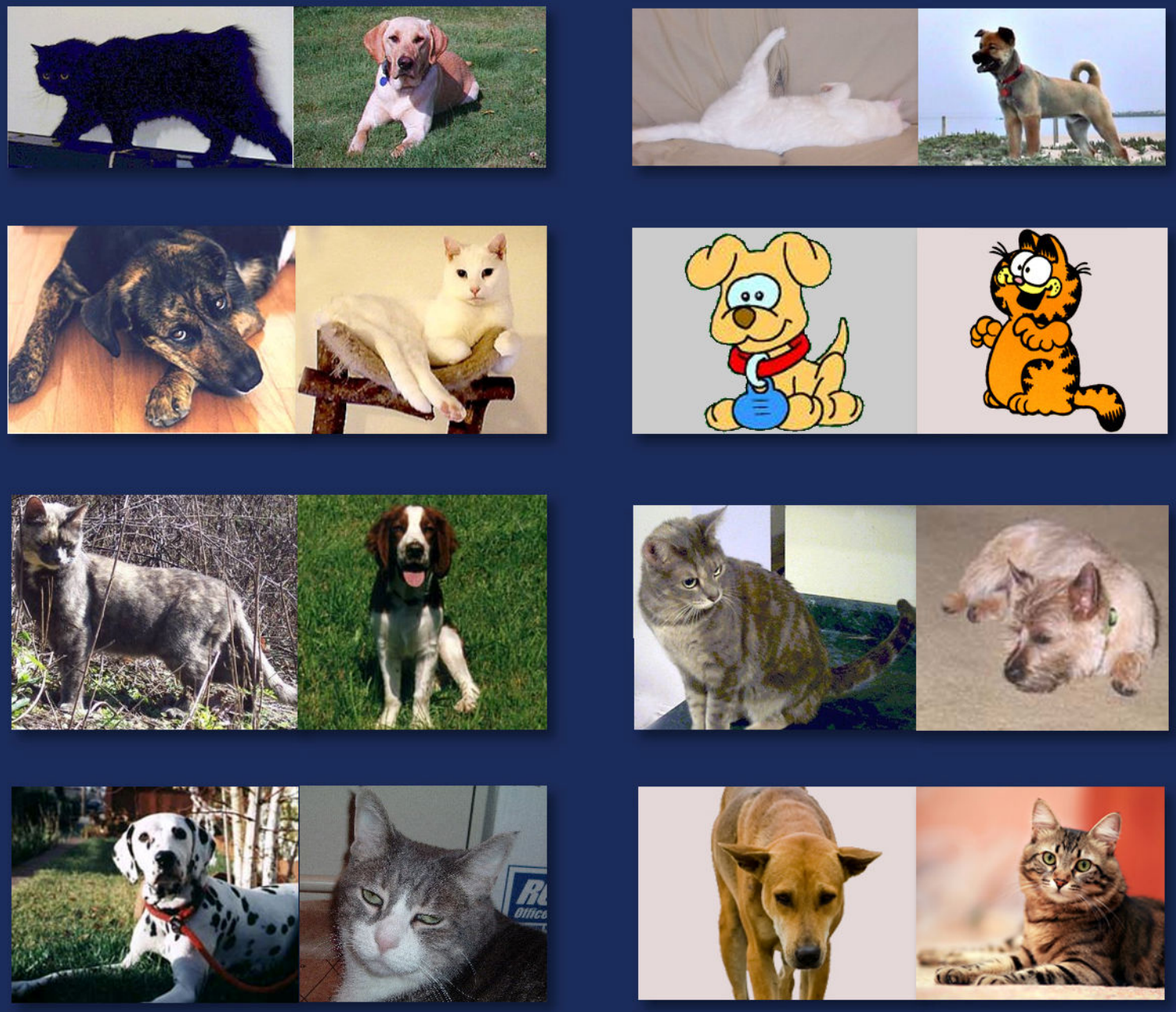
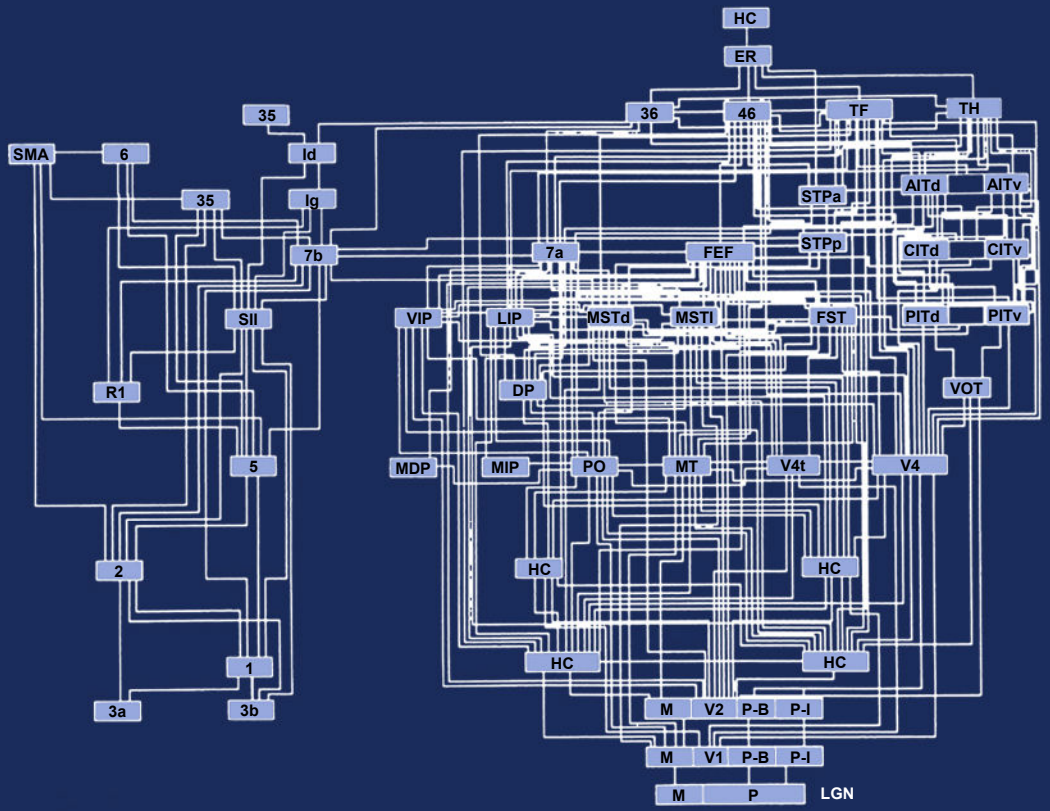
Mary saw the puppy in the window.
She wanted it.

