AI and the Changing World of Work

Bill Ayers• @SPDoctor

BIWUG

DIWUG
Dutch Information Worker User Group

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We do not tolerate any behavior that is degrading to any gender, race, sexual orientation, or disability, or any behavior that would be deemed harassment or discrimination.

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MVP, MCT, MSc, MCTS, MCITP, MCSD, MCAD, MCSA, MCDBA, Professional Scrum Master, PhD, C.Eng, etc. etc.

Flow Simulation Ltd.

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@SPDoctor

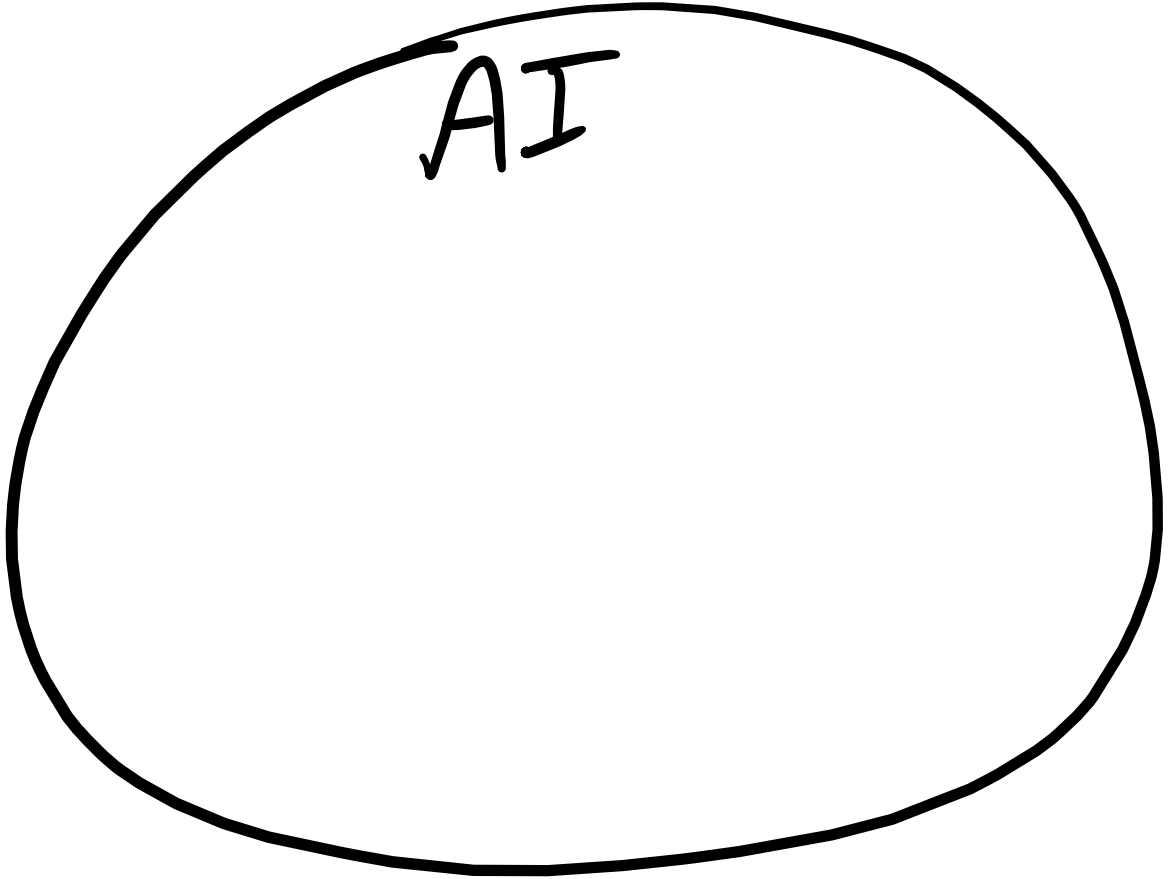
Consultant specialising in SharePoint and Office 365 Development and Architecture for Collaboration and Mobile Development

Agenda

- What is Data Science?
- What is Deep Learning?
- Transfer Learning
- Azure Cognitive Services
- What is a Graph?
- Syntex, Viva
- Where will it end?
- Conclusions

AI, ML and more...

- Artificial Intelligence
- Machine Learning
- Deep Learning



AI, ML and more...

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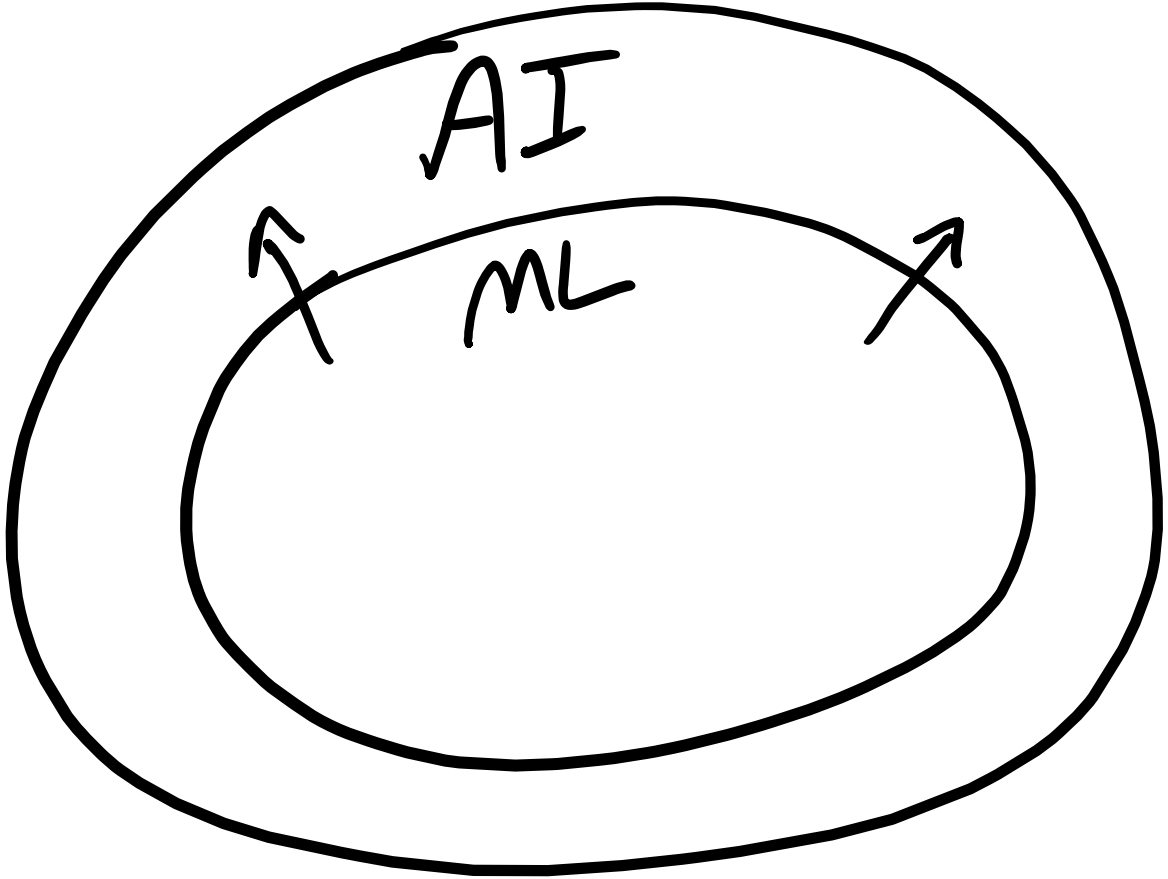
- Deep Learning



AI, ML and more...

