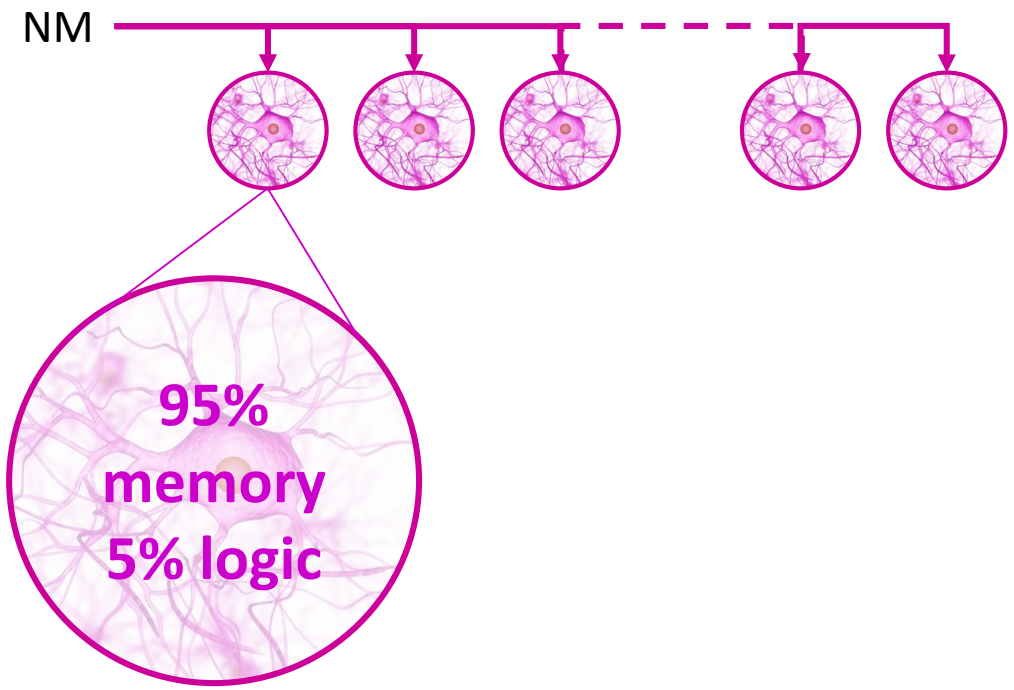
- Real-time Life long learning
- Always-On pattern recognition
  - Classification
  - Anomaly and Novelty detection
- Deterministic latency (µsecs)
- Low power (mWatts)
- Explainable AI

General Vision Inc.