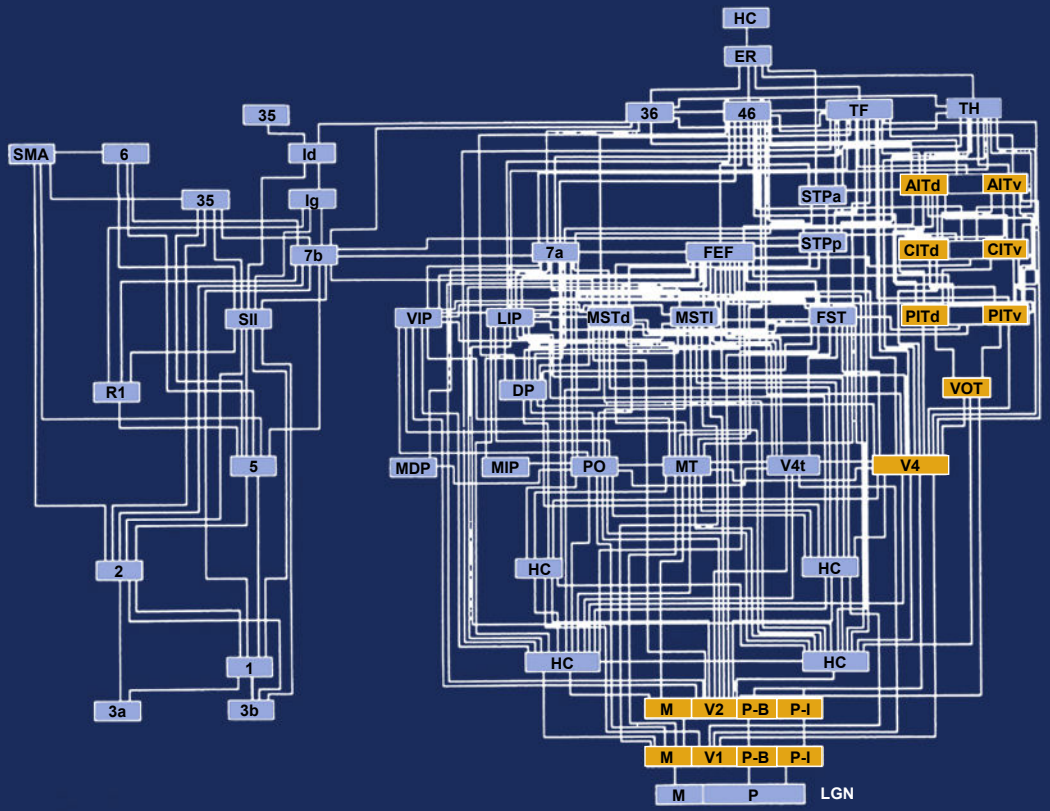




Sensory data (skin)

