

clarifai



clarifai

Advanced Image Recognition

Recognize tens of thousands of categories, objects, and tags in any image.

[Try our live demo »](#)

Stay in the loop with news about Clarifai.



Your email address

I'm mainly interested in...

I'd like beta API access.

[Keep me updated](#)

Take our demo for a spin.

Send us an image, and we'll understand it using our model trained on 10,000 categories.

Upload an image

[Choose image](#)

By uploading an image, you agree to our [terms of use](#).

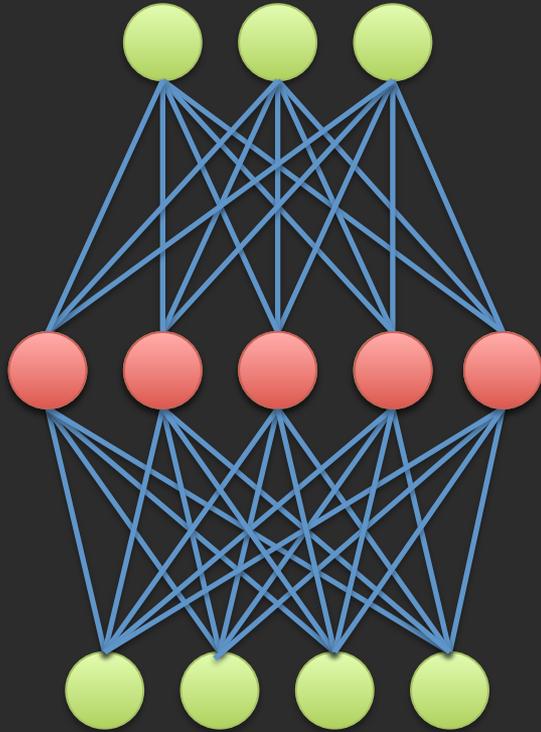
Or...

Enter an image URL

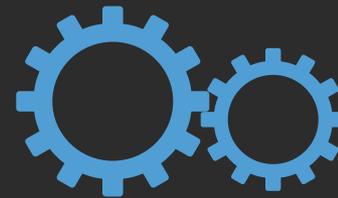
Image URL

[Go](#)

How does it work?



Yacht



Convolutional Networks

- Supervised & feed-forward
- Each layer:
 - Convolve input with filters
 - Non-linearity (rectified linear)
 - Pooling (local max)
- Train convolutional filters by back-propagating classification error

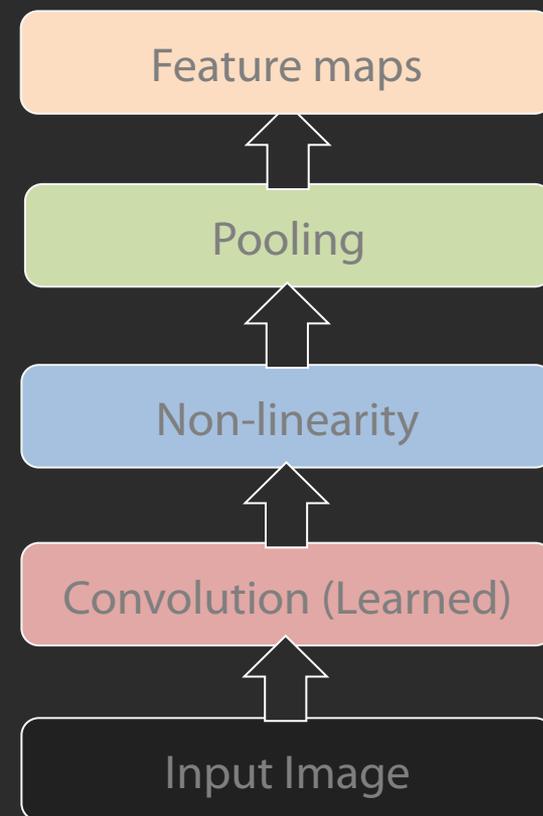
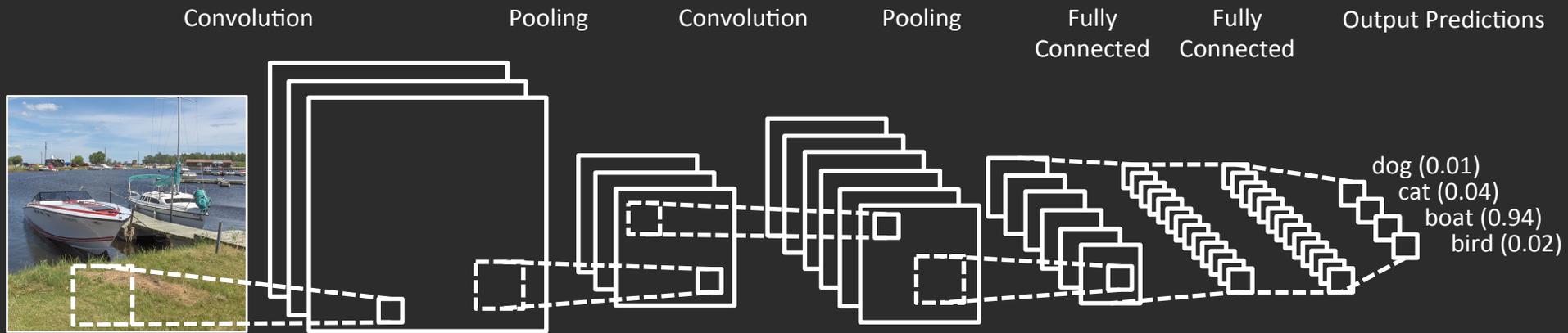


