HAMUX lets anyone easily build & train HAMs at scale

HAM:
- ✔ Any #layers
- ✔ Any differentiable ops
- ✔ Many-body synapses

Hopfield Net:
- 2 layers
- Linear operations
- Pairwise connections

\[ E = (x \cdot g) - \mathcal{L} \]

\[ \mathbf{F} \]

Hidden states: recurrently descend the tractable energy to a fixed point

\[ E_{\text{HAM}} = \sum_{\text{layer}} E + \sum_{\text{synapse}} E \]

```
def classify(ham, IMAGE, DEPTH, STEP_SIZE):
    xs = ham.init_states()
    xs[0] = IMAGE
    for i in range(DEPTH):
        dEdgs = ham.dEdg(xs)
        xs = [(x - STEP_SIZE*dEdg) for (x, dEdg) in zip(xs, dEdgs)]
    return xs[2] # LABEL
```