Sensory data (retina)

- Knowledge is distributed hierarchically
- Self training through changing sensory patterns
- Each region is similar



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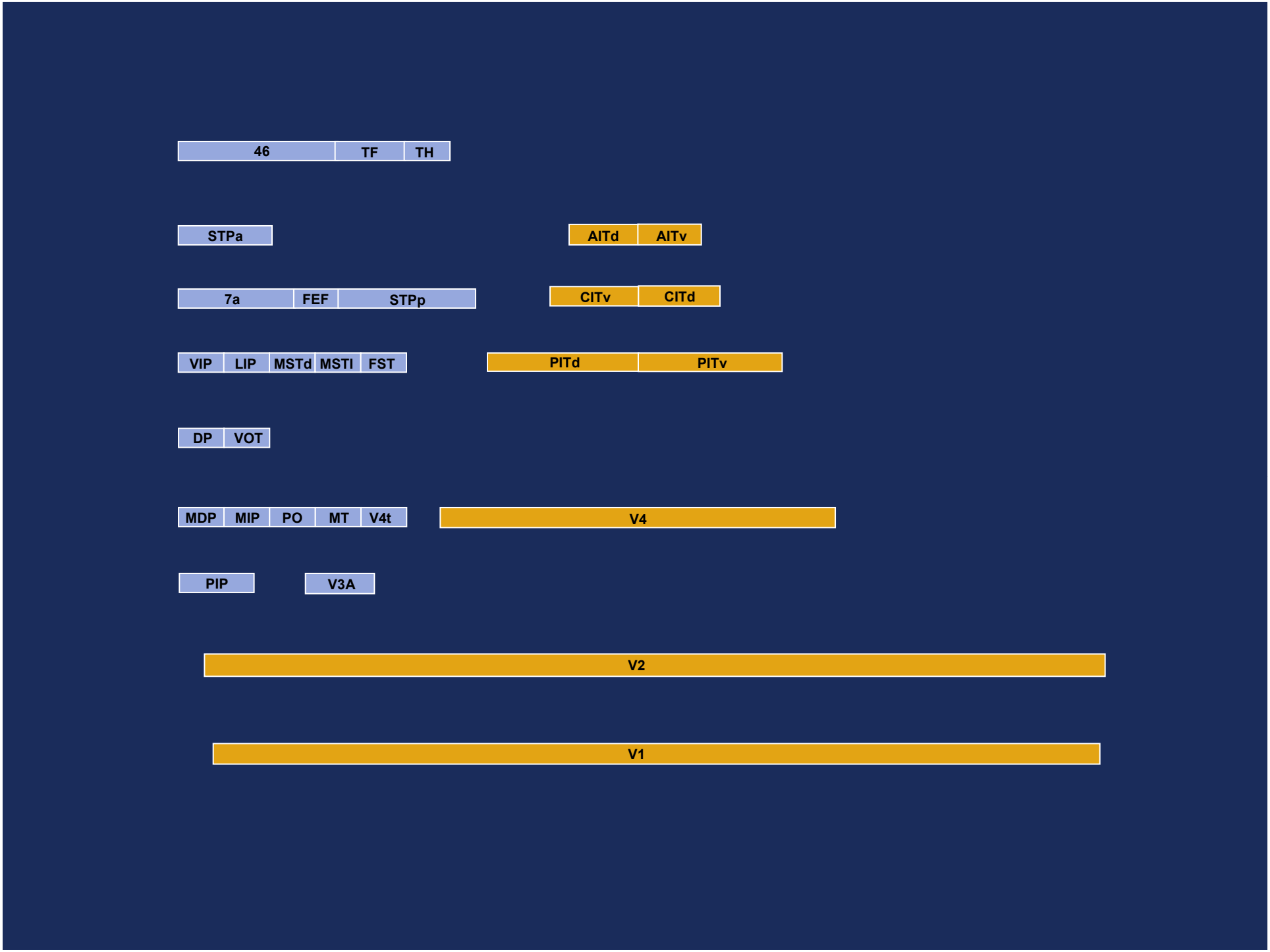
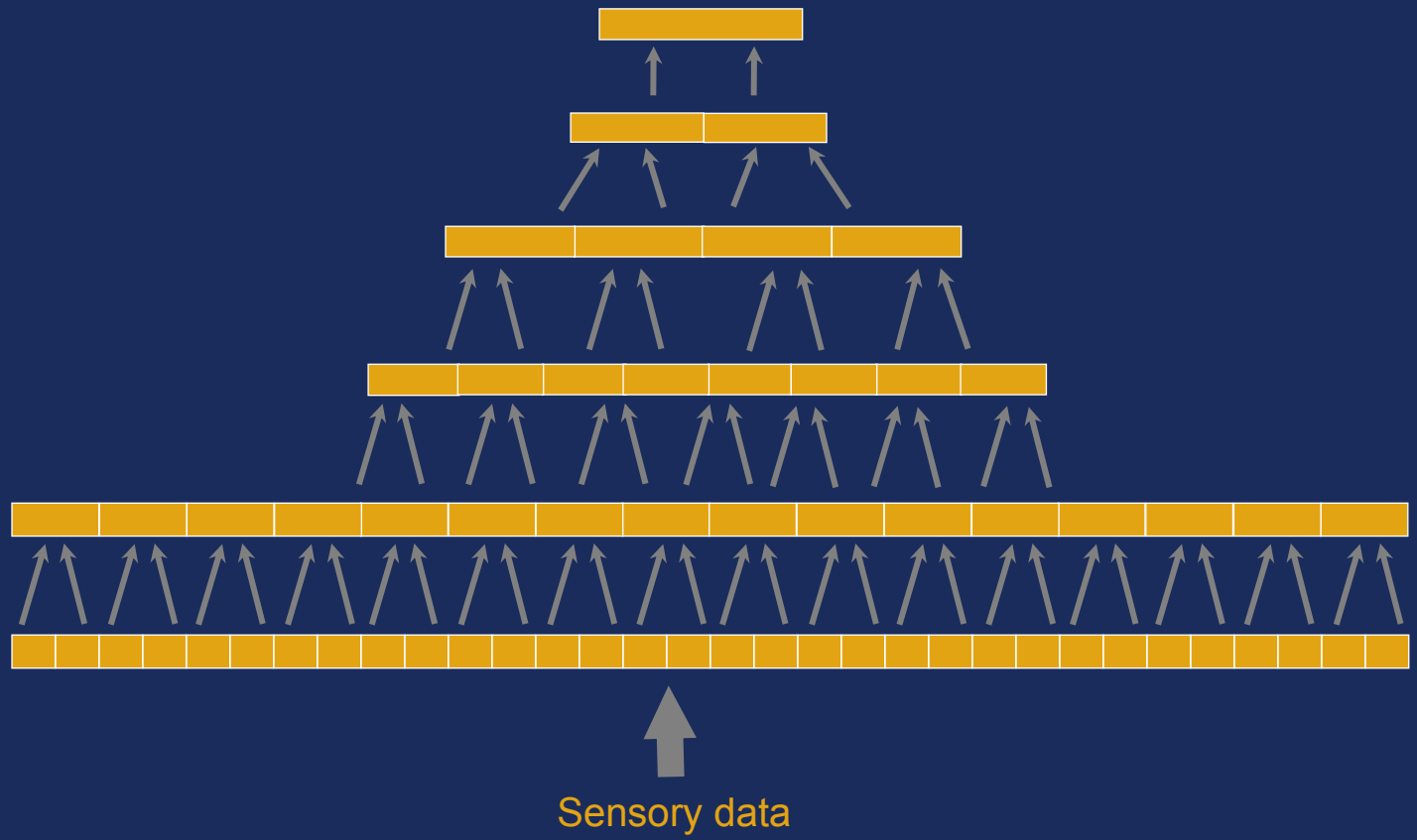
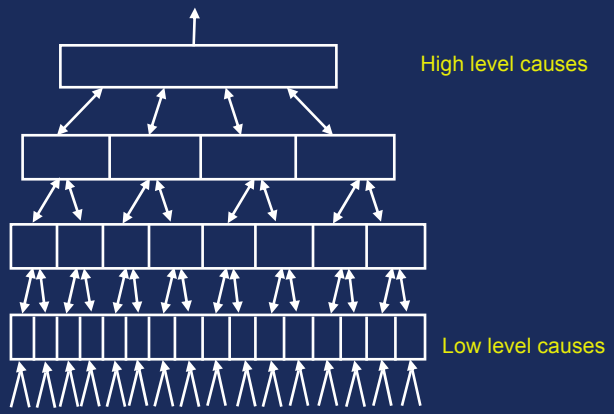