Image Recognition



Neural Network History

1980s



Geoff
Hinton

Google



Yann
LeCun



2009



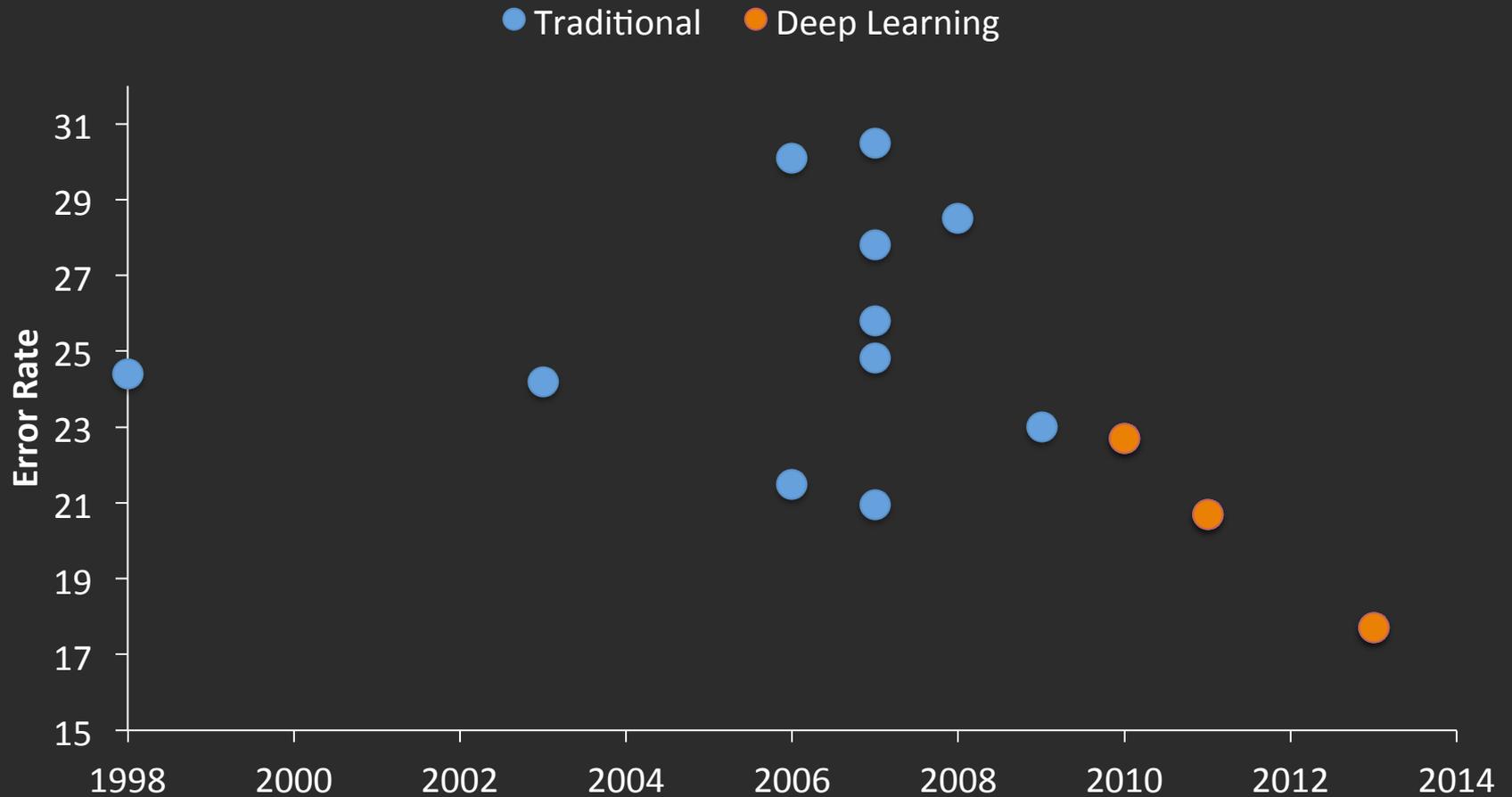
30x Speedup

- more data
- bigger models
- faster iterations

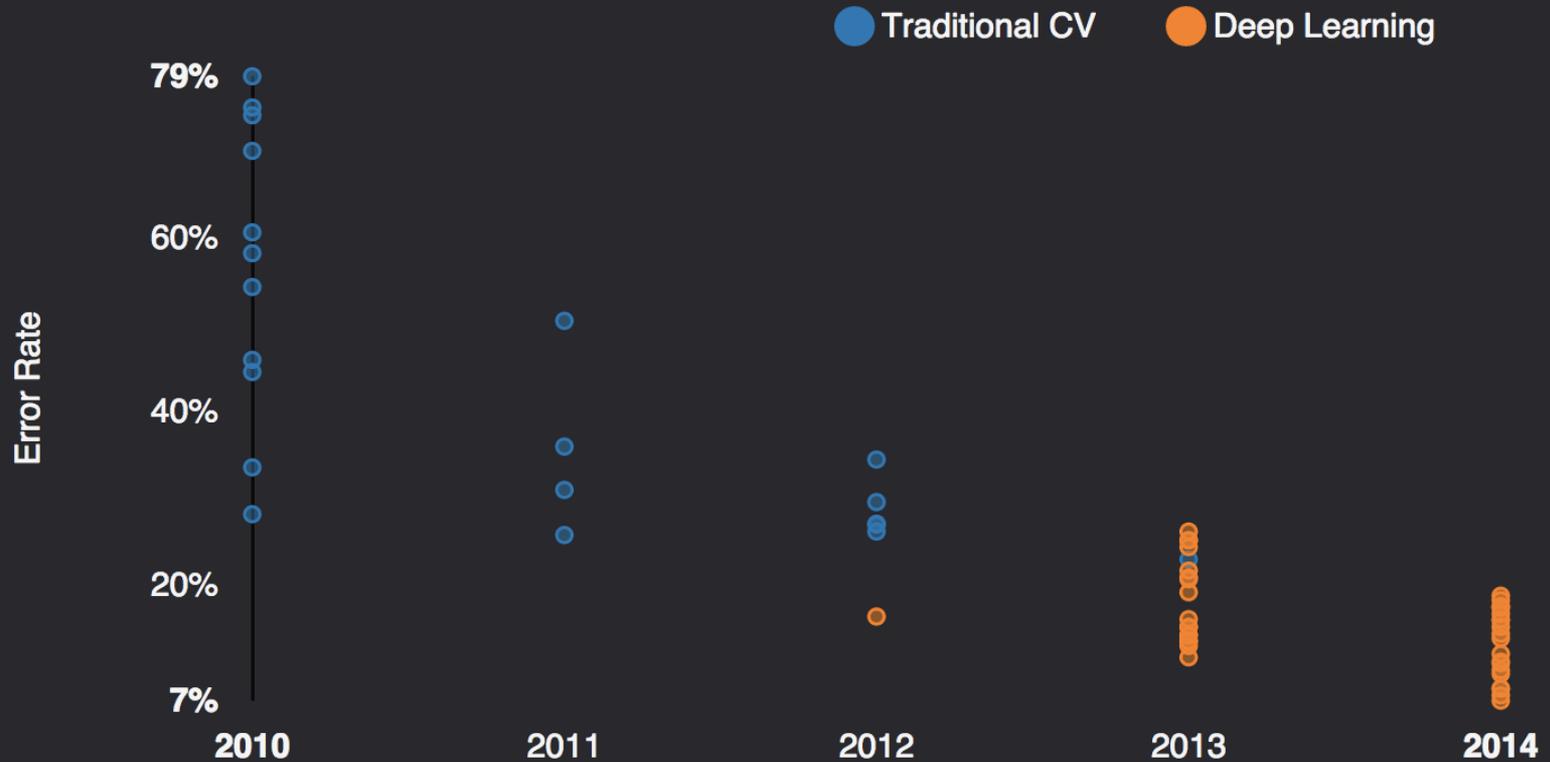
Deep Learning Breakthroughs

- Speech Recognition
- Image Recognition
- Natural Language Processing
- Medical Drug Discovery
- Character Recognition
- Satellite Image Alignment
- ...
- Anything with data!

TIMIT Speech Recognition



ImageNet Error Rate 2010-2014



Recent Success

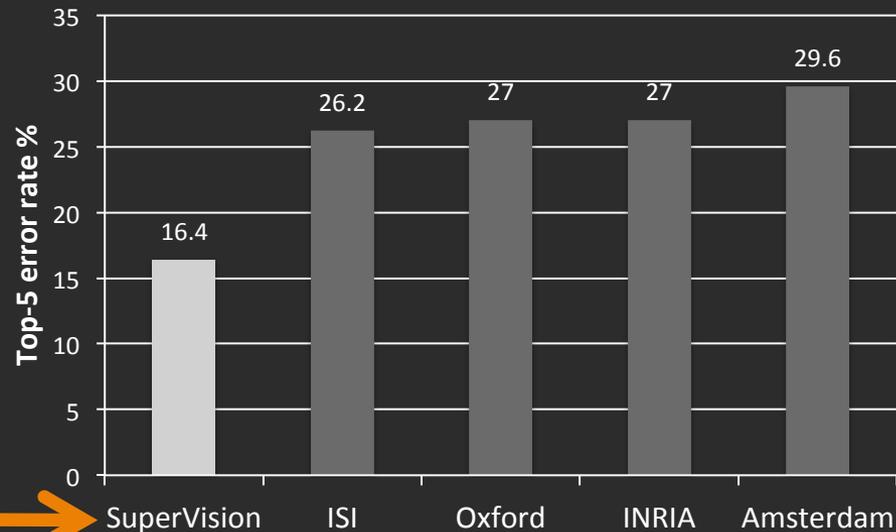
ImageNet Classification with Deep Convolutional Neural Networks

Alex Krizhevsky
University of Toronto

Ilya Sutskever
University of Toronto

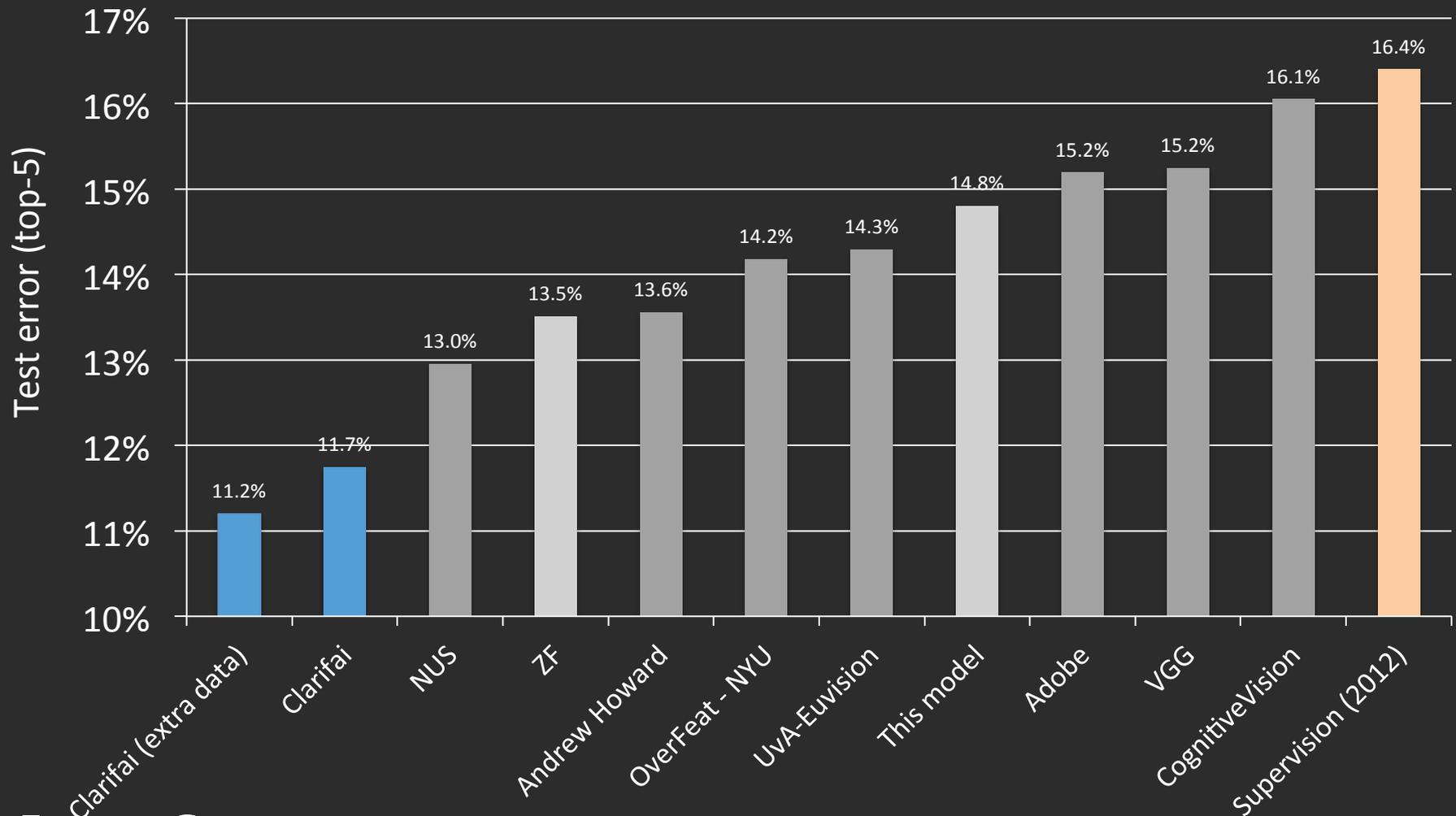
Geoffrey E. Hinton
University of Toronto