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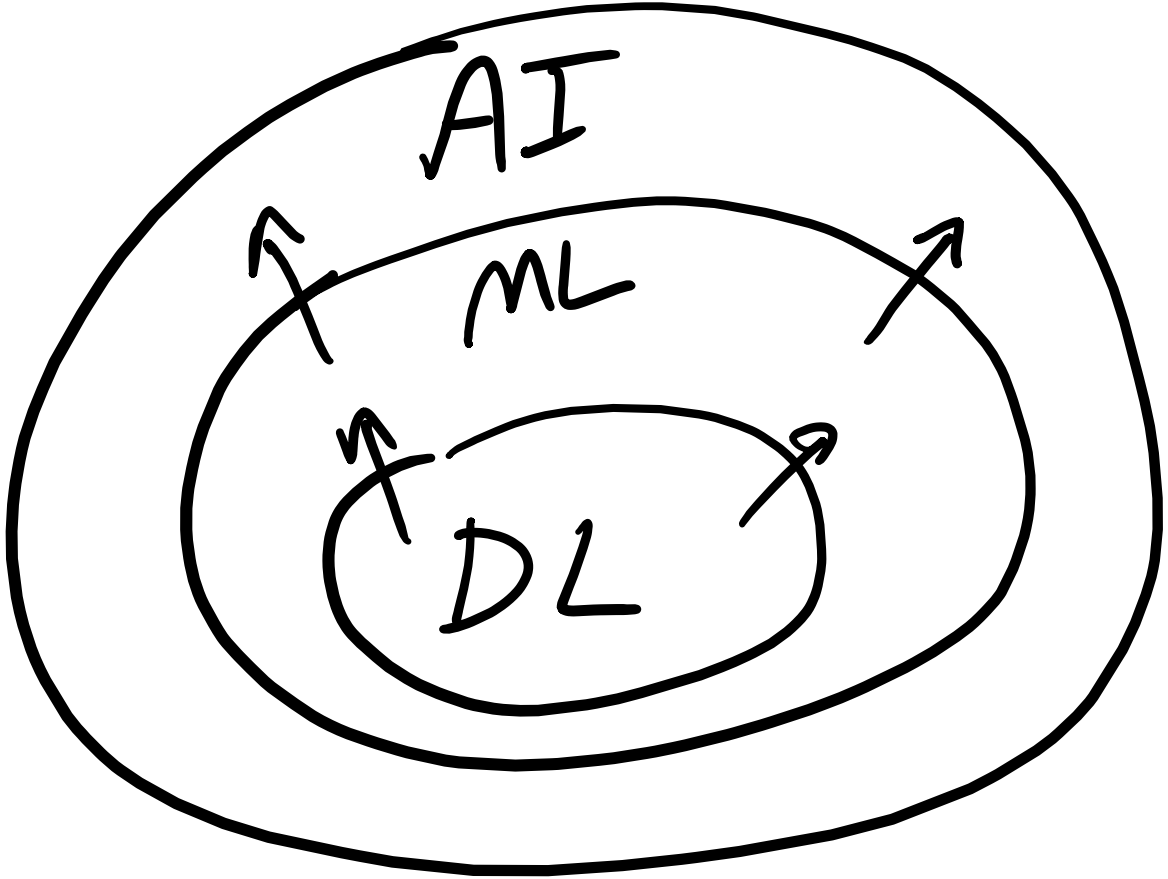
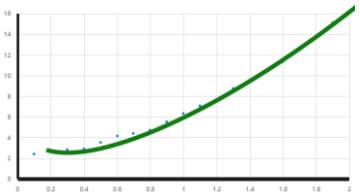


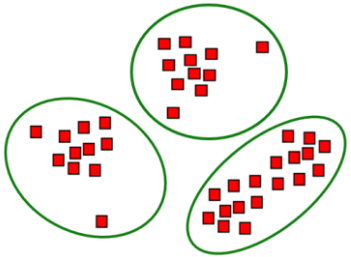
Data Science: Looking for patterns in data

- Given some empirical data, can we build a model to make a prediction for a case where we don't have data?