Hierarchical Temporal Memory



All nodes do same thing

- Learn common spatial patterns
- Learn common sequences

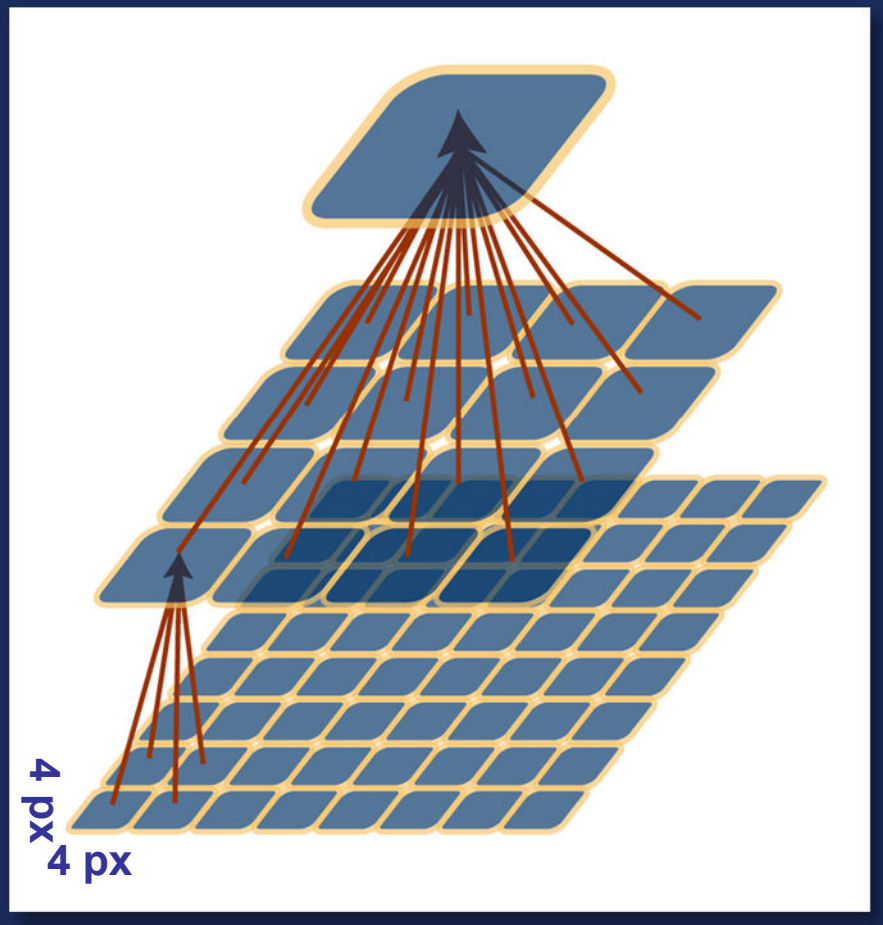
Sequence names passed up

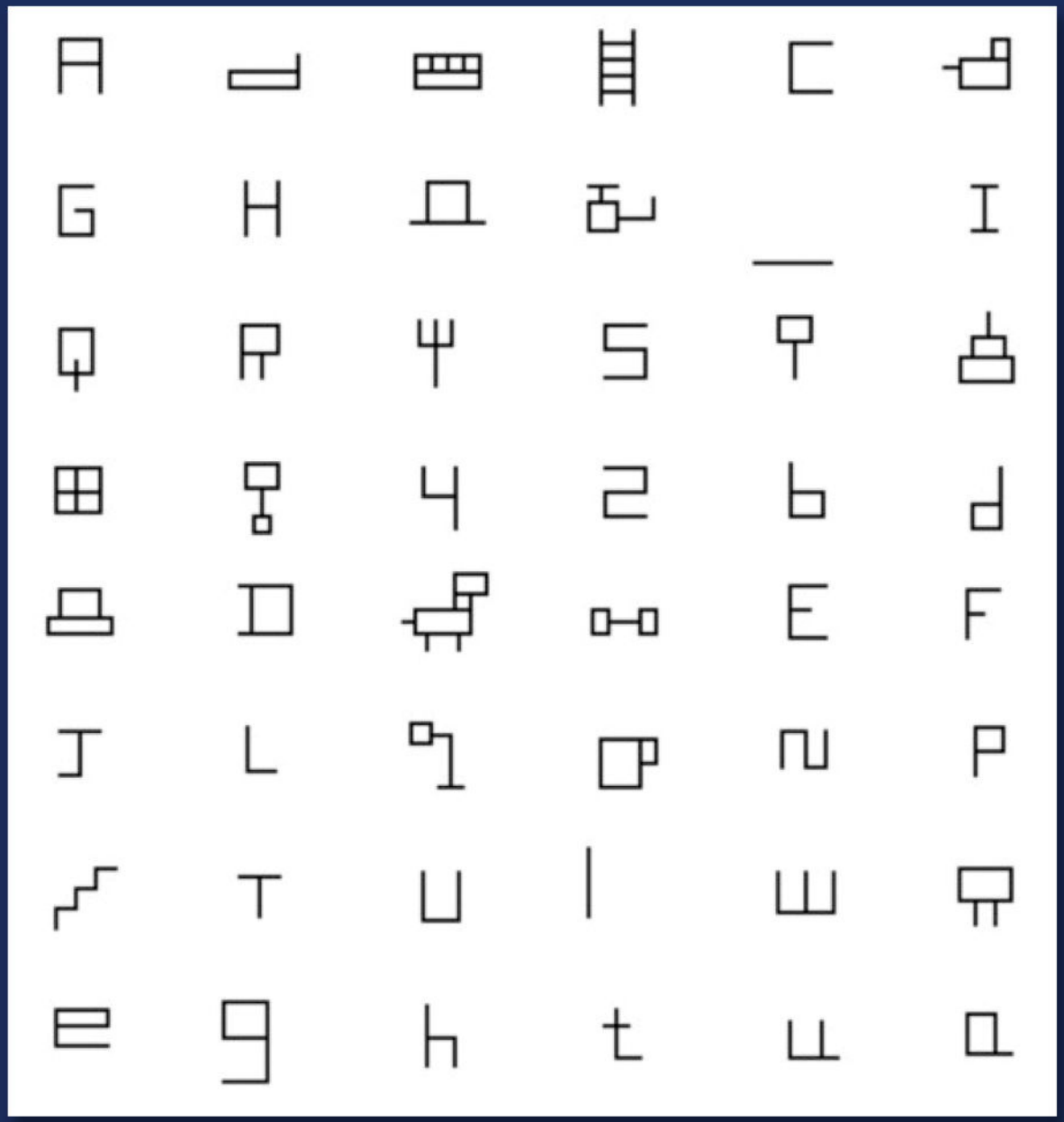
Predicted spatial patterns passed down

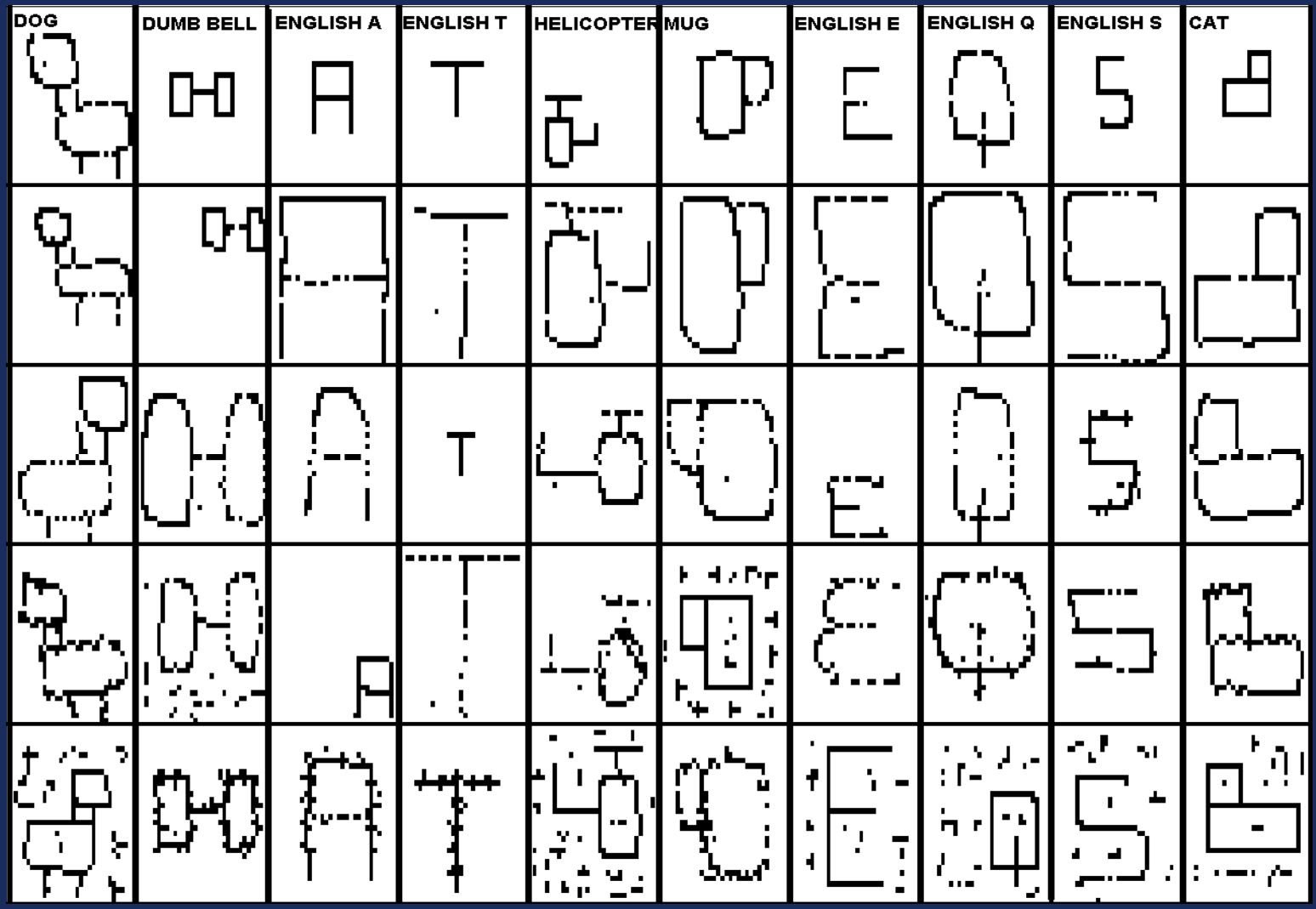
Creates hierarchical model of causes

Bayesian methods resolve ambiguity

Pictures: Simple Vision System (32 x 32 Pixels)







