

Lean AI with Deep Learning and AutoML

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All Slides, Samples, References, Papers at

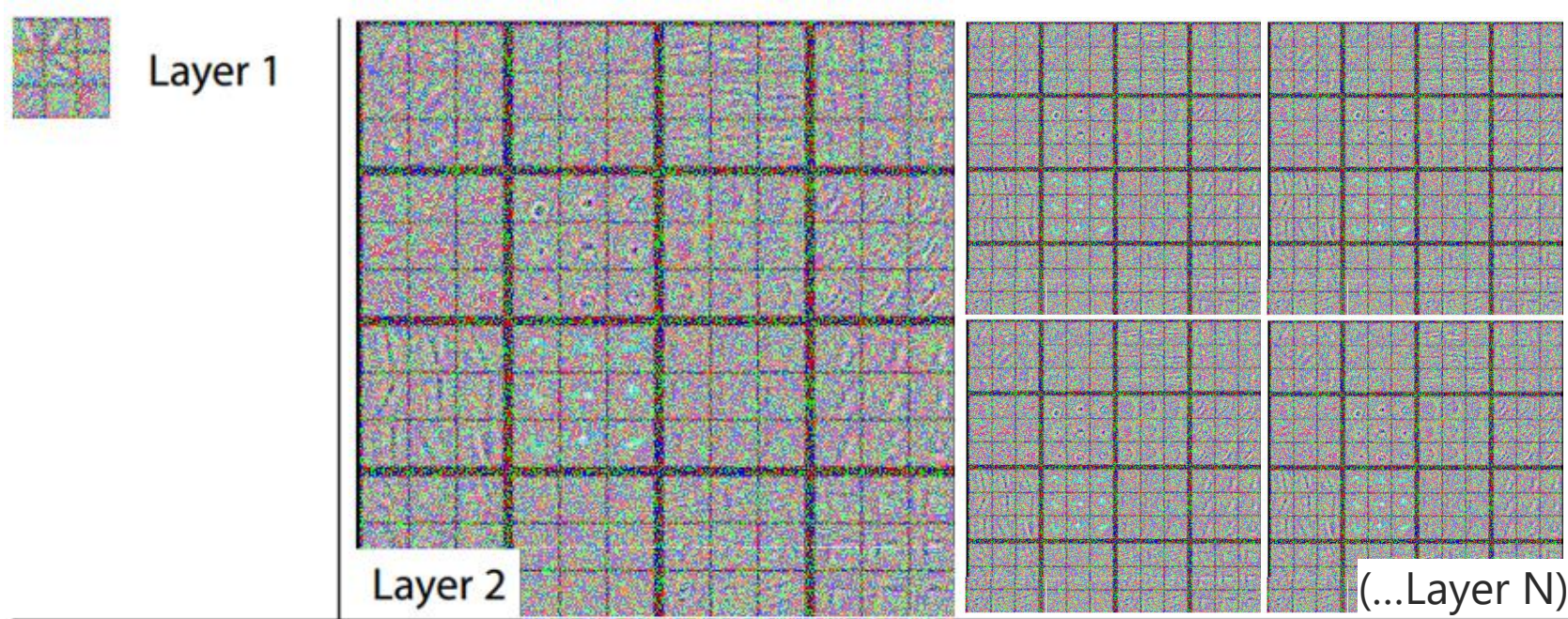
github.com/DevScope/ai-lab/

Machine Learning?

Using data to create programs
without manually building them!