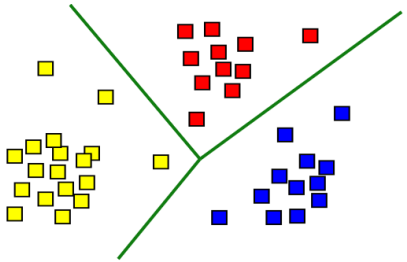
Regression



Clustering



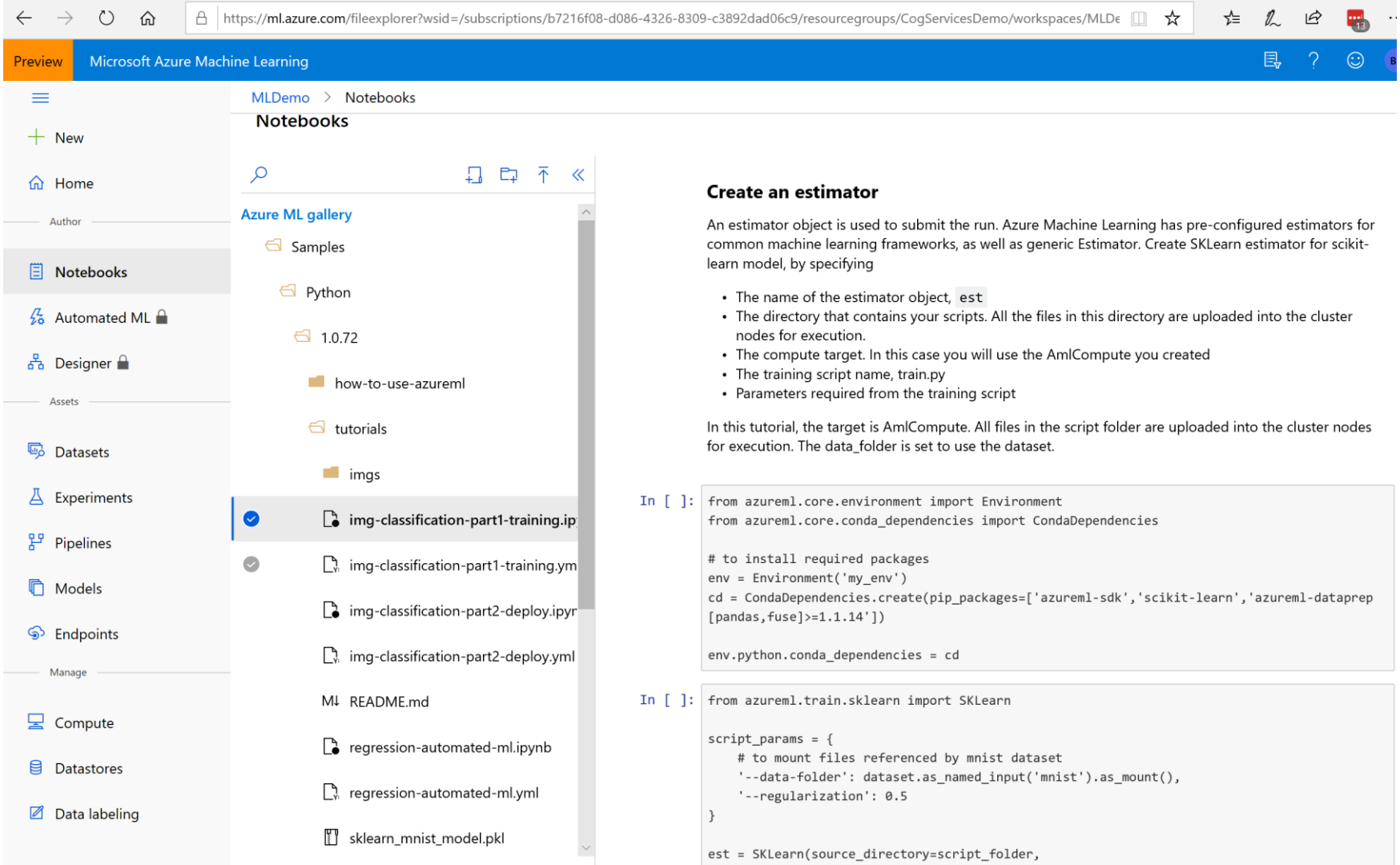
Classification



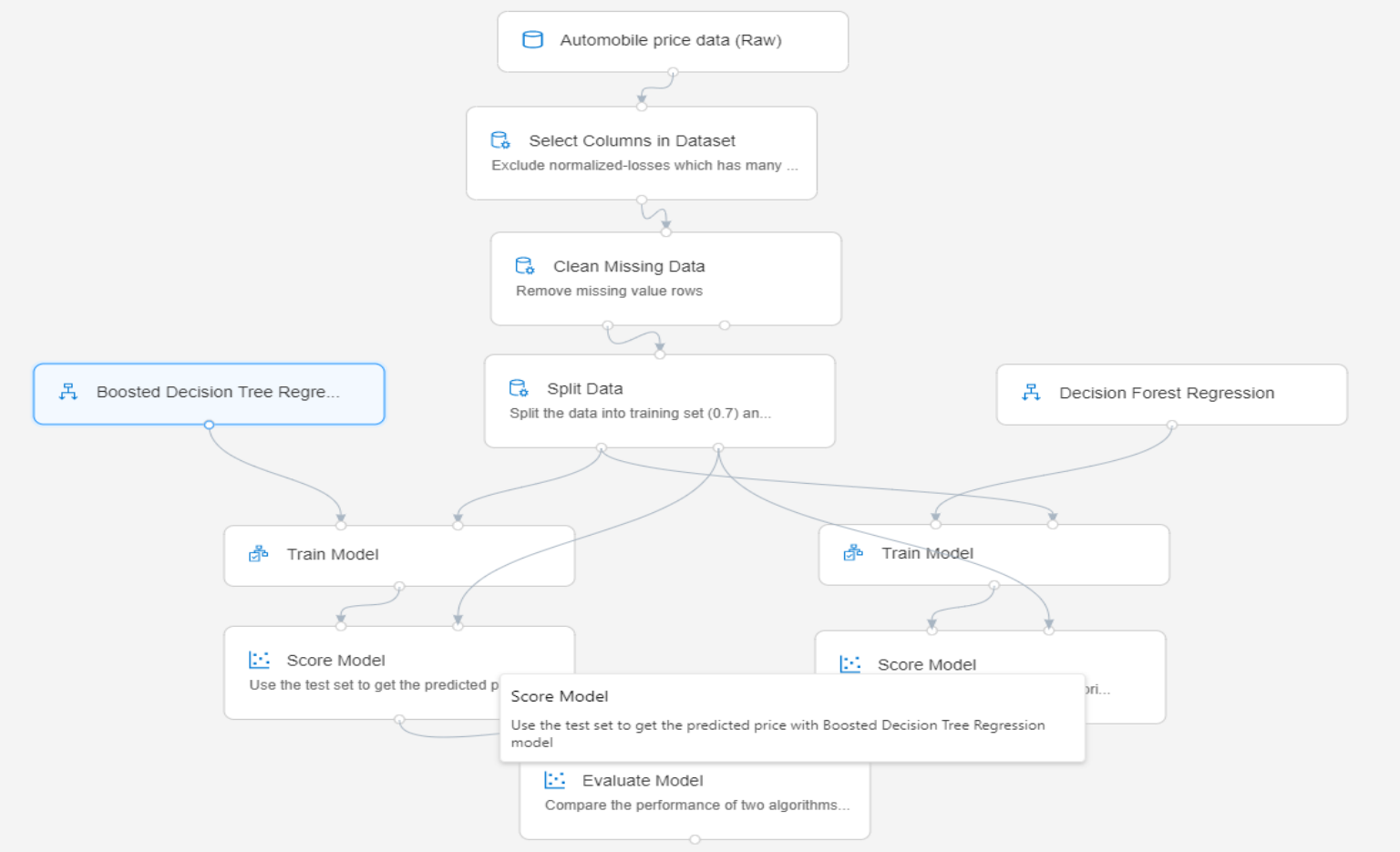
- Using toolkits like PyTorch, TensorFlow, etc., Jupyter notebooks
- Using e.g. Azure ML Workbench
- Using AutoML

A lot of Data Science is ‘just’ statistics

- Dealing with real problems with millions of data points and hundreds of dimensions
- Using an array of mathematical techniques such as regression algorithms
- Using skill to find good models and then running “experiments” to find the best one, and the correct **hyperparameters**
- Machine learning is one tool that can speed up the process and manage quantities of data that were previously impossible
- Tools like AutoML can use machine learning to automate the process of finding the right model


https://ml.azure.com/fileexplorer?wsid=/subscriptions/b7216f08-d086-4326-8309-c3892dad06c9/resourcegroups/CogServicesDemo/workspaces/MLDe
Preview
Microsoft Azure Machine Learning
New
Home
Author
Notebooks
Automated ML
Designer
Assets
Datasets
Experiments
Pipelines
Models
Endpoints
Manage
Compute
Datastores
Data labeling
MLDemo
Notebooks
Notebooks
Azure ML gallery
Samples
Python
1.0.72
how-to-use-azureml
tutorials
imgs
img-classification-part1-training.ip
img-classification-part1-training.ym
img-classification-part2-deploy.ipyr
img-classification-part2-deploy.yml
README.md
regression-automated-ml.ipynb
regression-automated-ml.yml
sklearn_mnist_model.pkl
Create an estimator
An estimator object is used to submit the run. Azure Machine Learning has pre-configured estimators for common machine learning frameworks, as well as generic Estimator. Create SKLearn estimator for scikit-learn model, by specifying
The name of the estimator object, est
The directory that contains your scripts. All the files in this directory are uploaded into the cluster nodes for execution.
The compute target. In this case you will use the AmlCompute you created
The training script name, train.py
Parameters required from the training script
In this tutorial, the target is AmlCompute. All files in the script folder are uploaded into the cluster nodes for execution. The data_folder is set to use the dataset.
In [ ]:
from azureml.core.environment import Environment
from azureml.core.conda_dependencies import CondaDependencies
# to install required packages
env = Environment('my_env')
cd = CondaDependencies.create(pip_packages=['azureml-sdk','scikit-learn','azureml-dataprep[pandas,fuse]>=1.1.14'])
env.python.conda_dependencies = cd
In [ ]:
from azureml.train.sklearn import SKLearn
script_params = {
# to mount files referenced by mnist dataset
'--data-folder': dataset.as_named_input('mnist').as_mount(),
'--regularization': 0.5
}
est = SKLearn(source_directory=script_folder,

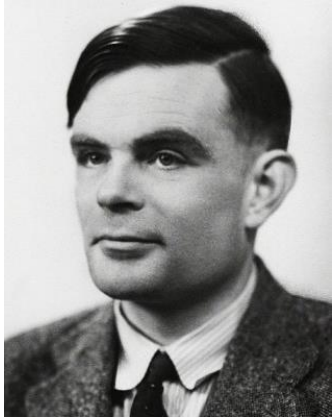
Azure ML: Automobile Price Prediction



It's "just statistics", but with a big enough problem...