3rd Wave of AI chips

NeuroMem Technology



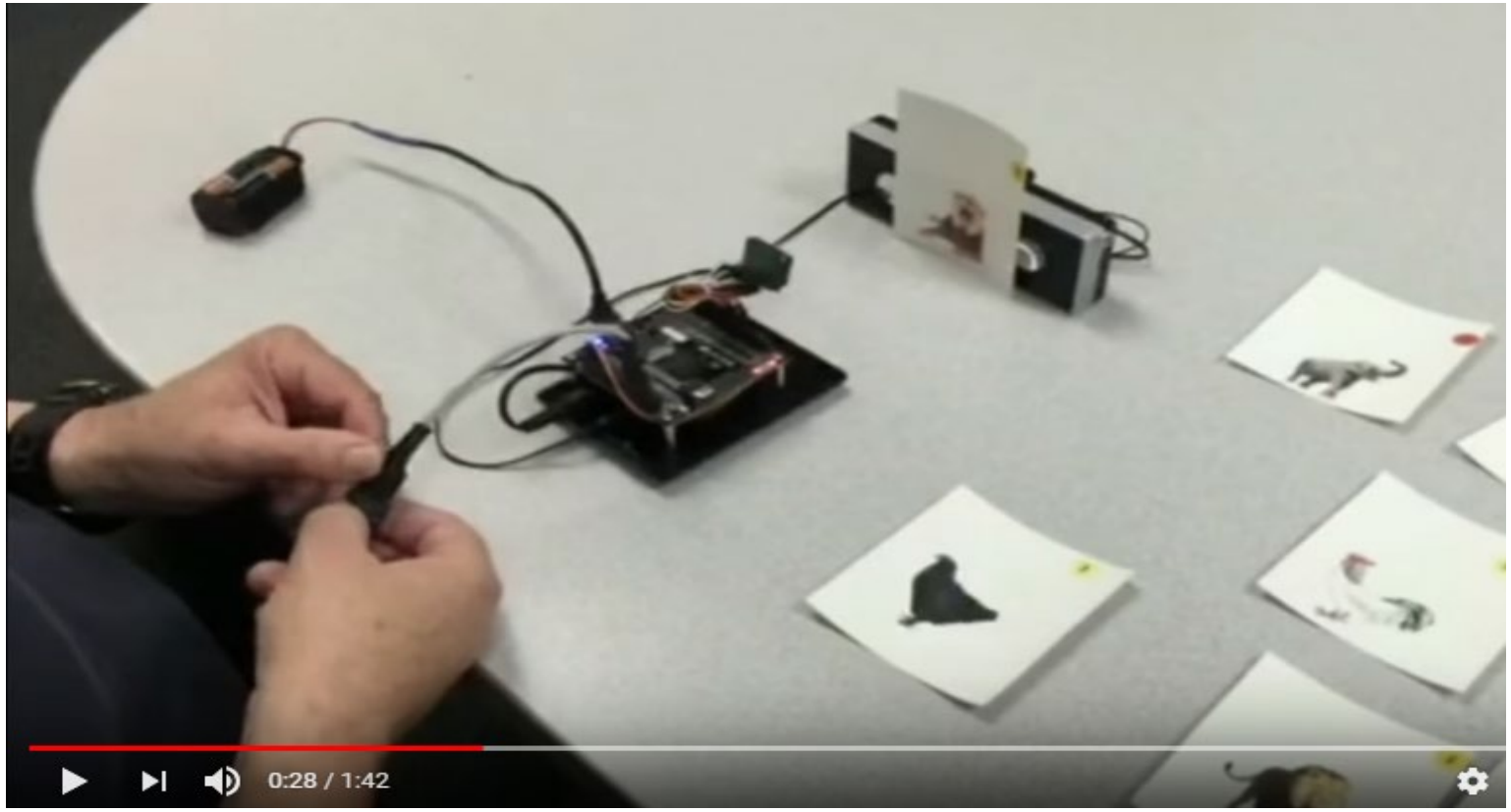
- Bank of identical neuromorphic memory cells
  - Working in parallel
  - Exact and fuzzy matching
  - Learn by examples
- Memory and processing in a same cell
- Deterministic latencies
- Low power
- Knowledge Traceability

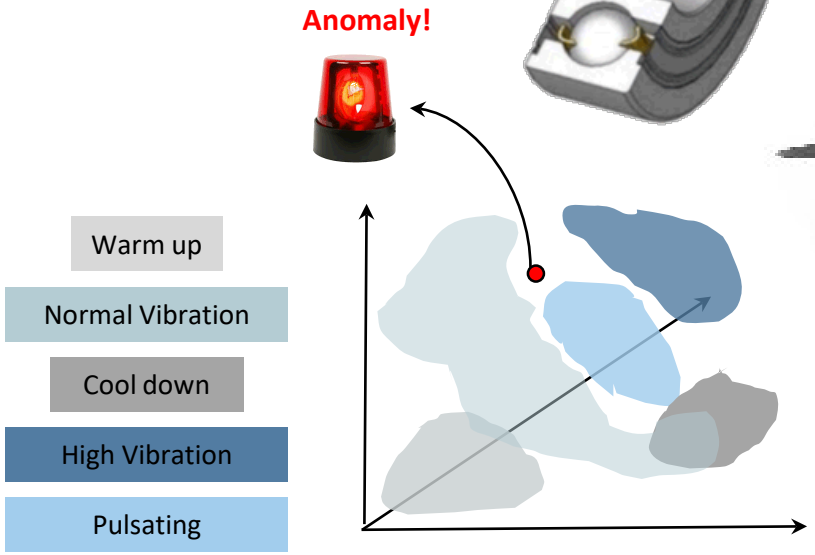
2003, Pulnix ZiCAM
(312 neurons)