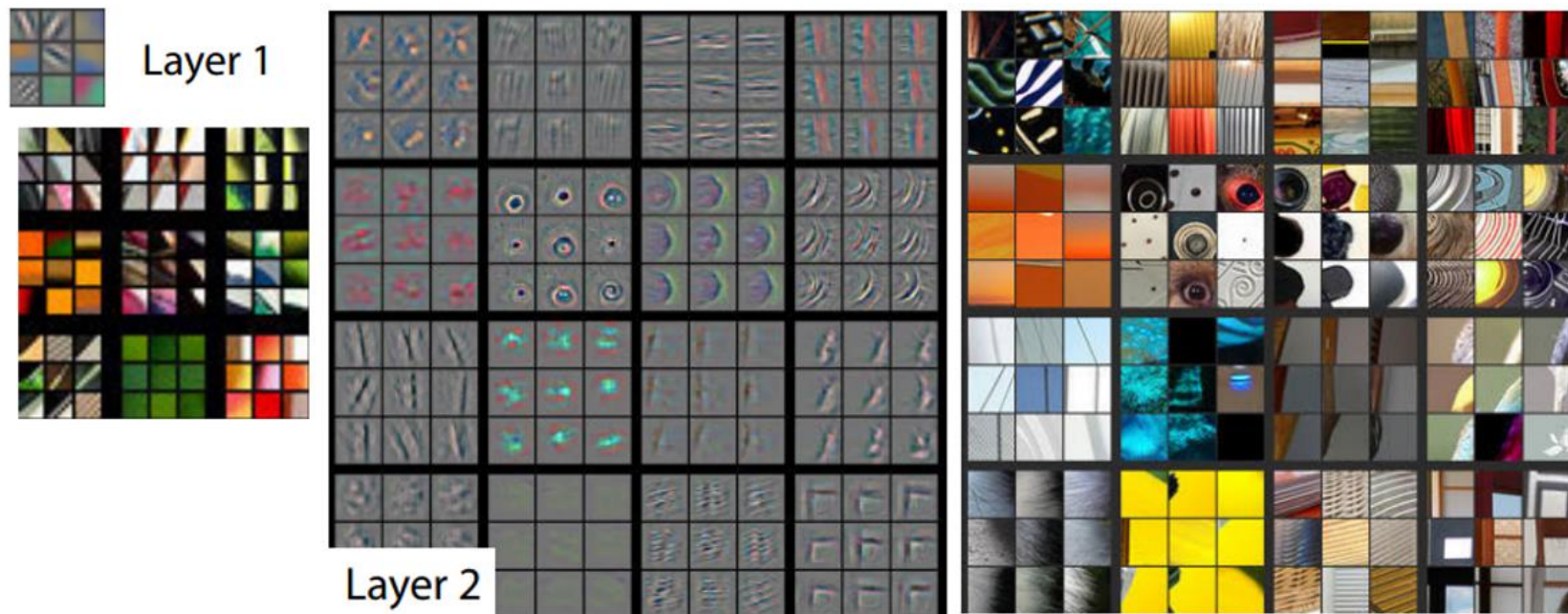
The Good News: Deep Learning

Deep Learning – Learning by *Layers*



****Adapted**** from *"Visualizing and Understanding Convolutional Networks"*
Matthew D Zeiler, Rob Fergus

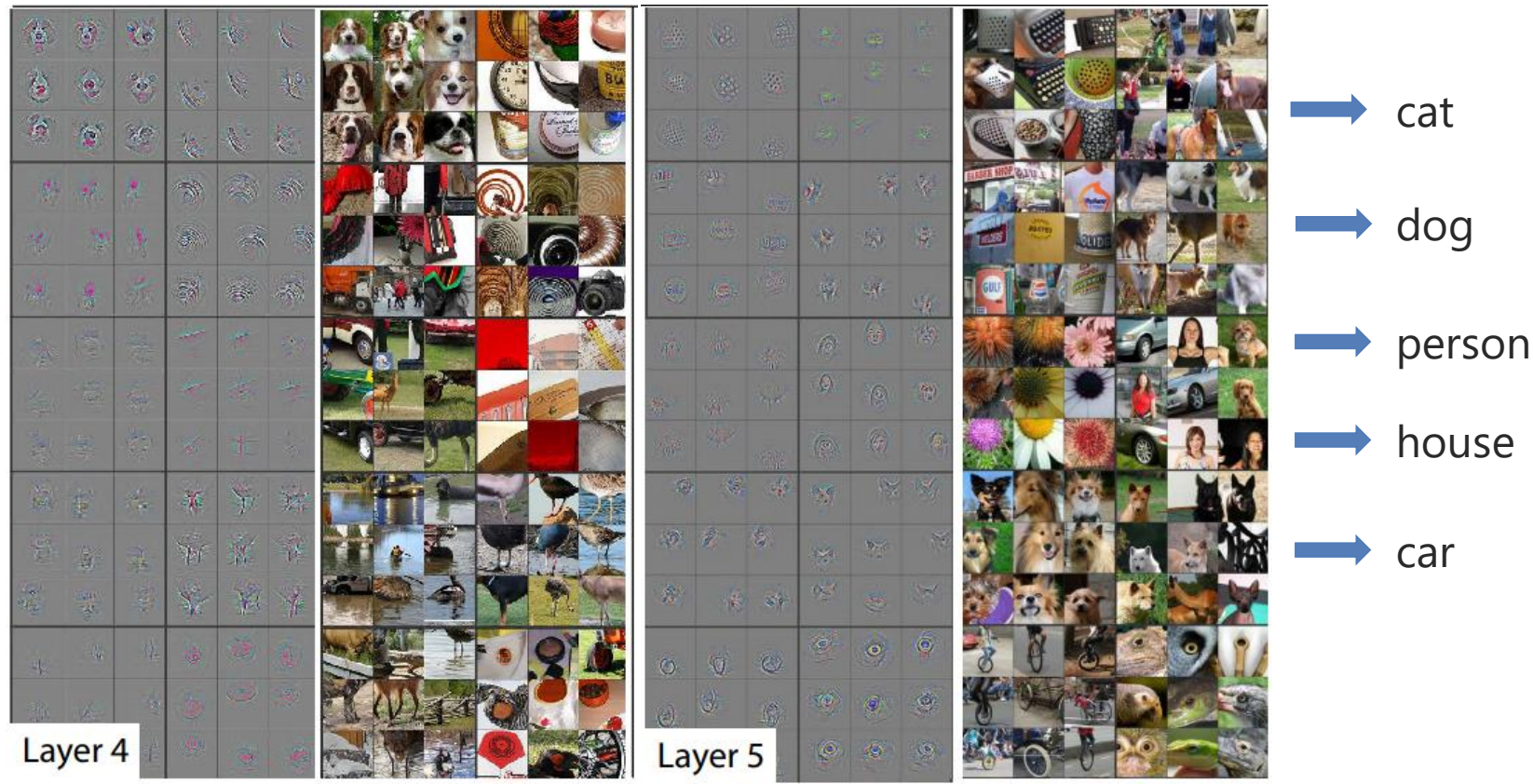
After Training (given Images + Labels)



"Visualizing and Understanding Convolutional Networks"