- Airline pricing
- Stock market
- Computer vision
- Speech-to-text
- Language translation
- Playing games
- Fraud detection

...it looks like AI

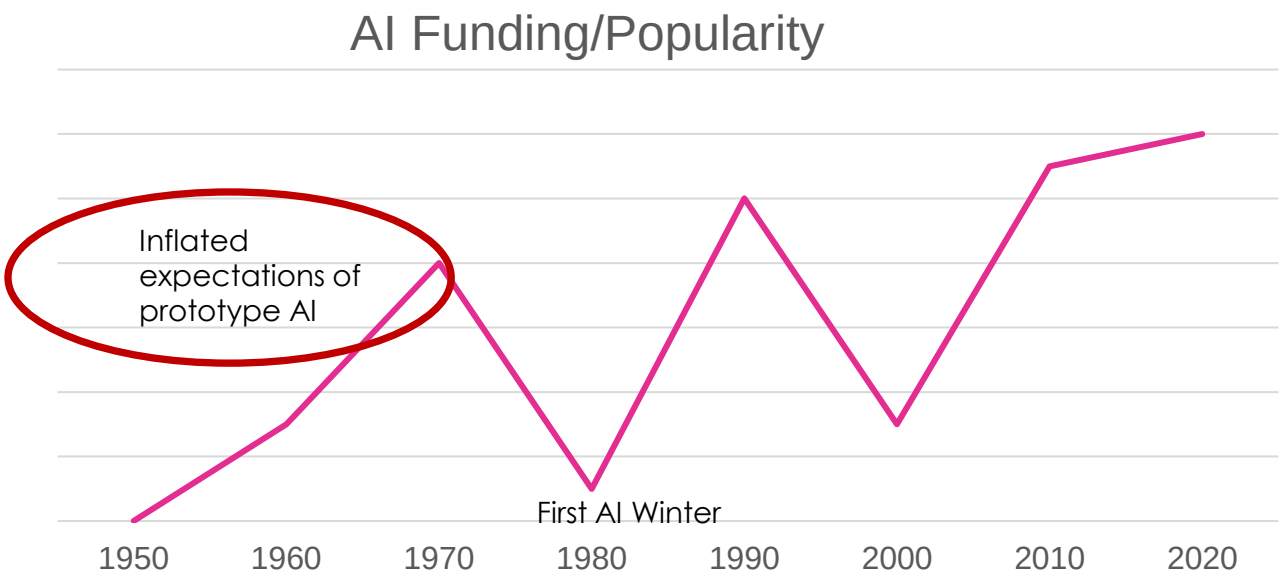


Alan Turing

may use deep learning; bounded problem in narrow domain = weak AI

AI – it's the 'Next Big Thing'...

...and has been for the last 60 years, on and off



Brainbow

- Identify individual neurons by using fluorescent proteins

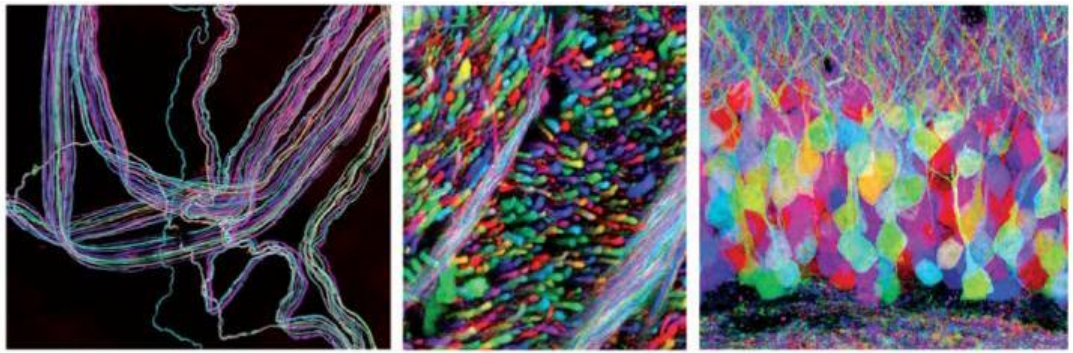
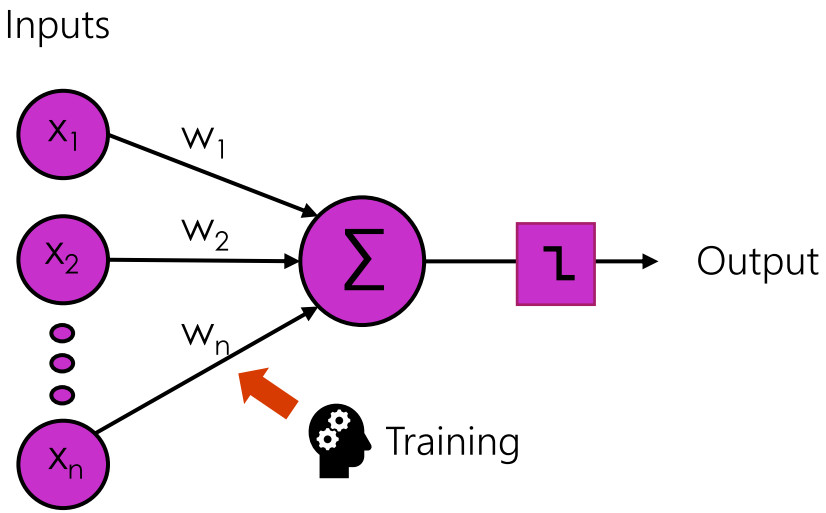


Image: Jeff W. Lichtman and Joshua R. Sanes, CC BY 3.0
https://commons.wikimedia.org/wiki/File:Brainbow_(Lichtman_2008).jpg

Perceptron (single layer neural network)



Modelled on biological neurons. Learning algorithms, e.g. back-propagation of error-function.