ImageNet 2012
classification
competition results



ImageNet Classification 2013 Results

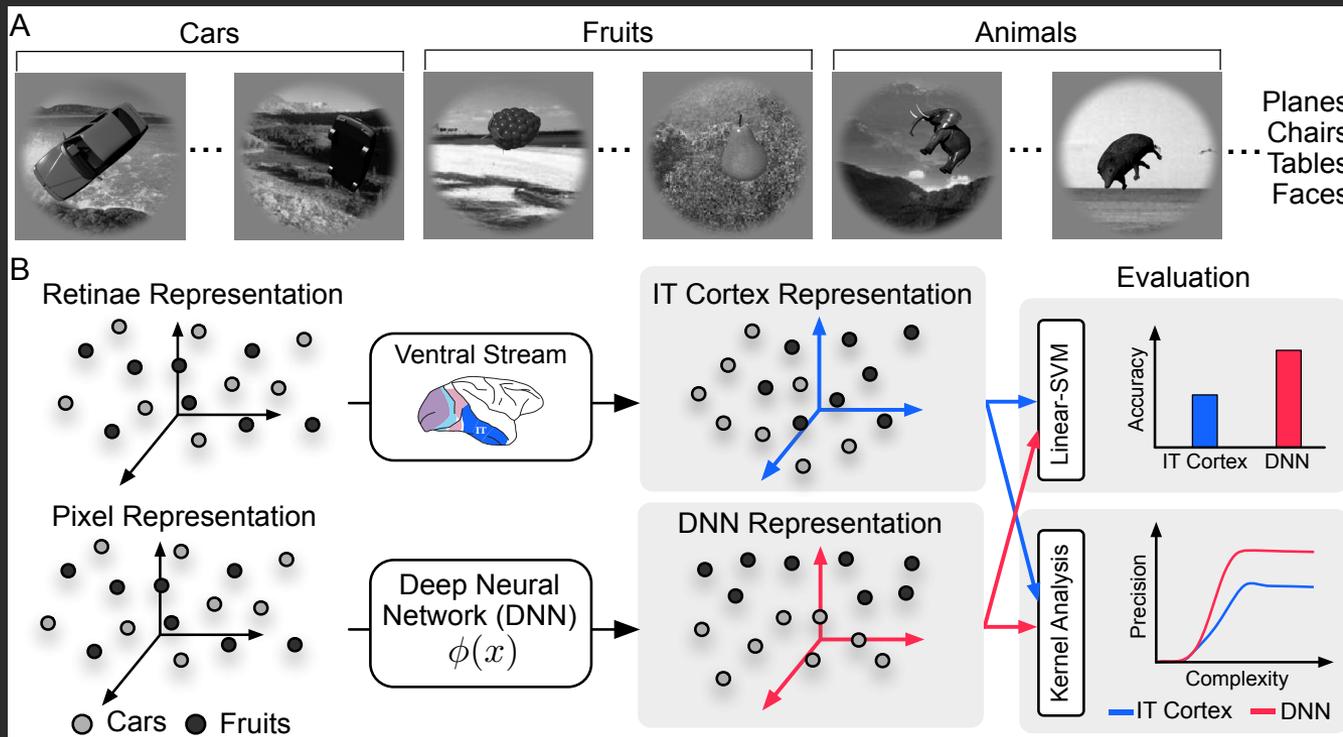
Top-5 Error Rates (lower is better)



Deep Nets vs Monkey vs Human

C.F. Cadieu, H. Hong, D. Yamins, N. Pinto, E.A. Solomon, N.J. Majaj, and J.J. DiCarlo. *Deep Neural Networks Rival the Object Recognition Performance of the Primate Visual System.*

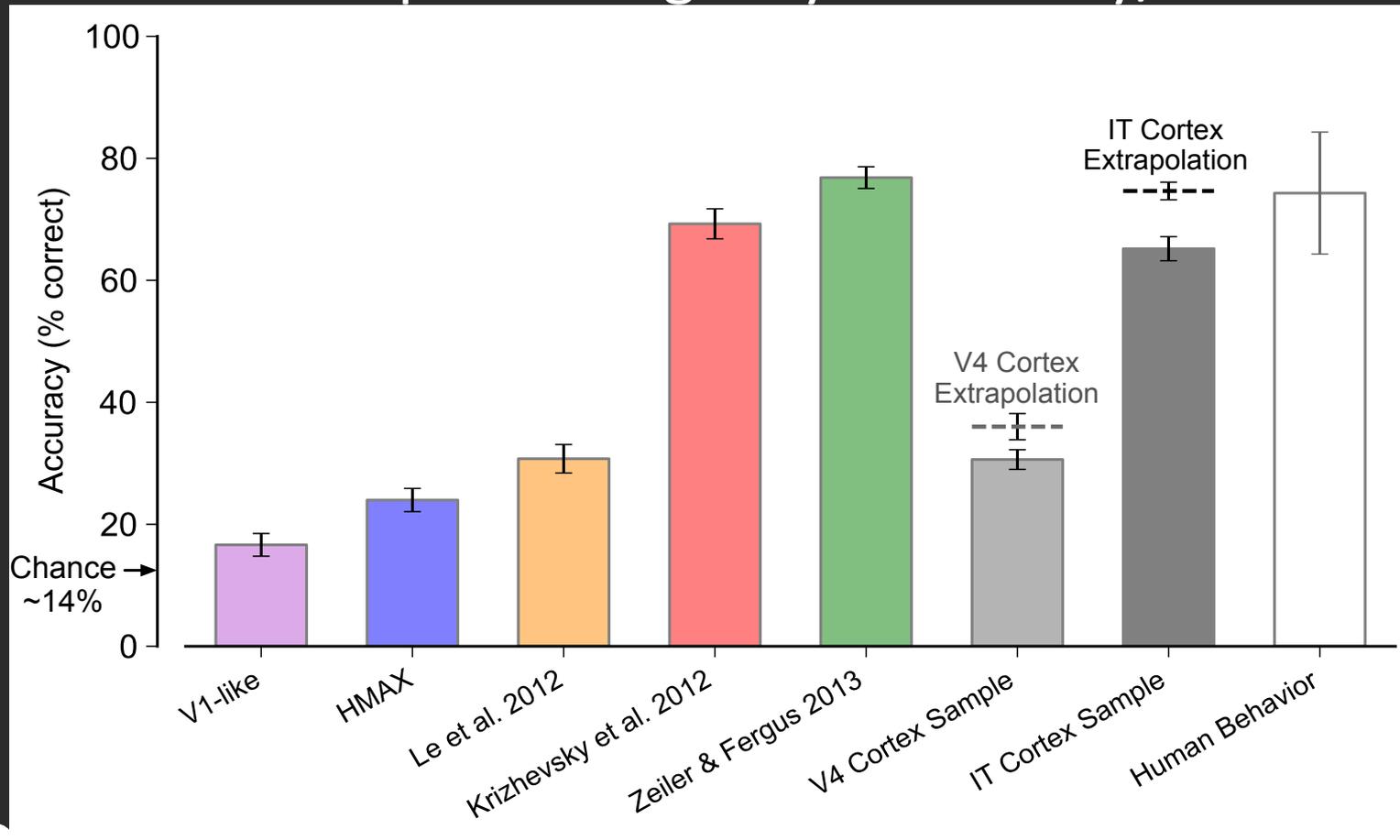
(in submission, 2013).



Deep Nets vs Monkey vs Humans

[Cadieu et al.]