- 50 systems, in continuous operation, saving US$2M per boat,
- Trained in deep sea waters by Nordic fishermen
- No cloud access

Technology in high demand	Numerous applications	Across many industries
Machine learning	Video & Image analytics	Aerospace
Edge Intelligence	Signal and audio analytics	Automotive
Data Analytics	Scientific analytics	Consumer electronics
Predictive maintenance	Text & packet analytics	Environment
Failure analysis		Healthcare
Novelty detection		Industrial
		Other

Battery operated Image to Speech demo, real-time learning of flash cards, no software

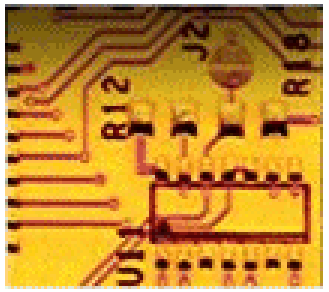




- Stimuli
  - Voltage, Torque, Sound, Vibration
  - Angle, velocity
  - Temperature (human, ambient)
  - Biosensors
- Learning
  - Supervised learning of normal operations
  - Unsupervised learning of novelties
- Recognition
  - Sensors to transmit only information of interest: Events, drifts, novelties
  - Adaptive control

Signal Monitoring & Predictive Maintenance

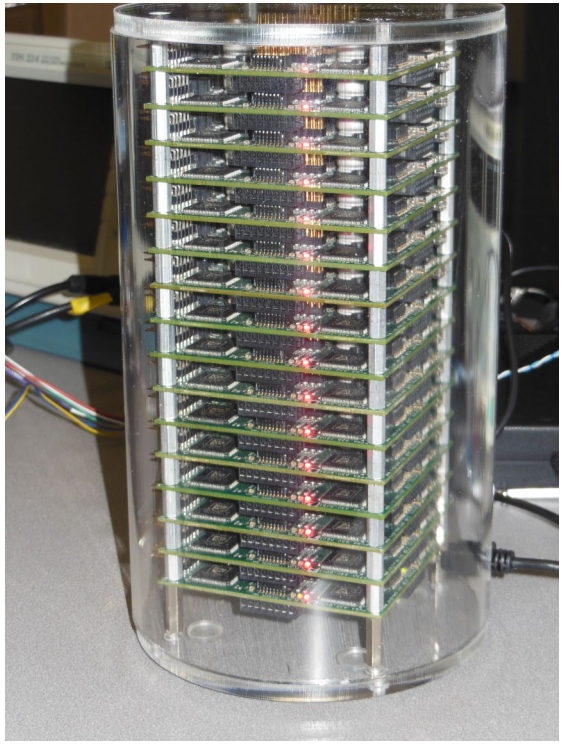
Trainable photocells & industrial cameras



Industrial and professional vision systems

Embedded and low-power systems

- Stimuli
  - Live video
  - Images, movie files
  - Combined with audio, GPS, etc.
- Learning
  - Discrete objects
  - Colors, shapes, alignments
  - Textures and surfaces
- Recognition
  - Identification
  - Classification
  - Defect or novelty detection
  - Disparity localization