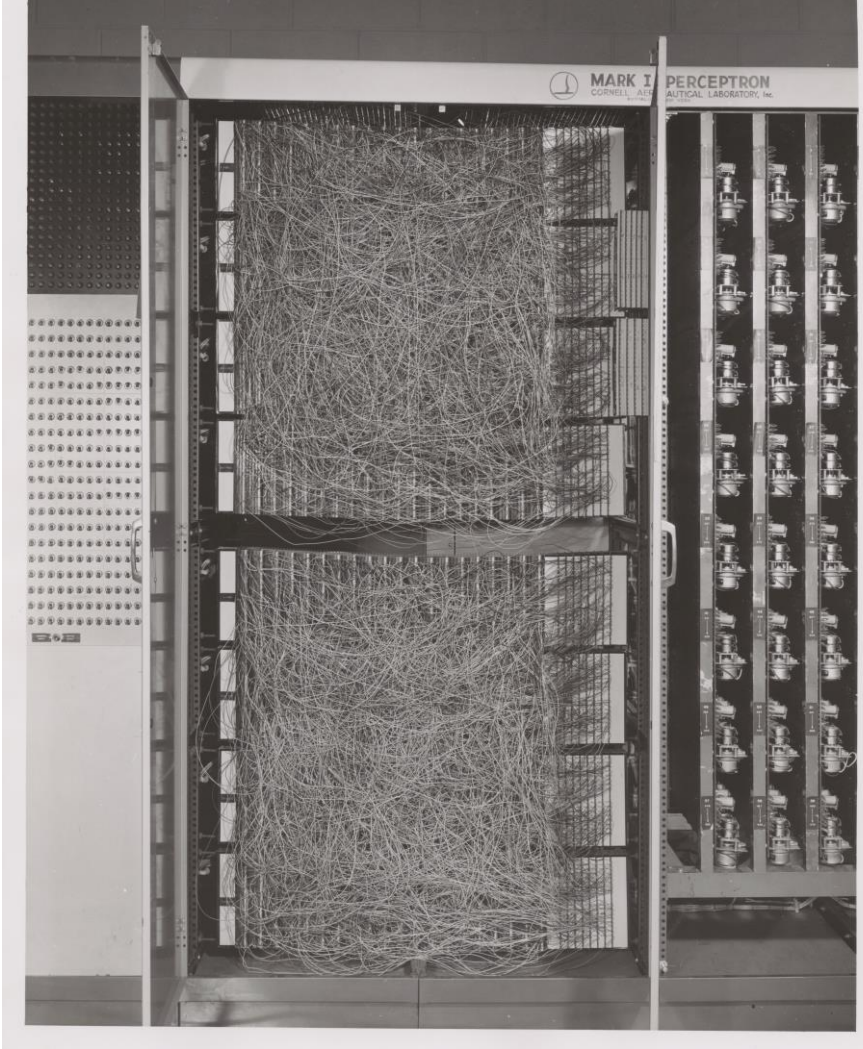
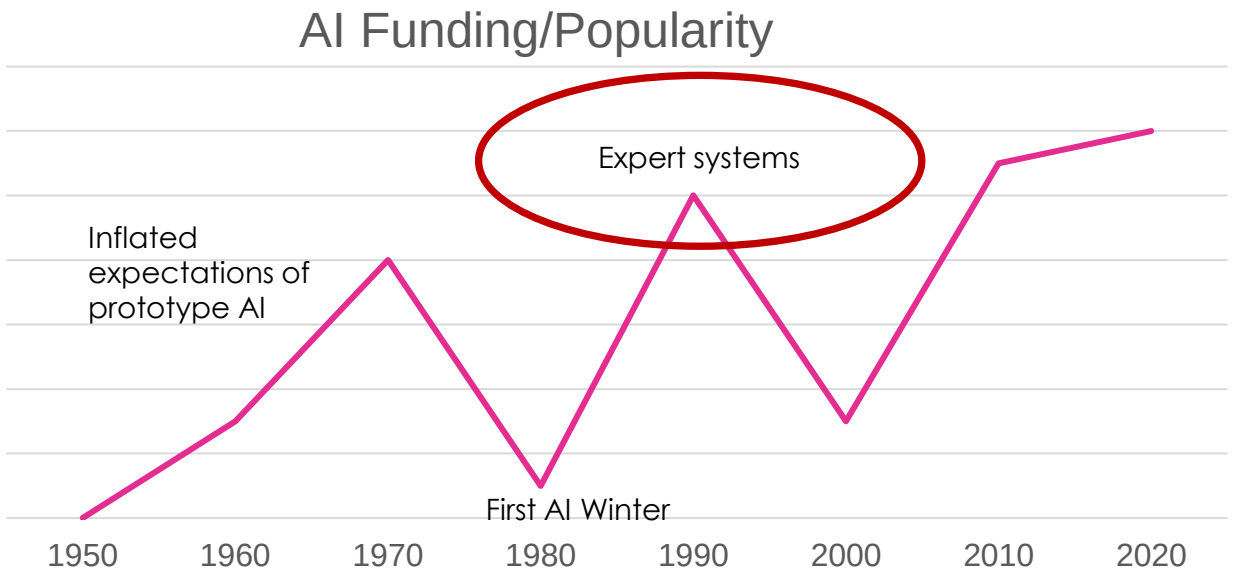


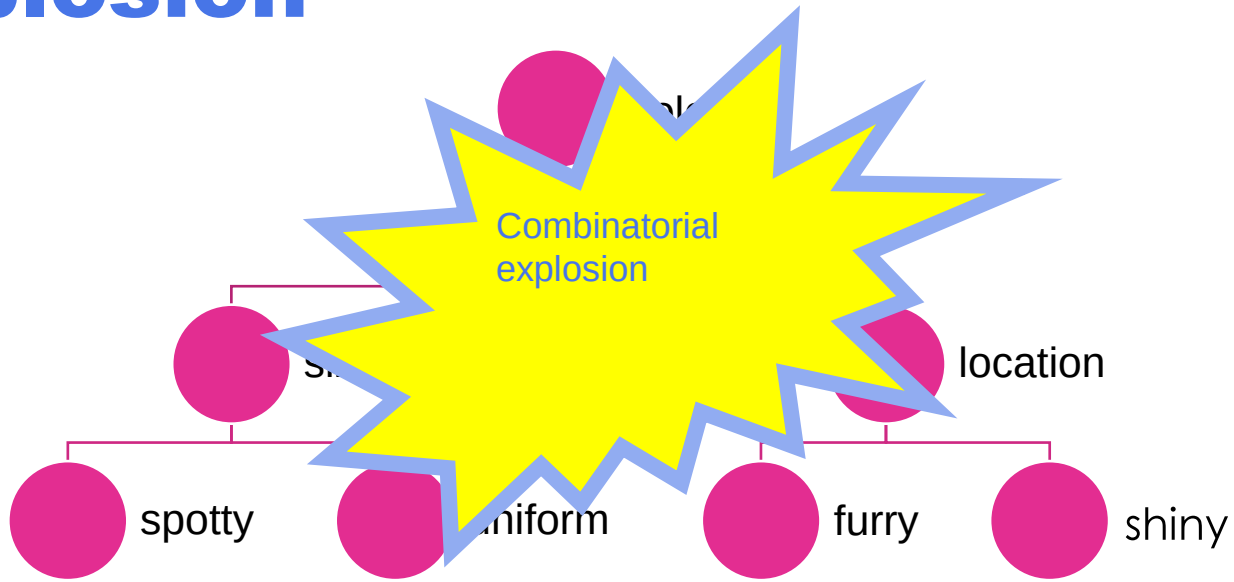
Photo: Perceptron, Cornell University, used with permission

AI – it's the 'Next Big Thing'...

