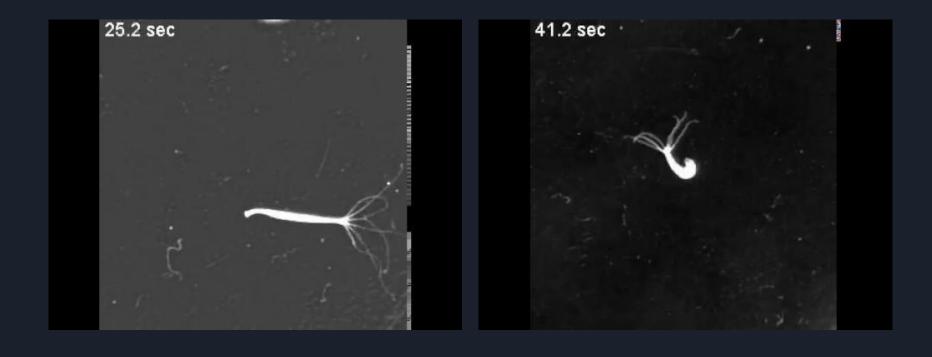
#### Applications

- Studying Hydra paves the way for studying the nervous systems of more complex organisms.
- Researchers are impressed with the contancy of Hydra's behavior and think that the underlying mechanism can have an application in robotics and engineering.

# Questions?



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