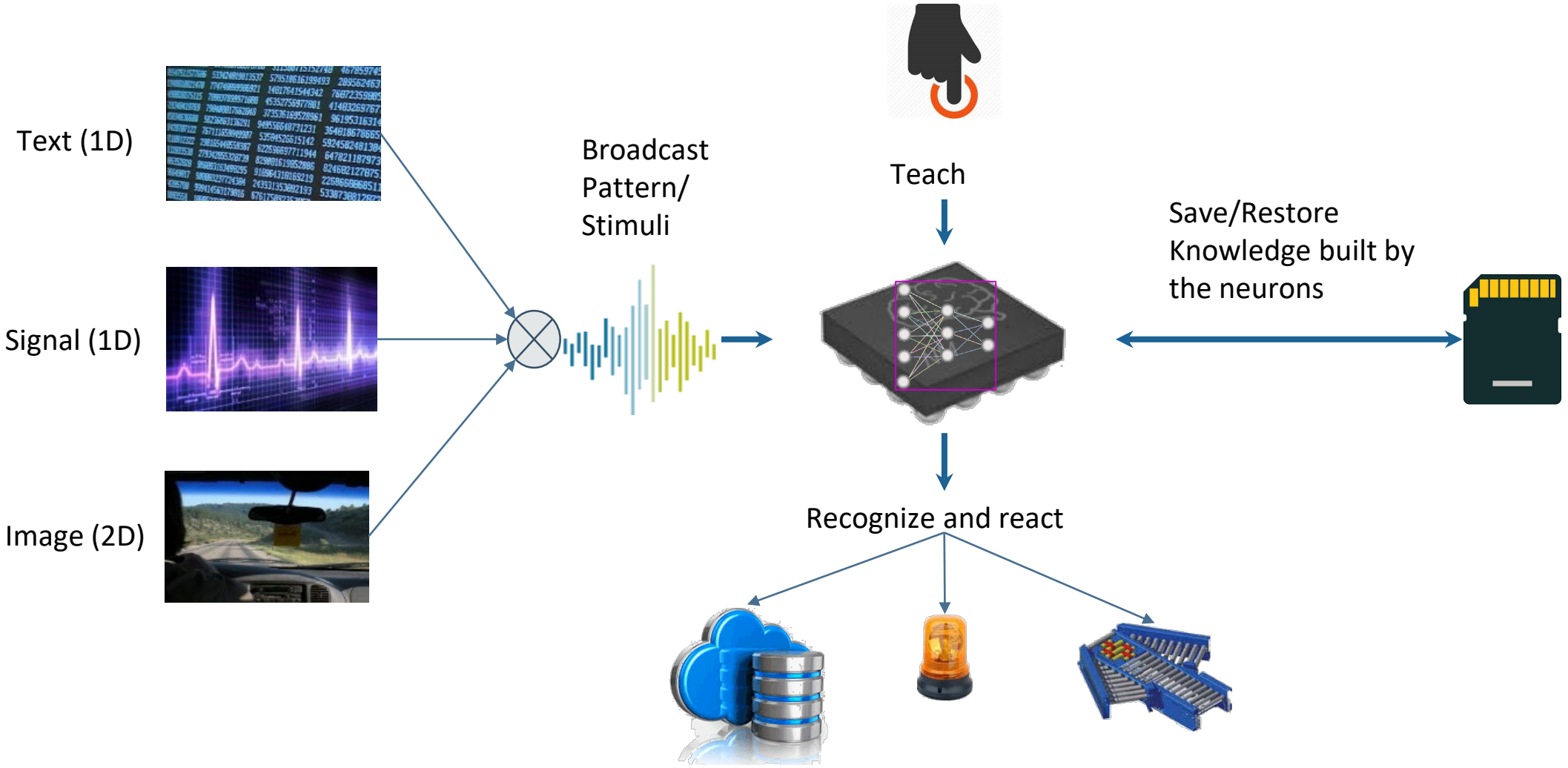


NeuroTube, 65536 neurons

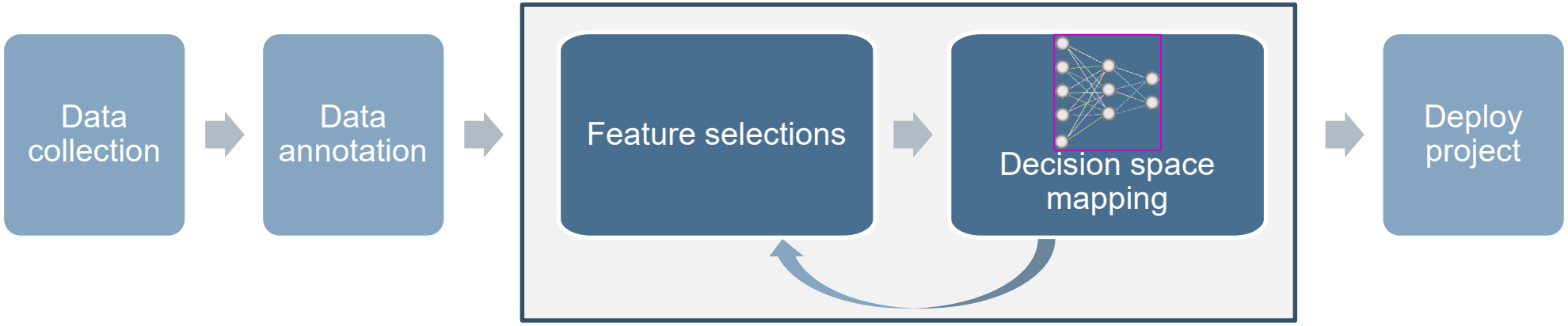
40,000 pattern/second
= 2,684,354,560,000 ops/sec
= 2.68 Teraoperations/sec @ 12 Watts
= 223 Gigaoperations/sec/watt

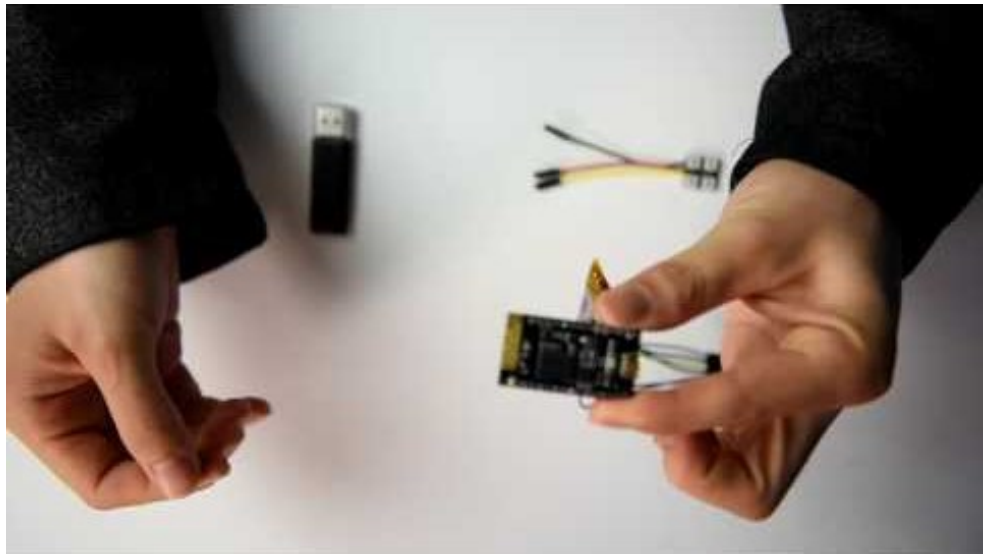
Power efficiency @ 10 MHz:
12 Watts
(24 volts/0.5 Amp)
386 Mips per milliwatt

- Stimuli
  - Tweets
  - Documents
  - Computer logs, financial logs
  - Packet uplinks
- Learning
  - Dictionaries of words and expressions
  - Random encrypted lookups
- Recognition
  - Word spotting and counting
  - Exact matching
  - Clustering
  - Drift and anomaly detections
  - Trending and prediction