Matthew D Zeiler, Rob Fergus

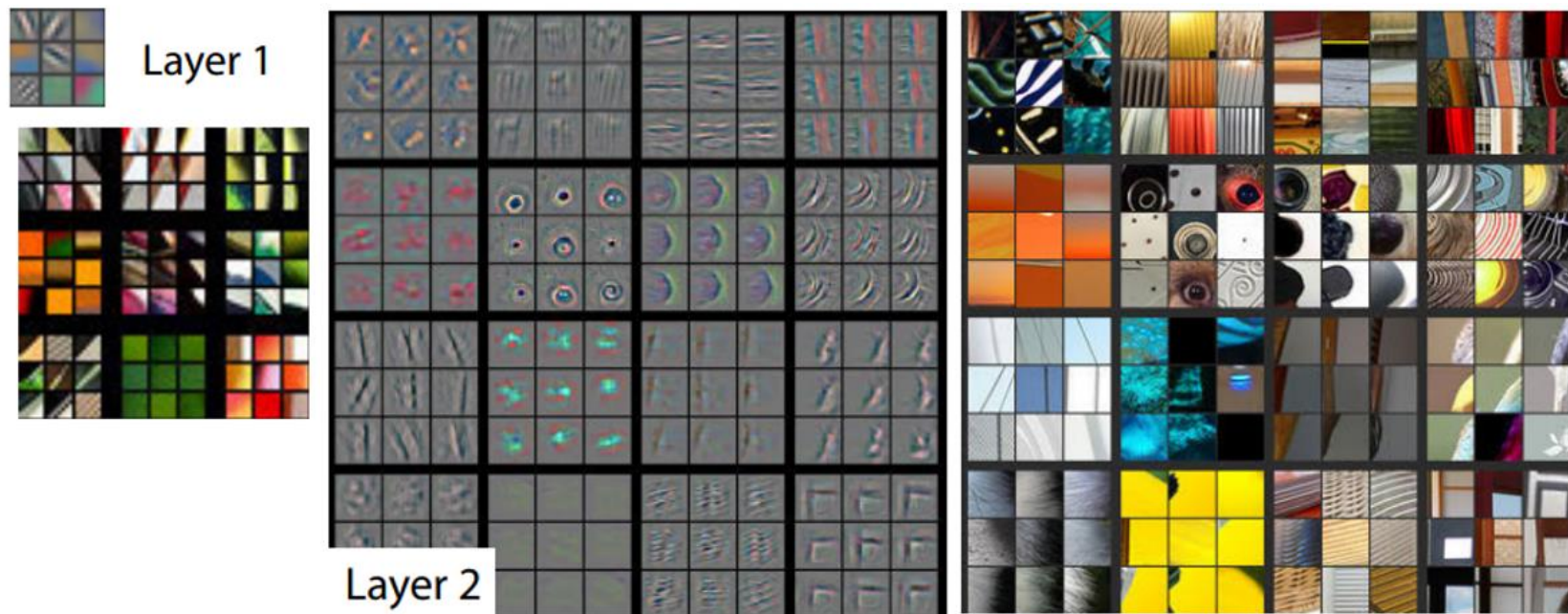
Final Layers – Higher Level Abstractions



Why so Powerful ?

- Boost Performance / State of Art
- Eliminated manual effort on filters/features
 - (kind of "AutoML")
- Enabled Reusability -> **Transfer Learning!**
 - the "NuGets" of AI/Machine Learning 😊