- Rapid presentation experiments (100ms)
- Feed-forward processing only in monkey/humans



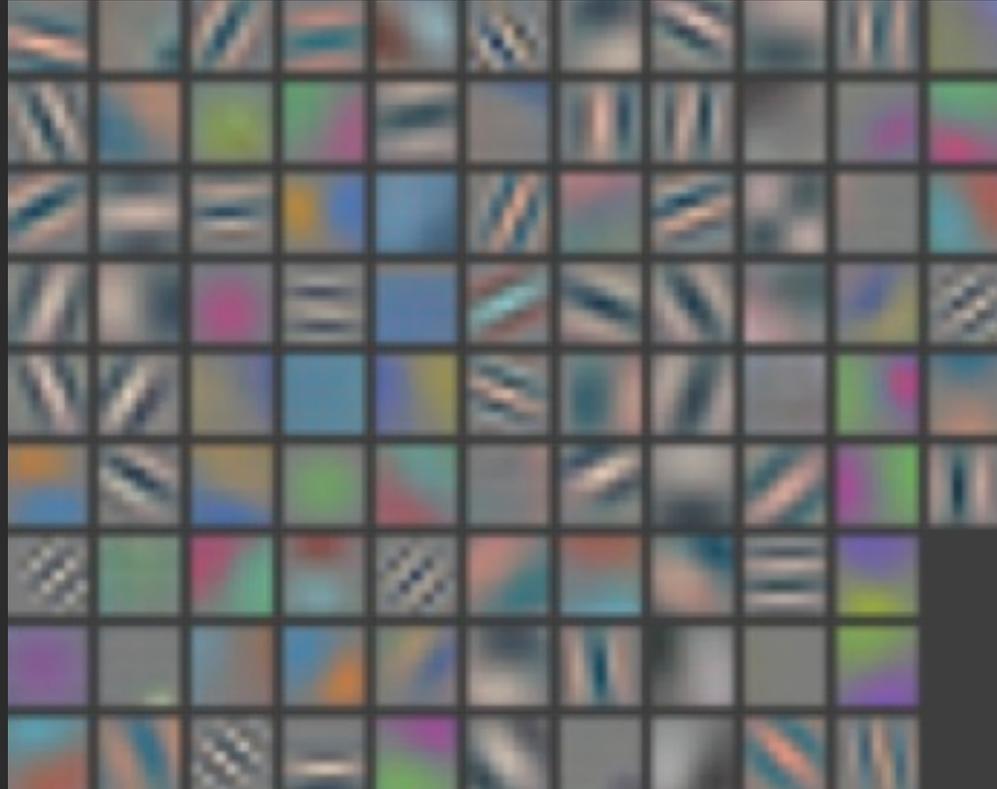
Scaling to 10,000 Categories

- Goal: general model useful for multiple markets.
- Lower layers share useful information.
- Higher layers specialize.
- Other models:
 - real estate, e-commerce, stock, consumer, wedding, surveillance, satellite, medical, etc.

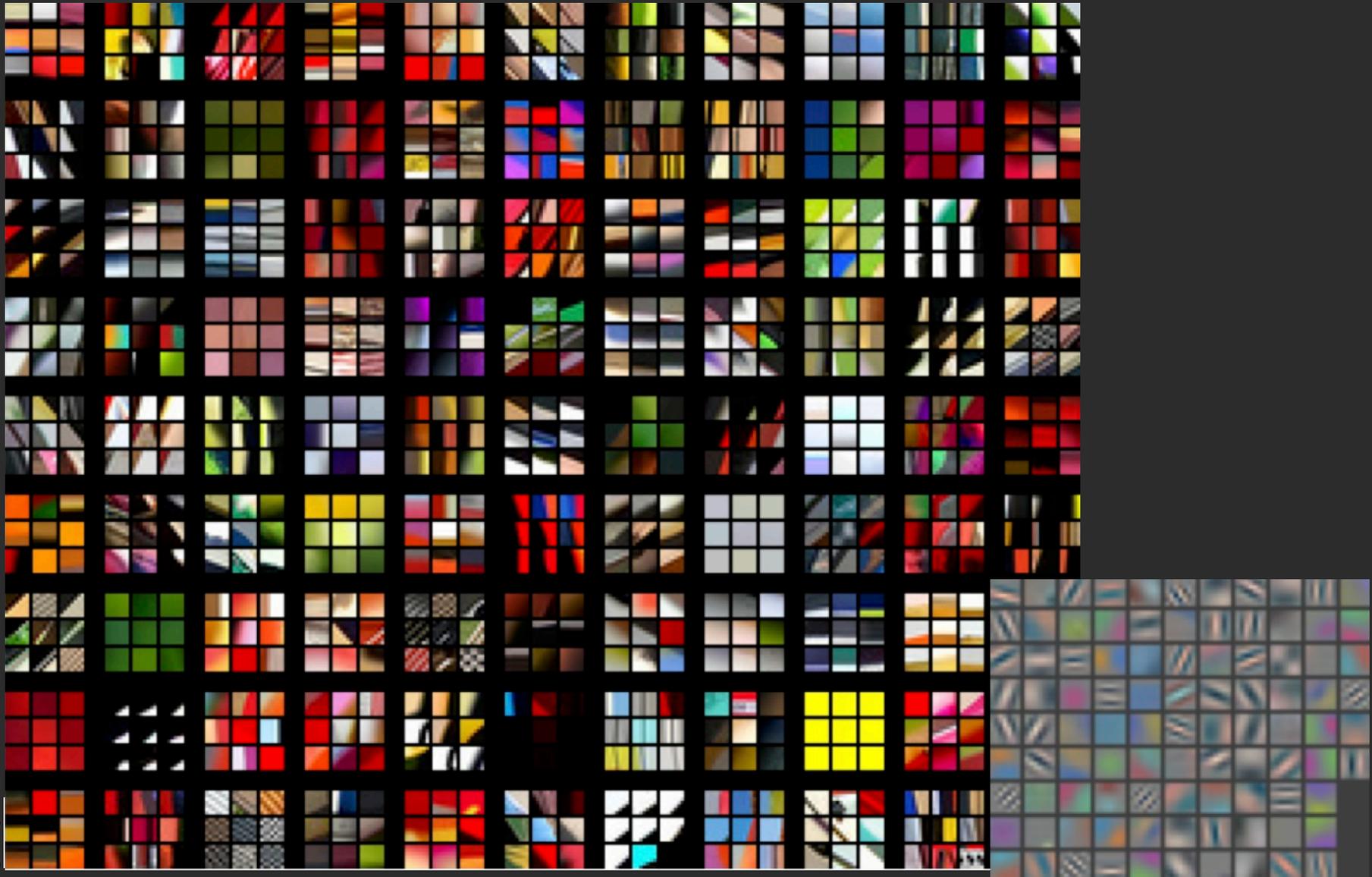
Understanding the Models: Visualizations are Key

- Visualization technique based on Deconvolutional Networks (my PhD work)
- Applied to convolutional neural networks
 - determine what each layer learns
 - provides insight for architecture selection