...and has been for the last 60 years, on and off



Decision Trees – Combinatorial Explosion



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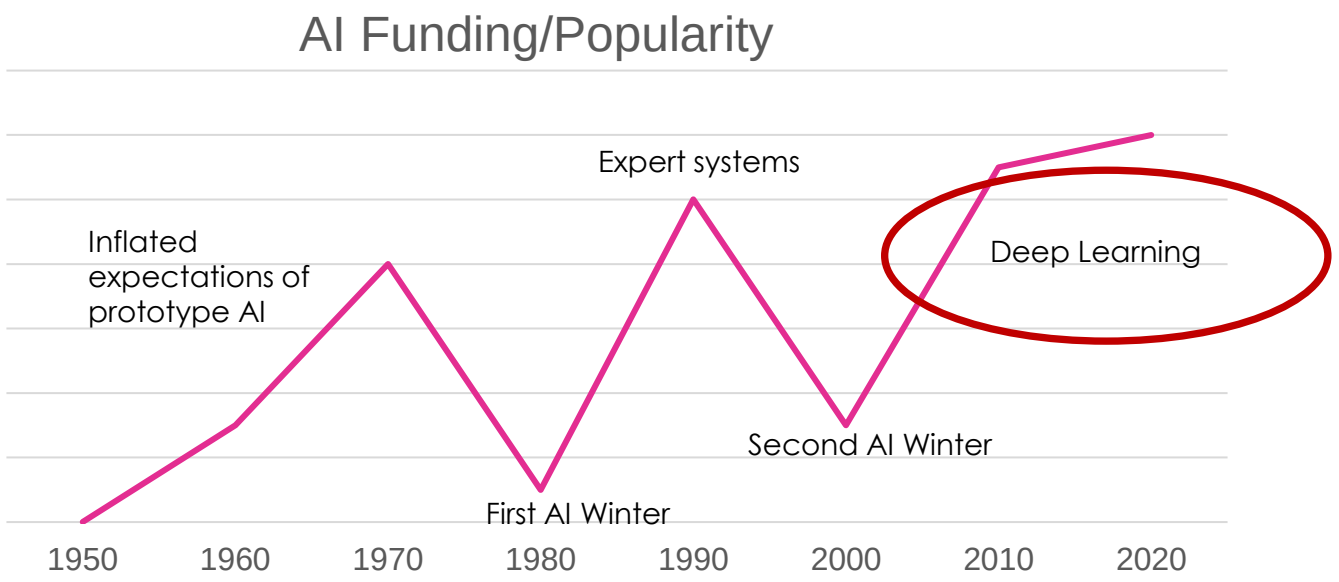
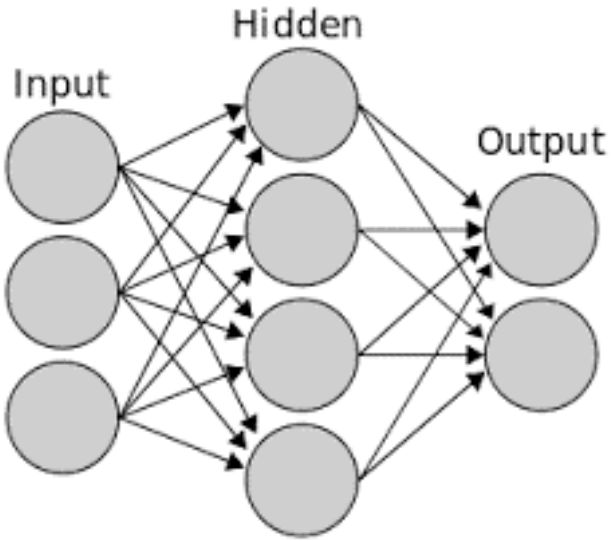
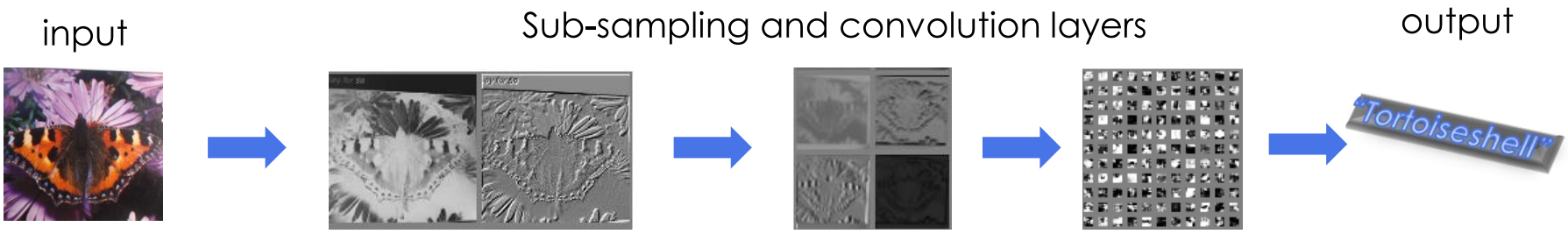


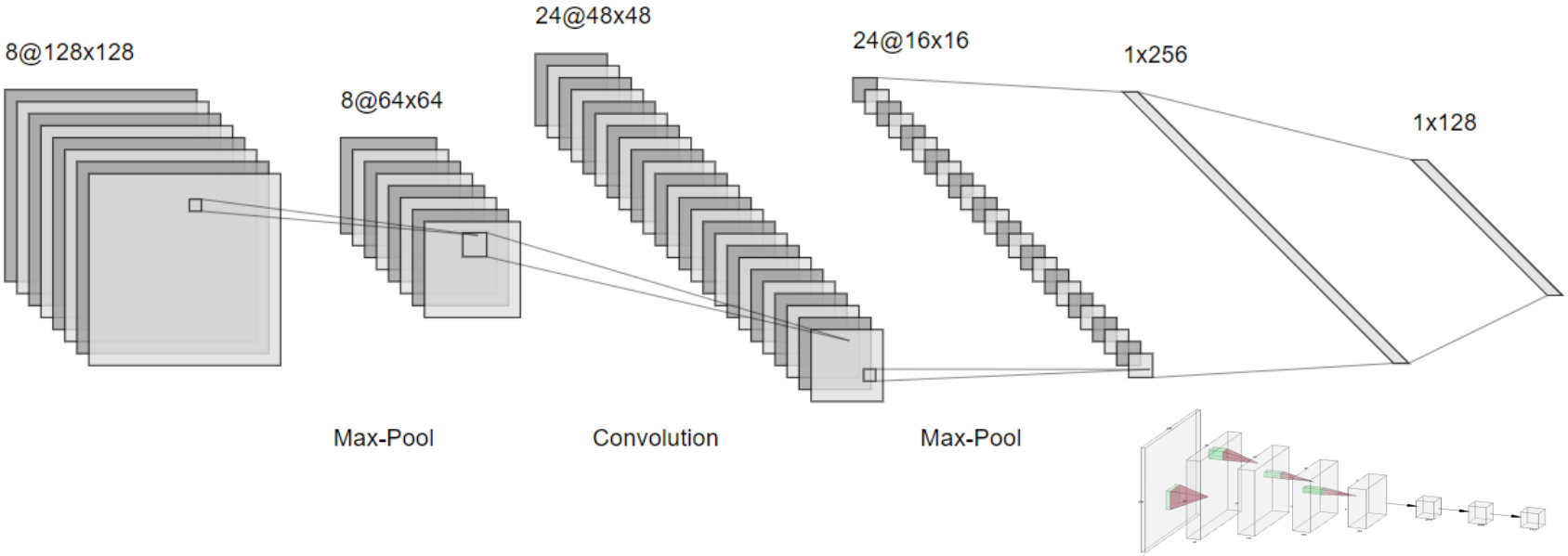
Multilayer Neural Network



Overcome limitations of single-layer network by multilayer – current state-of-the-art ML typically uses 50+ layers.