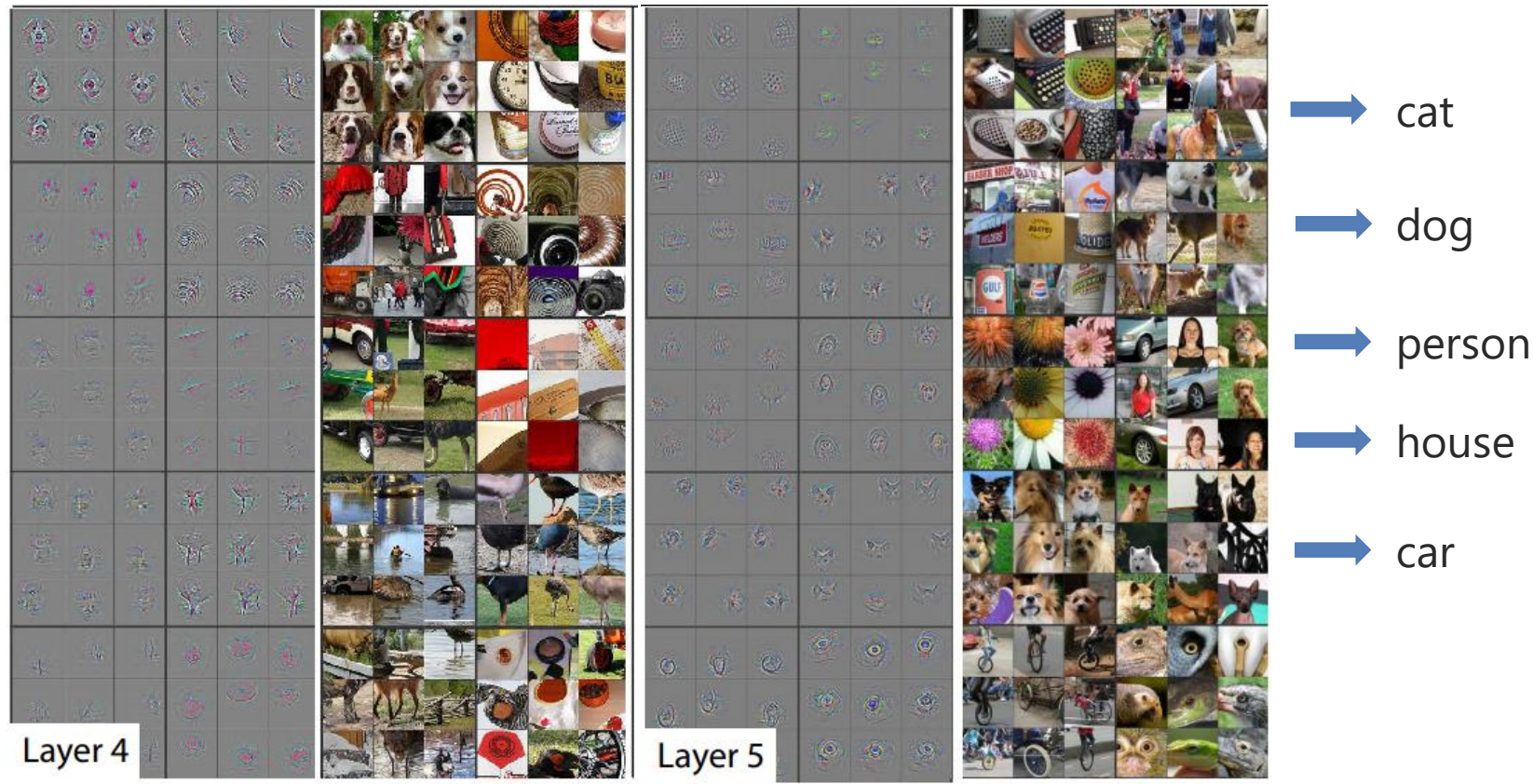
Transfer Learning – Reuse trained first layers