Time Based Inference

Time Based Inference

Static inference
(with noise)

19%

Time Based Inference

Static inference
(with noise)

19%

Time Based Inference

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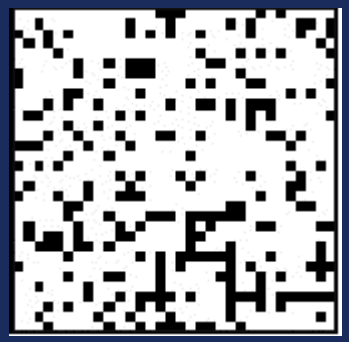
(with noise)



19%

Time Based Inference

Static inference
(with noise)

19%

Time based inference
(with noise)

52%

Time Based Inference

Static inference
(with noise)

19%

Time based inference
(with noise)

52%

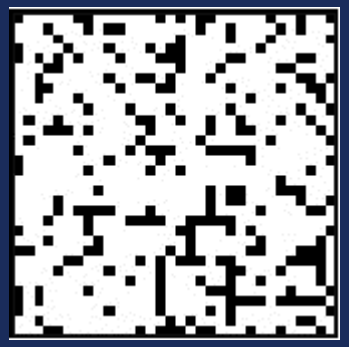
Time Based Inference

Static inference
(static noise)

19%

Time based inference
(with noise)

52%

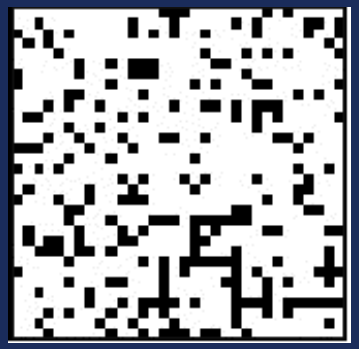


Time Based Inference

Static inference
(with noise)

19%

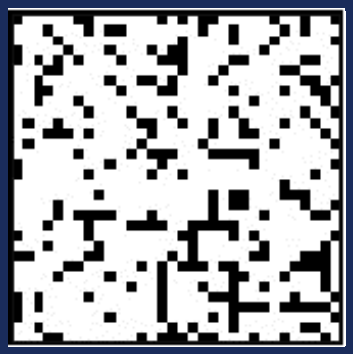
Time based inference
(with noise)