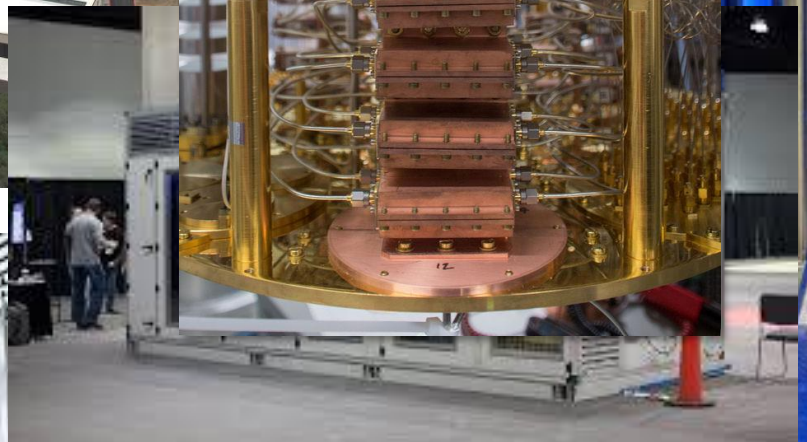
Deep Neural Networks



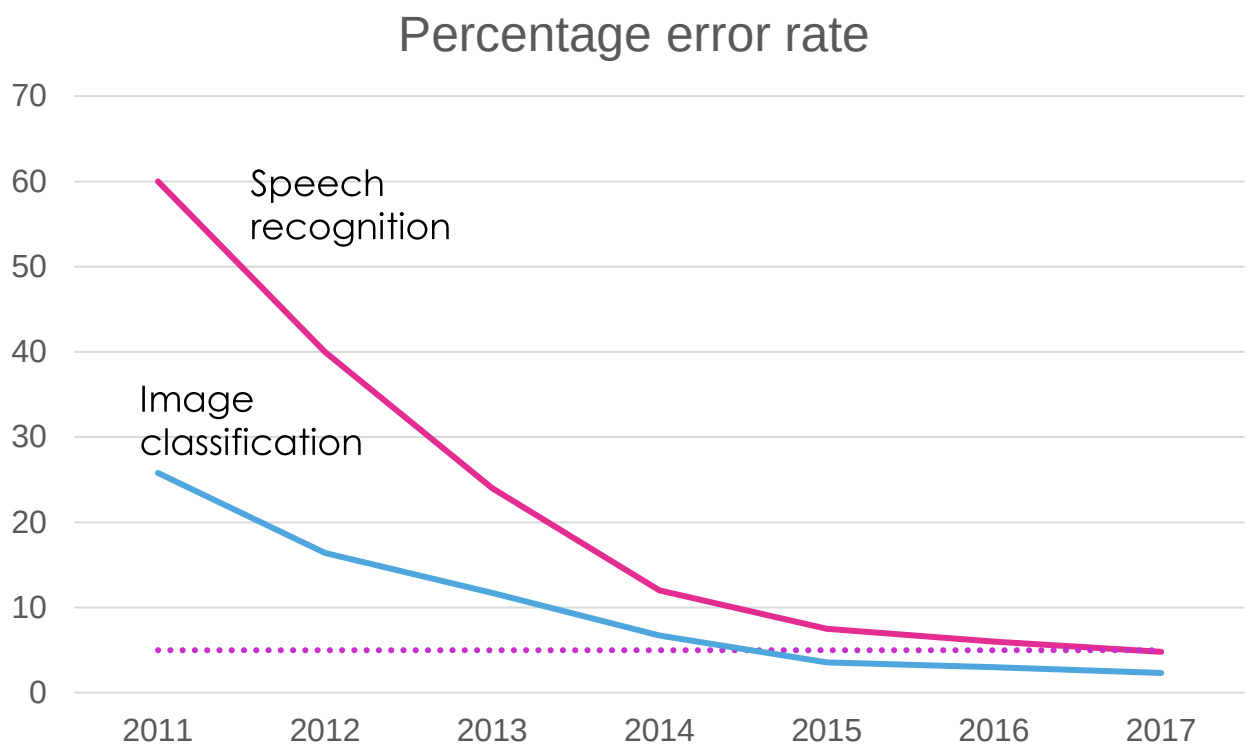


Graphic generated using http://alexlenail.me/NN-SVG/LeNet.html

What Changed?



Machine Learning is improving



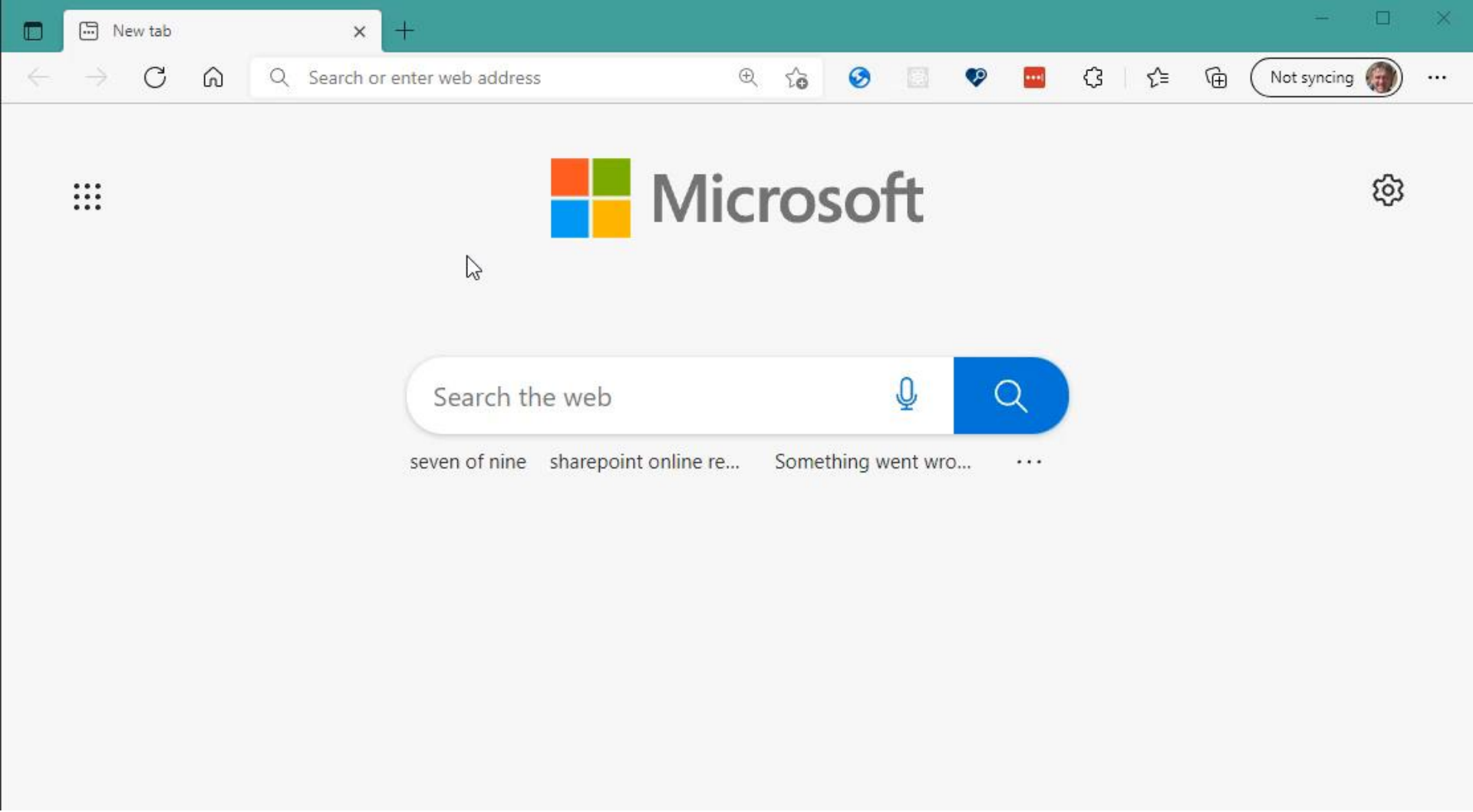
Sources: ImageNet Large Scale Visual Recognition Challenge and Google Machine Learning