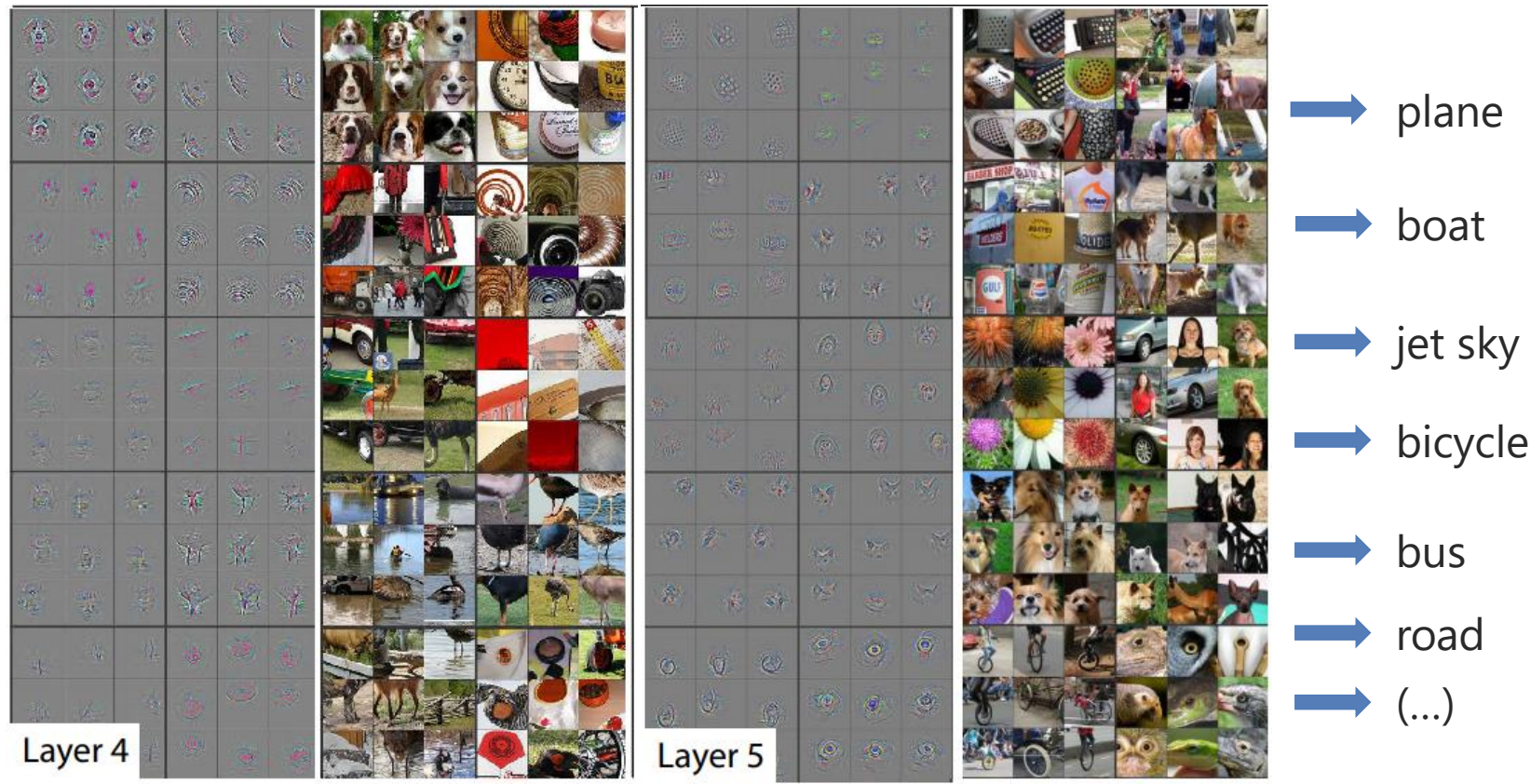
"Visualizing and Understanding Convolutional Networks"