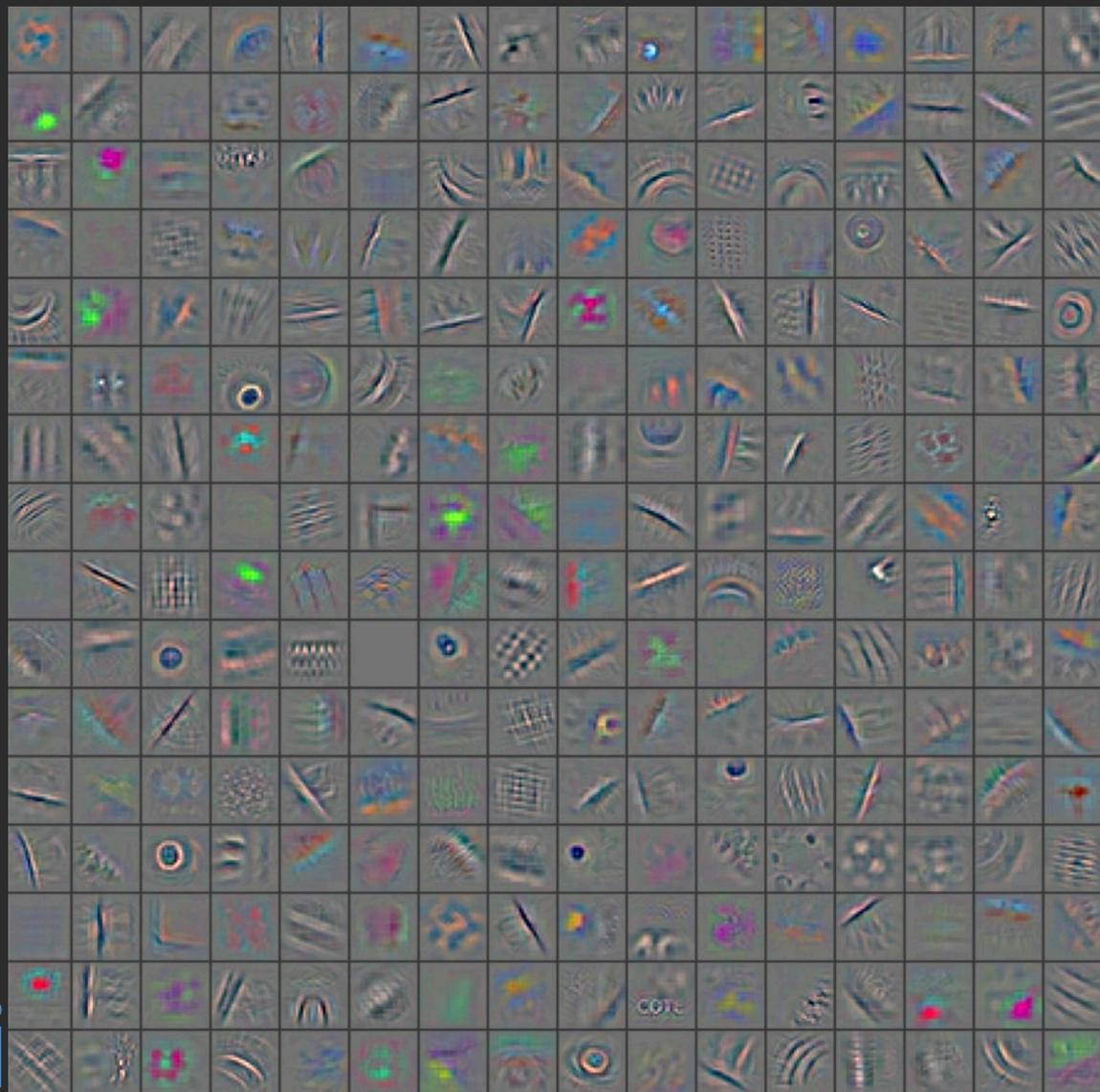
Layer 1: Filters



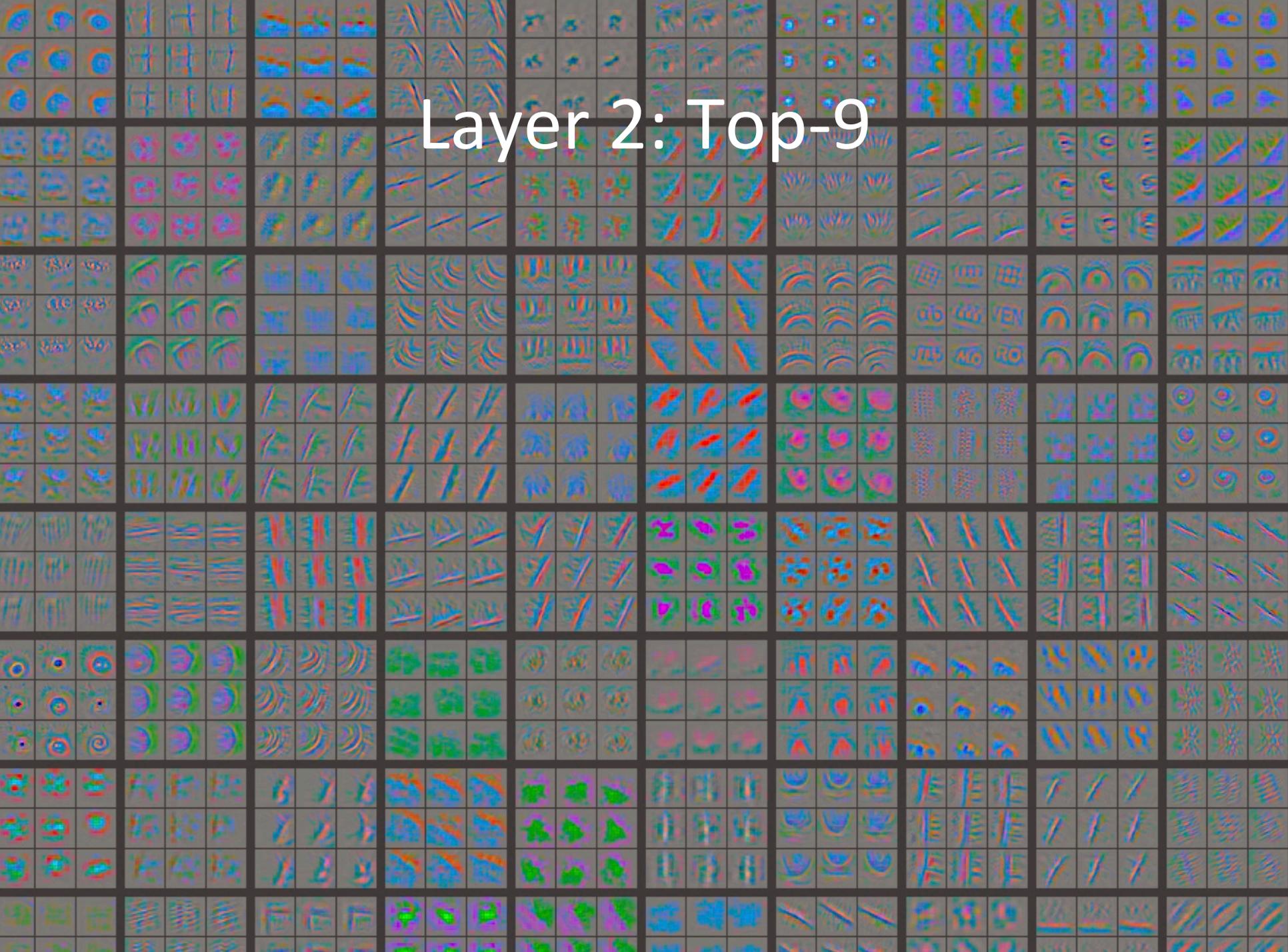
Layer 1: Top-9 Patches



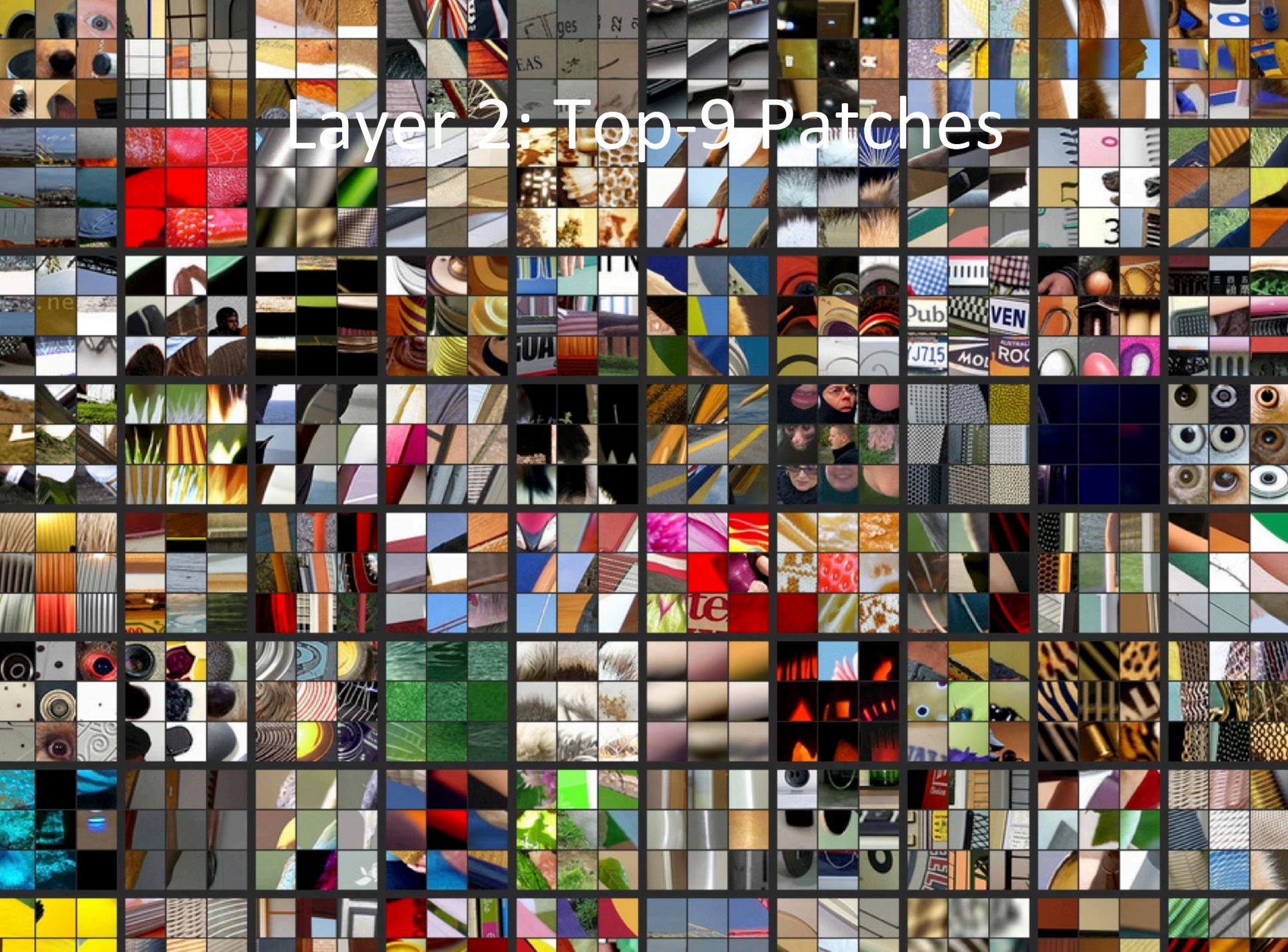
Layer 2: Top-1



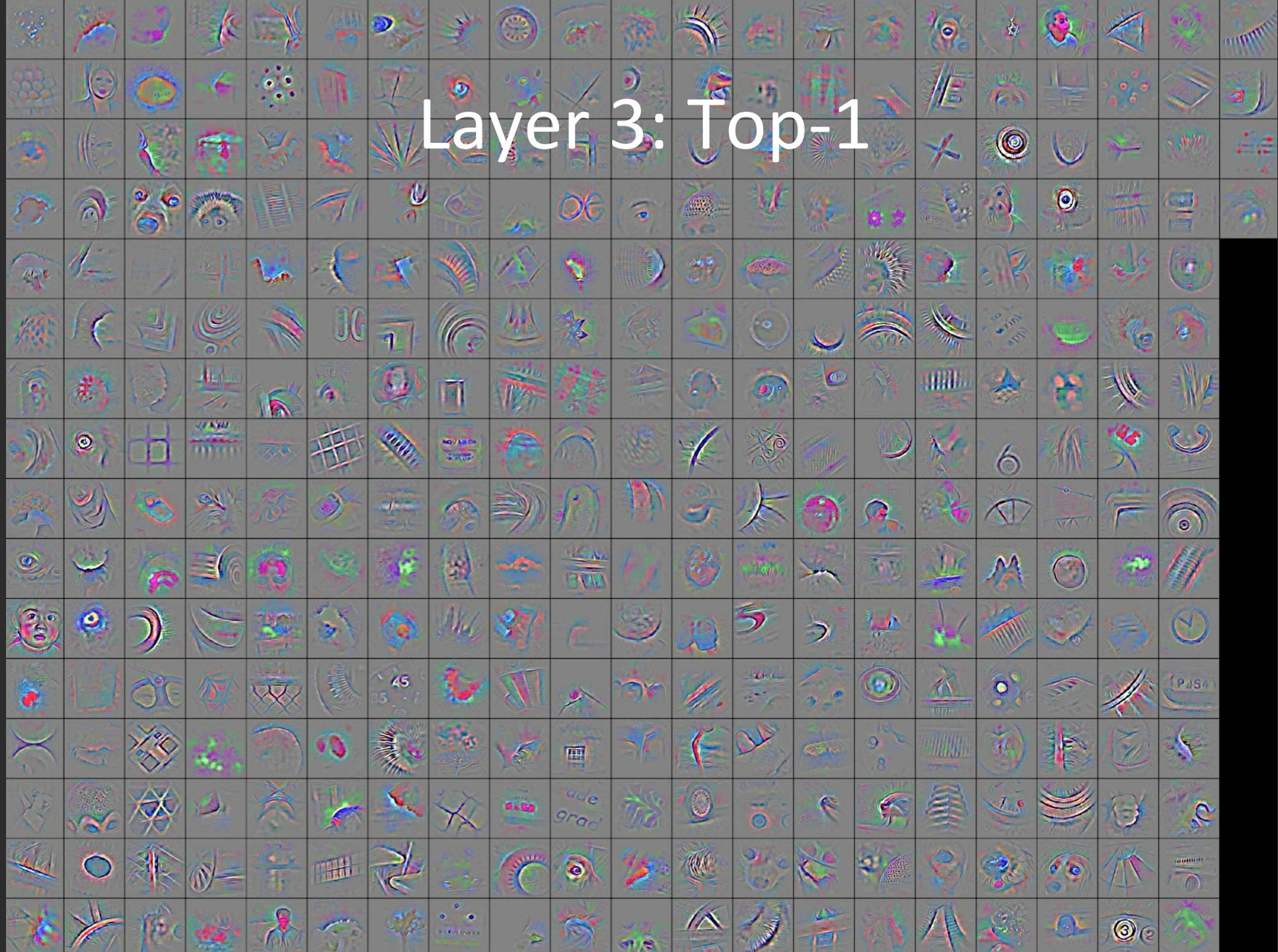
Layer 2: Top-9



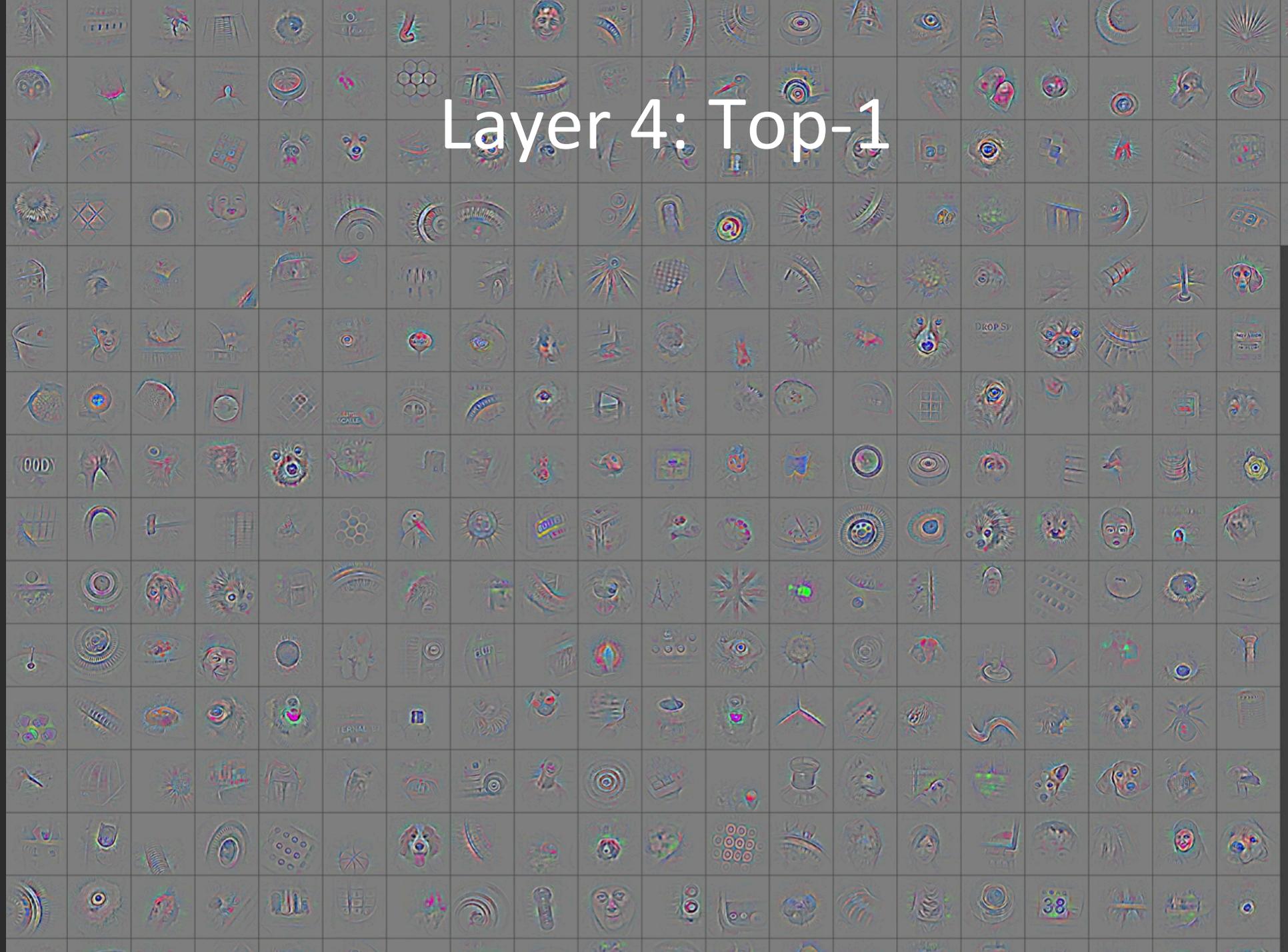
Layer 2: Top-9 Patches



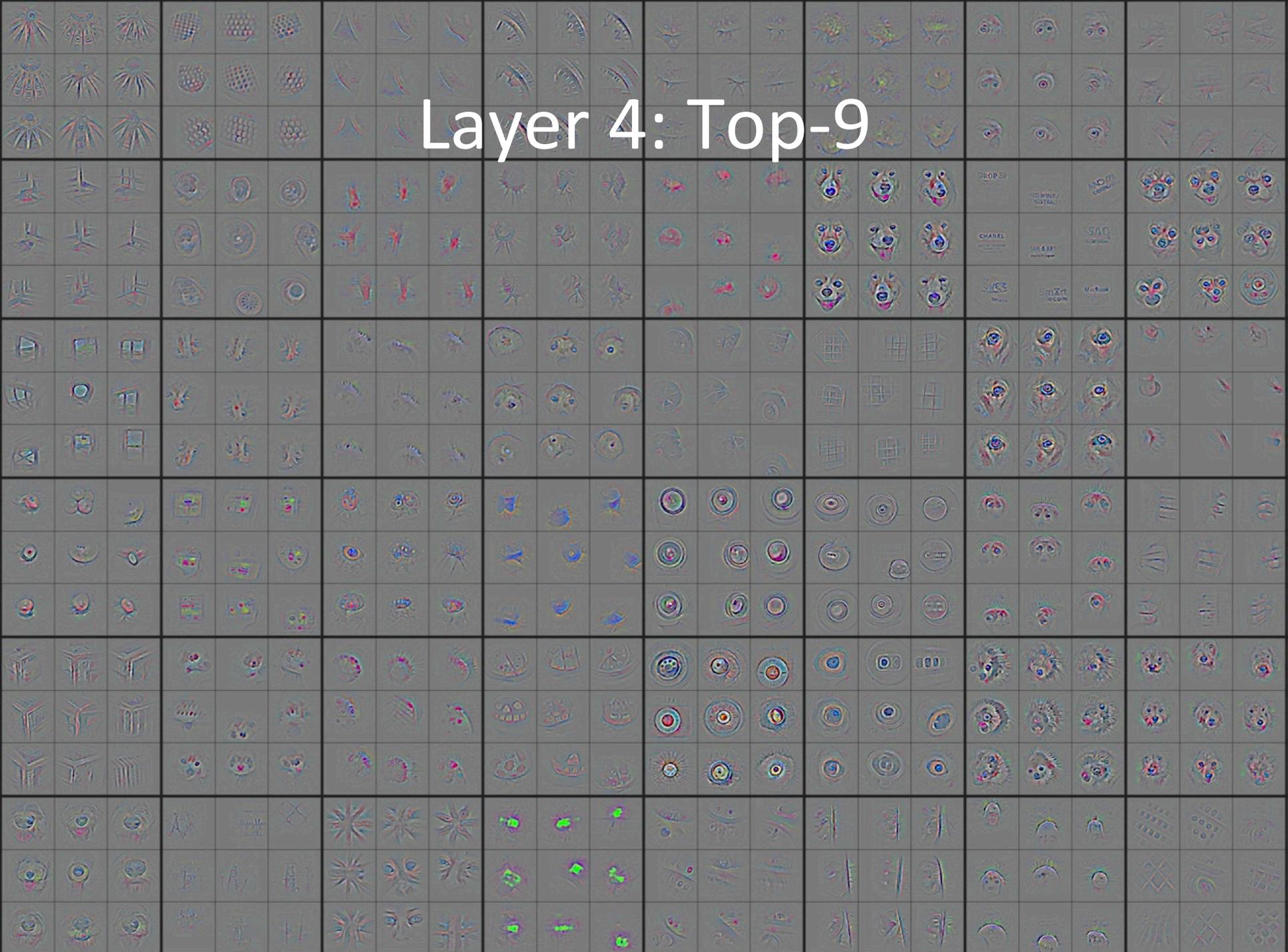
Layer 3: Top-1



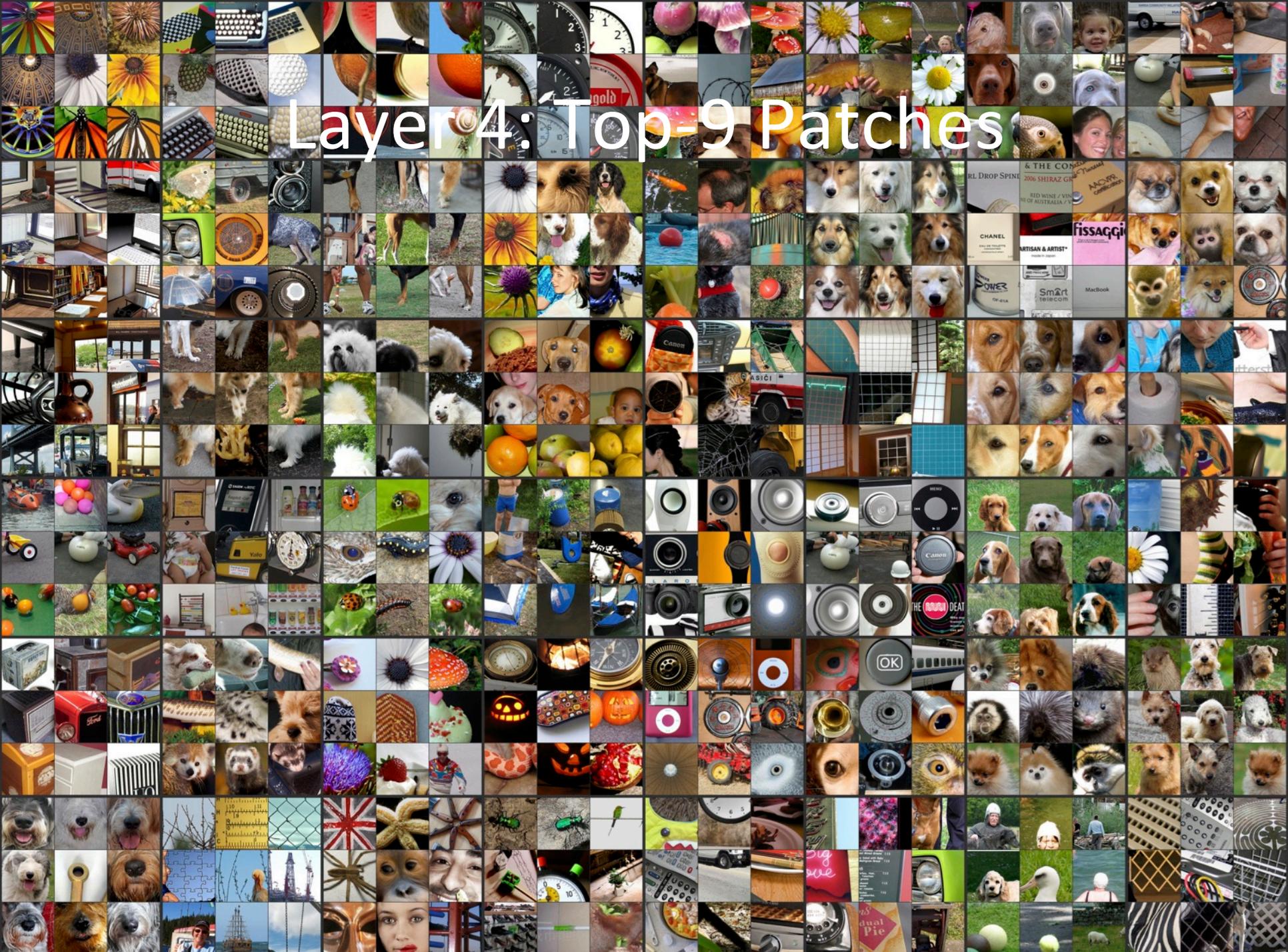
Layer 4: Top-1



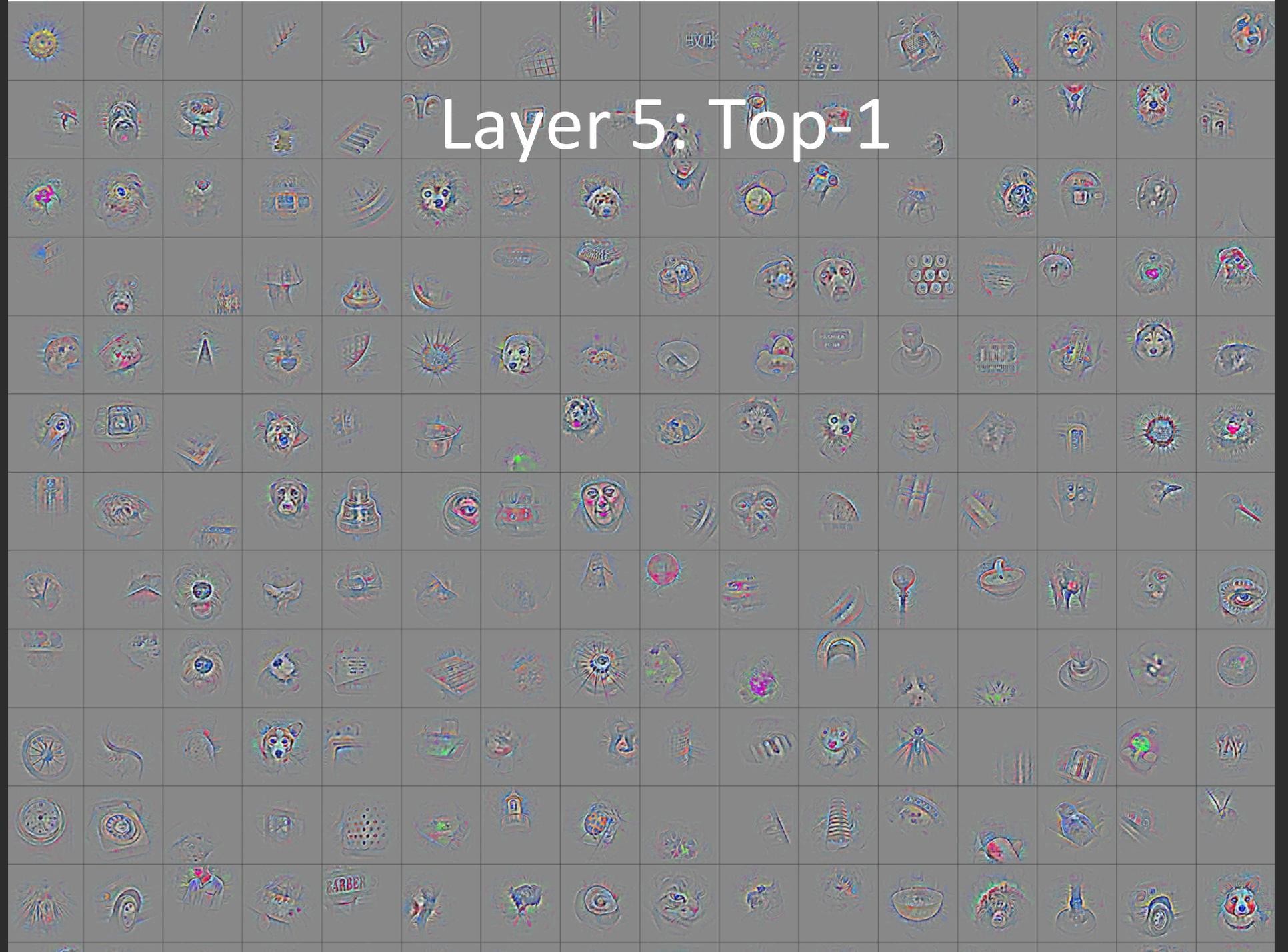
Layer 4: Top-9



Layer 4: Top-9 Patches