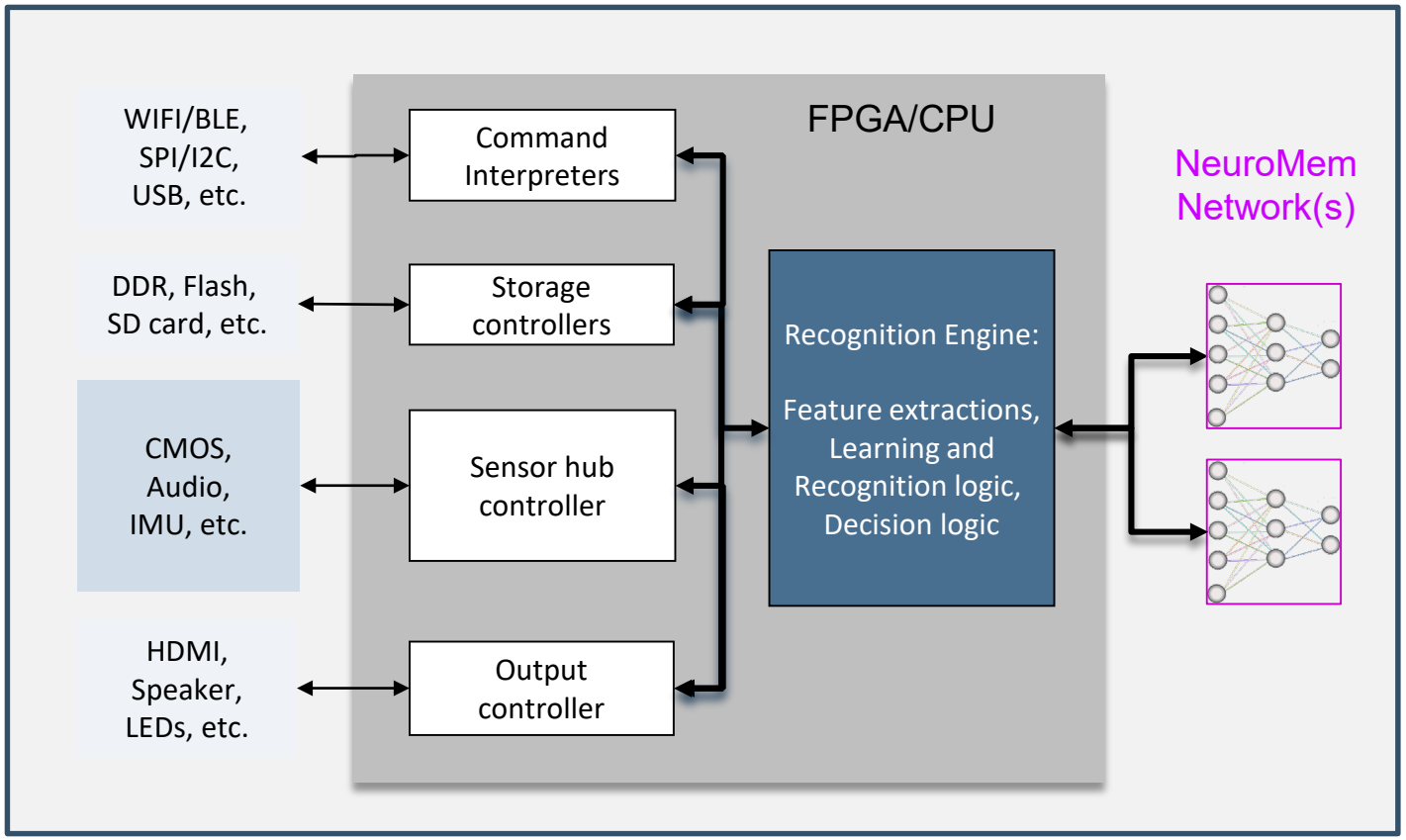

Text (1D)
Signal (1D)
Image (2D)
Broadcast
Pattern/
Stimuli
Teach
Save/Restore
Knowledge built by
the neurons
Recognize and react

Knowledge Builder Tools





A simple common platform



Proliferation of NeuroMem_Smart sensors

with autonomous actuation and selective transmission and storage

Commoditization of NeuroMem_Smart secure IT

NeuroMem_Smart servers and data centers with distributed low-power search engines