Matthew D Zeiler, Rob Fergus

Retrain Final Layers for new Task



Retrain Final Layers for new Task



Let's dive in!

Case Study: Receipts/Invoices Segmentation

DIGITS

smardoc-segnet-model-digits6

Test One

Login







Info

About


Inter One Image

Clone Job

Delete Job





Generic Image Model



Source image

Inference visualization





Job Status Done

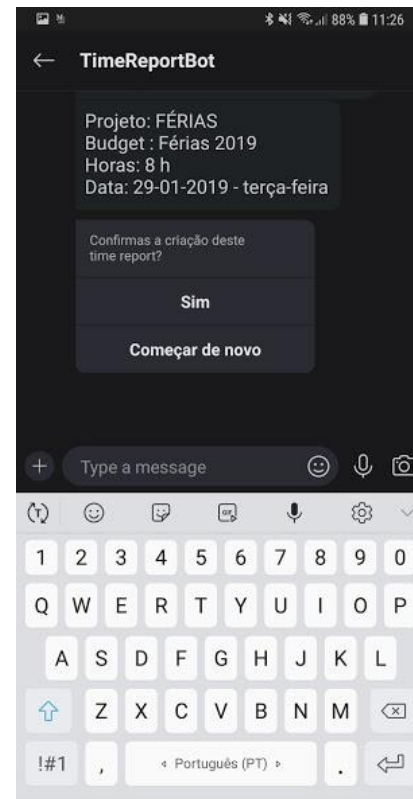
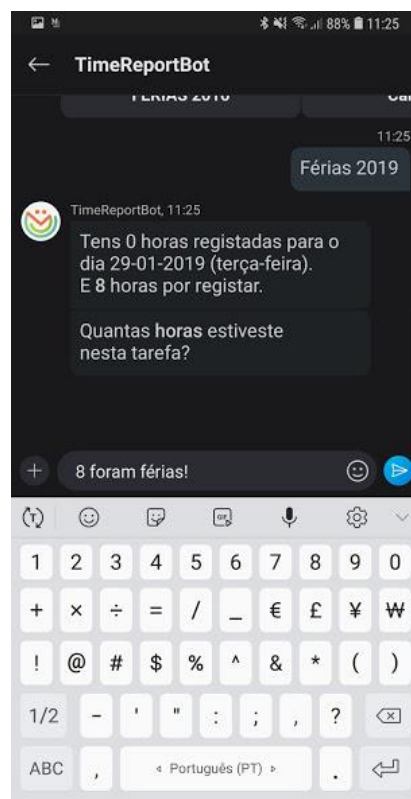
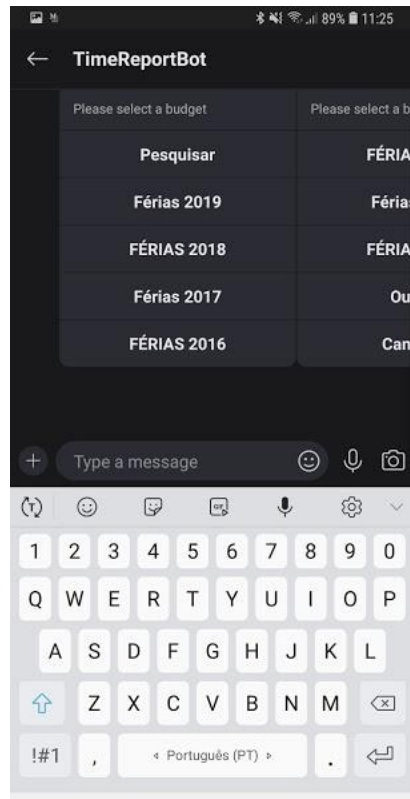
- Initialized at 12:55:58 AM (1 second)
- Running at 12:55:59 AM (3 seconds)
- Done at 12:56:02 AM
(Total - 4 seconds)