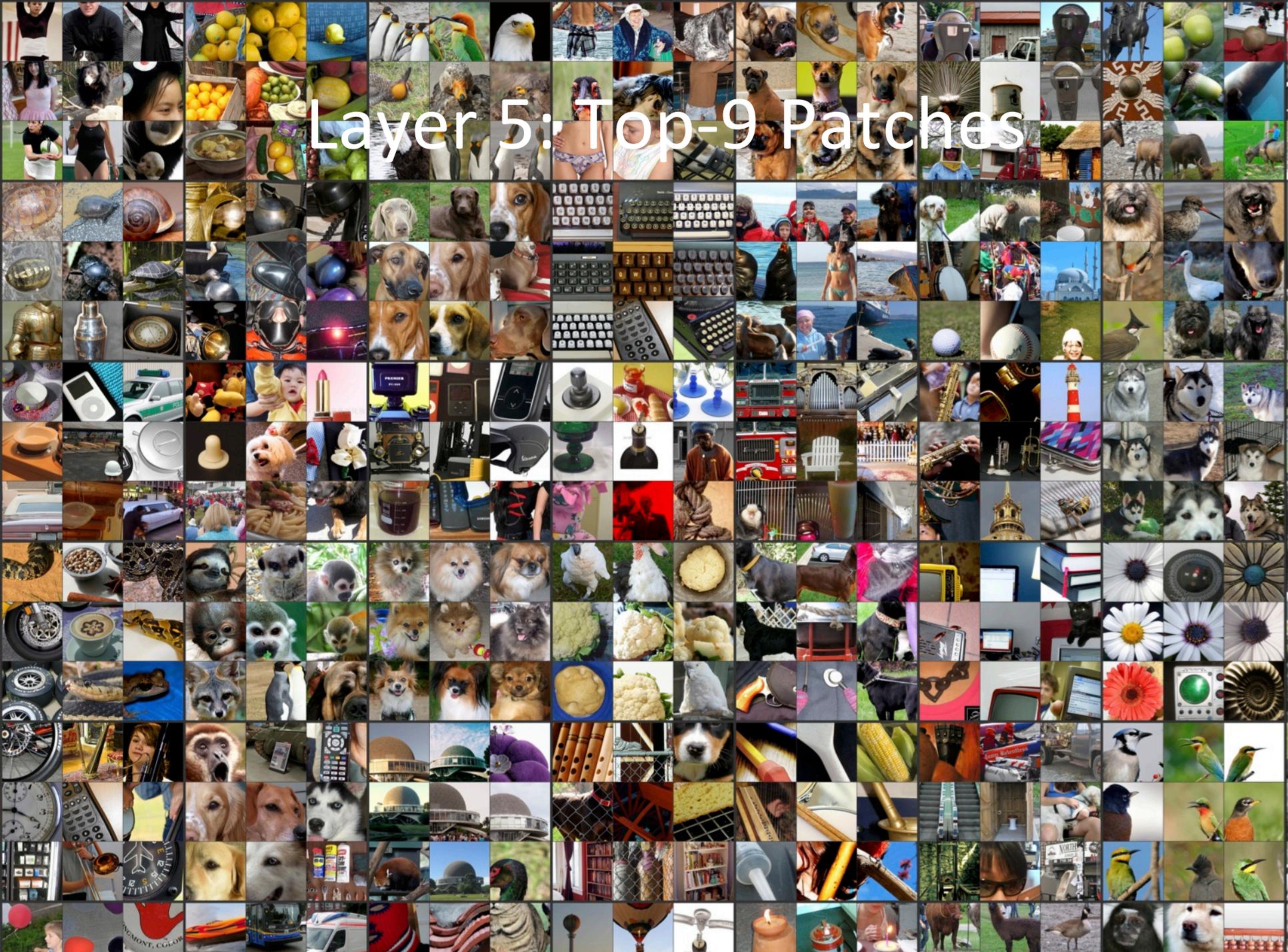
Layer 5: Top-1



Layer 5: Top-9



Layer 5: Top-9 Patches





Consumer Photos



Shopping



Stock Photos



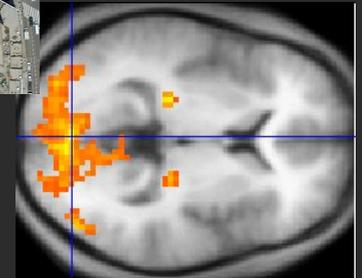
Brand safety

Ad Targeting



Satellite

Medical



beach sunset jump

Go



clarifai

hats

Go



sweaters

Go



Mobile Apps

TAGIT

powered by clarifai

CHOOSE IMAGE

TAKE PICTURE



toy; plush; teddy; still life;

SHARE

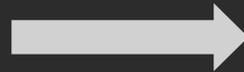


small; dog; mammal; cute;

SHARE