52%

Click in box on the left to play video

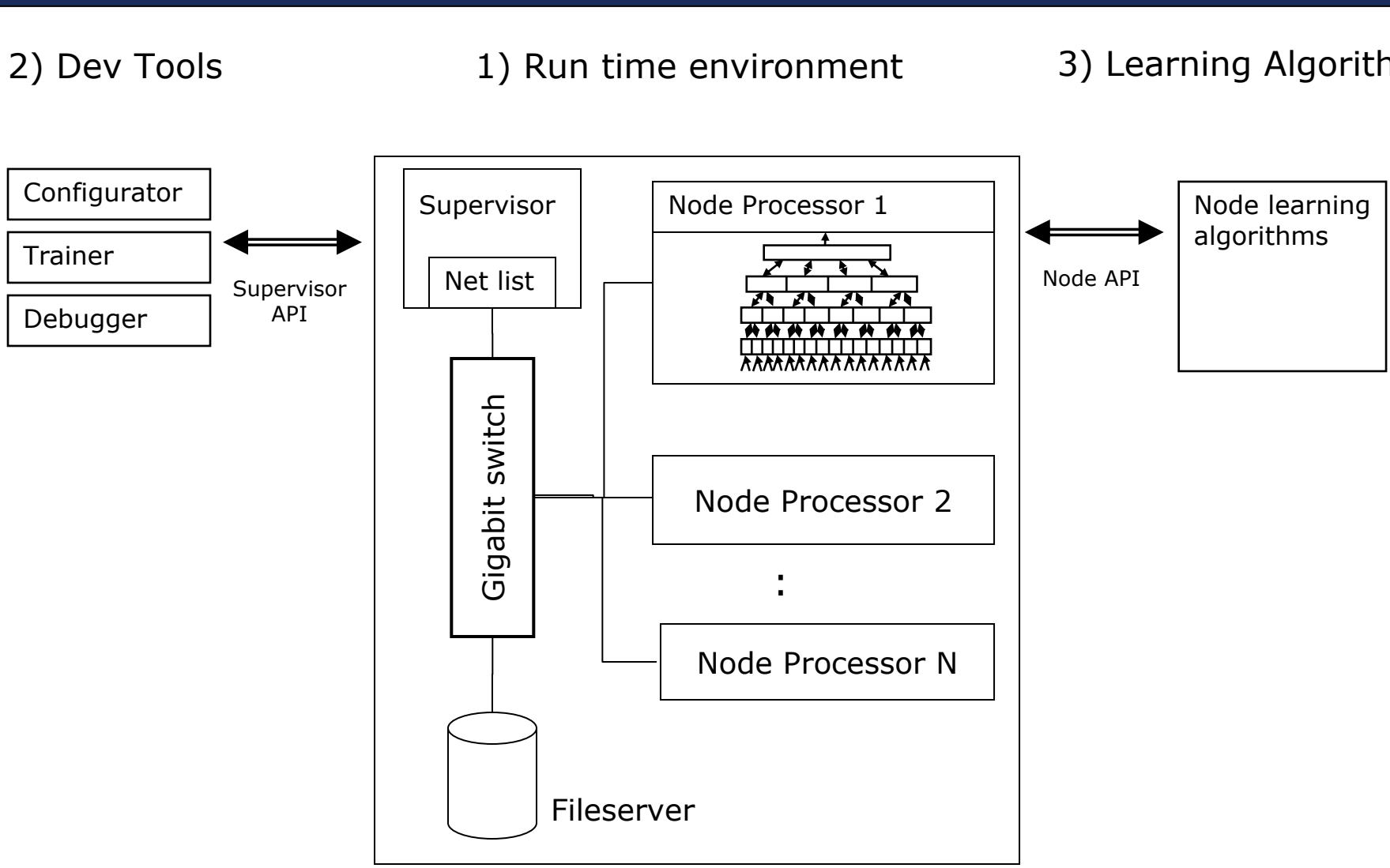
Time based inference
(with dynamic noise)



40%

Click in box on the left to play video

NuPIC, Numenta Platform for Intelligent Computing



HTM Applications Using NuPIC 07

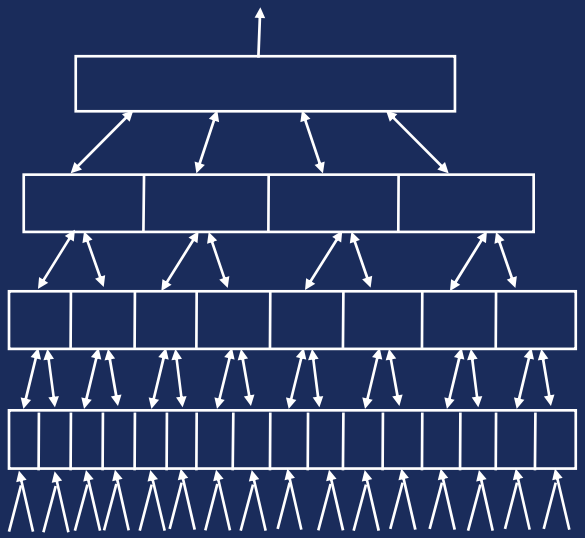
- 100-200 developers, 8 NPP partners
- Gaming: Motion capture inference
  Visual object editor
- Auto: Lane change prediction
- Voice: Speaker and gender identification
- Vision: Visual object recognition
- Process Control: Power network analysis

HTM Vision System Using NuPIC 08

- sample categories -

HTM Vision System
- novel recognized images -

Benefits of Hierarchical Memory



Sensory data

- Efficient (storage, training time)
- Self-learning
- Generalization

- Prediction / Behavior
- Matches hierarchical world

For additional multimedia material: See http://www.isscc.org