Infer Model Done

Notes

None

Case Study: Our Time Sheets Bot



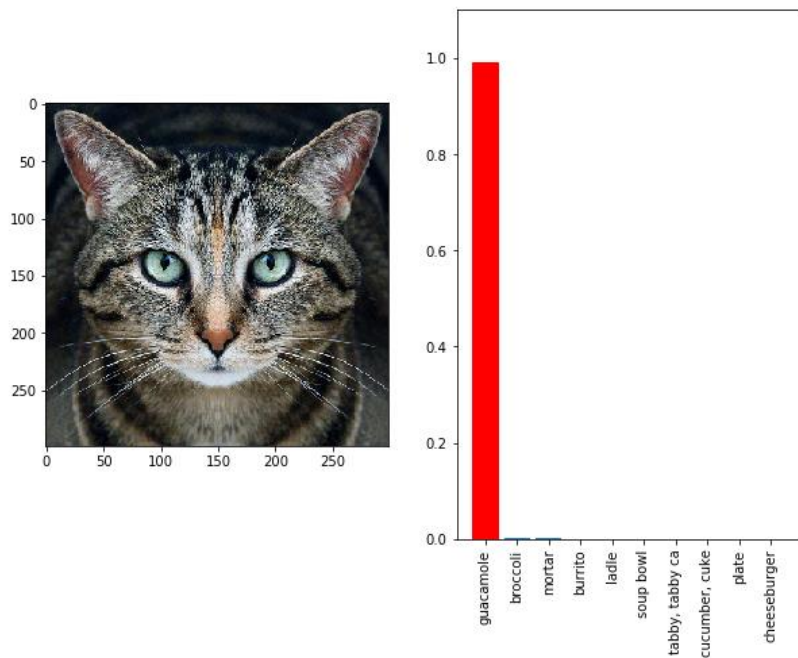
Not so fast... Machine Learning...

AI/ML/Deep Learning Safety

- **Inherit/magnify/perpetuate our biases**
- **Ethical usage**
- **Lack of “common sense”**
- We “assume” too much...
- Not error free (ever)
- Can be fooled
- Unbalanced error behavior (sub-populations)
- Black box (mostly)
- Awesome results? You probably have an issue: find it!

source

<https://www.labsix.org/physical-objects-that-fool-neural-nets/>



Questions?

Thank you!