Our Implementation

- Written completely in-house
 - 2-30x faster than open source variants
 - optimized cpu and gpu versions
 - transitioning to OpenCL



About Us



Matthew Zeiler, CEO



Geoff Hinton



Yann LeCun



Rob Fergus



Jeff Dean



Adam Berenzweig, CTO



About Us

7 employees

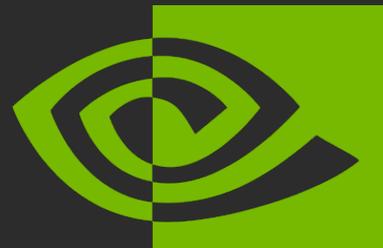
[We're Hiring!]

New York Based

Seed funded

API: early beta

[Try it!]



nVIDIA®



clarifai

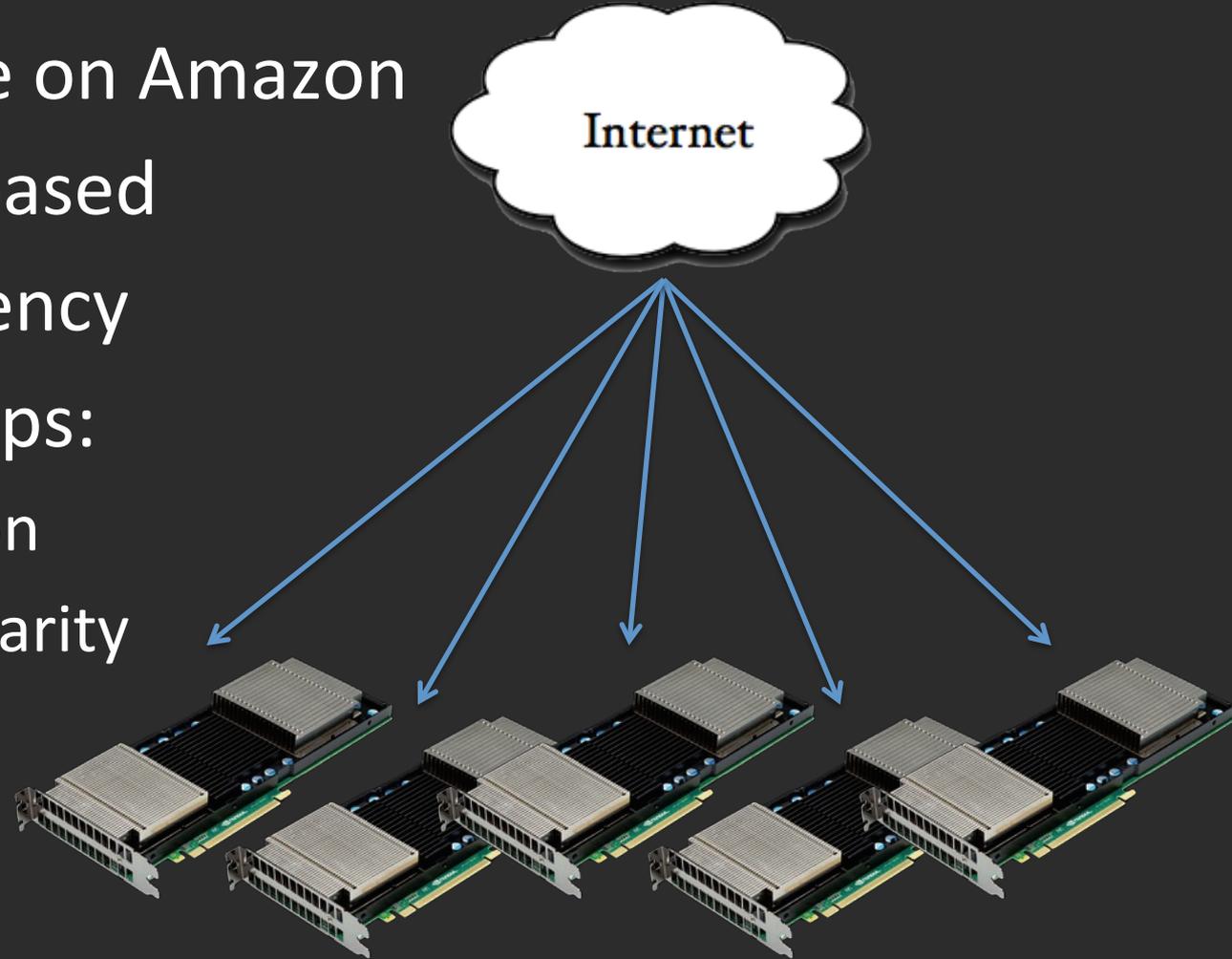
About Us

Get Data. Innovate. Repeat.

1. Enable deep learning for everyone
→ API
2. Get data: strategic products, partners.
3. Innovate: research areas, solve real-world problems.
4. Support entrance into new verticals.

API: developer.clarifai.com

- Built to scale on Amazon
- Nvidia gpu based
- <100 ms latency
- Supported ops:
 - classification
 - image similarity



Tutorial

Sign up on www.clarifai.com for newsletter.

developer.clarifai.com

Thanks!

Try it out:

www.clarifai.com

Sign-up for newsletter to get API invite!