Azure Cognitive Services

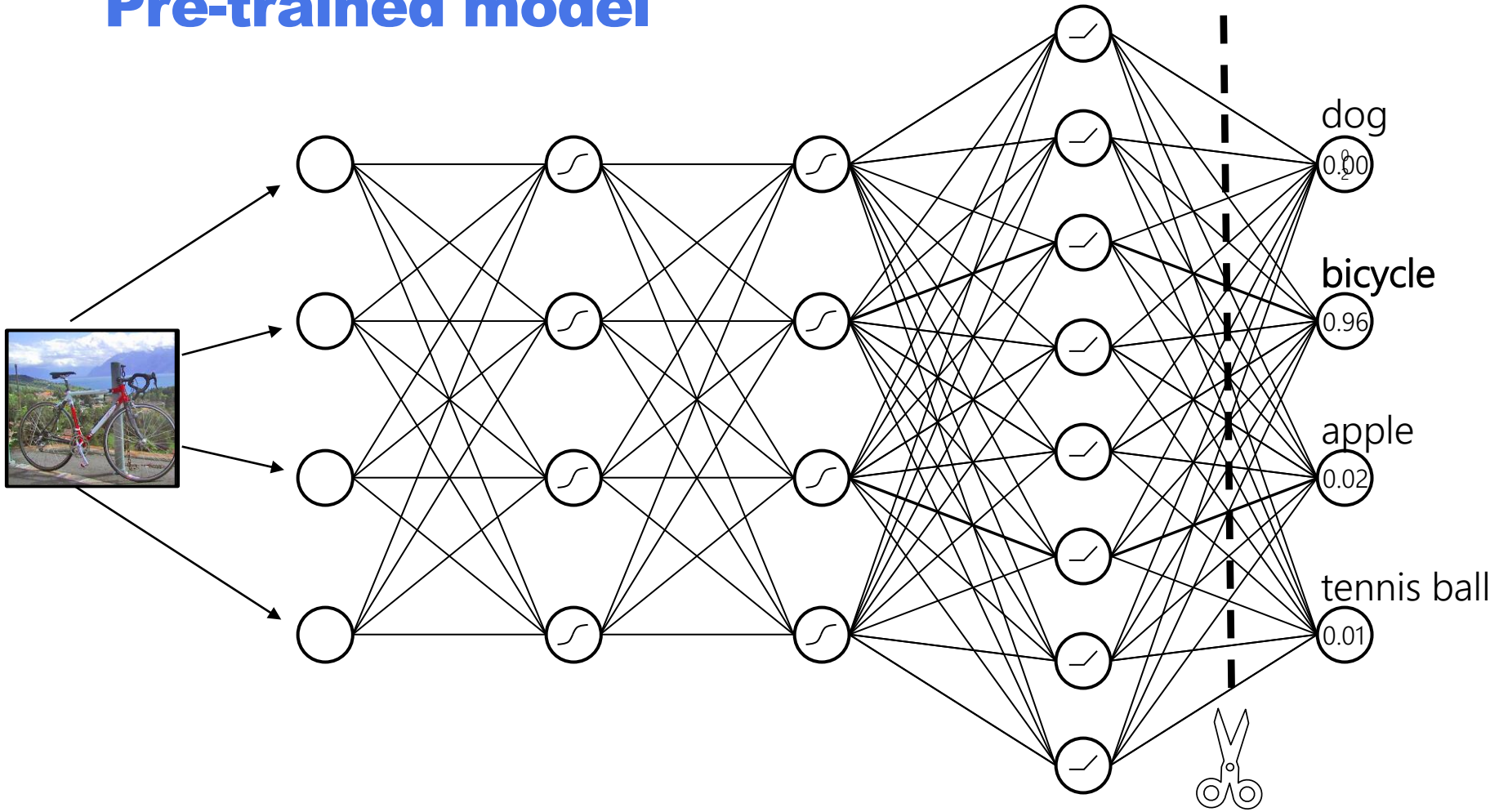
- Suite of Machine Learning models hosted as a service
- No need to develop your own Machine Learning models
- Ready-to-go AI for
  - Vision
  - Speech
  - Language
  - Knowledge
  - Search
- Models developed for you by Microsoft Research
- Mostly pre-trained, also some ‘custom’ models that you train

Cognitive Services – Computer Vision

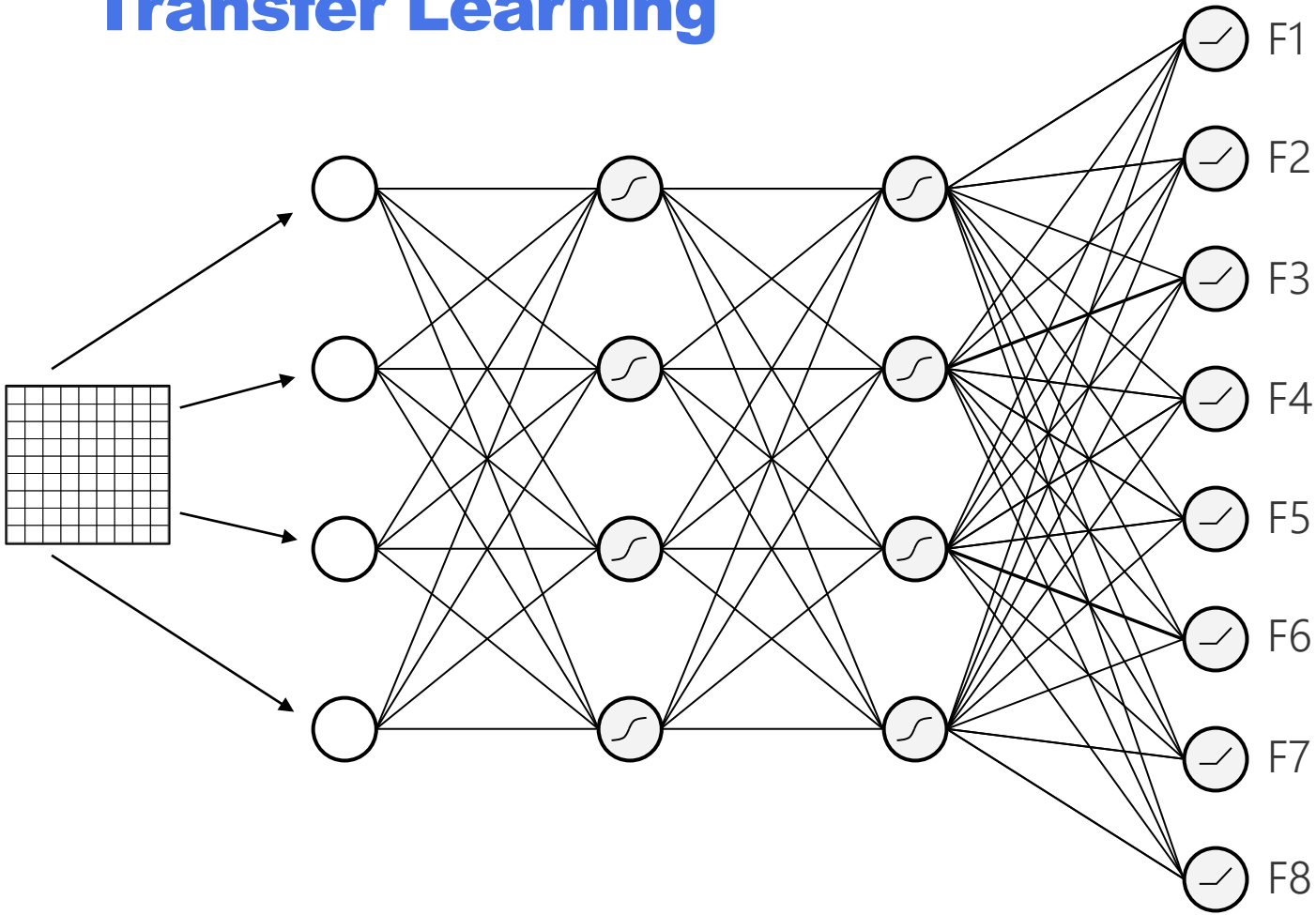
https://azure.microsoft.com/en-gb/services/cognitive-services/computer-vision/


New tab
Search or enter web address
Not syncing
Microsoft
Search the web
seven of nine
sharepoint online re...
Something went wro...

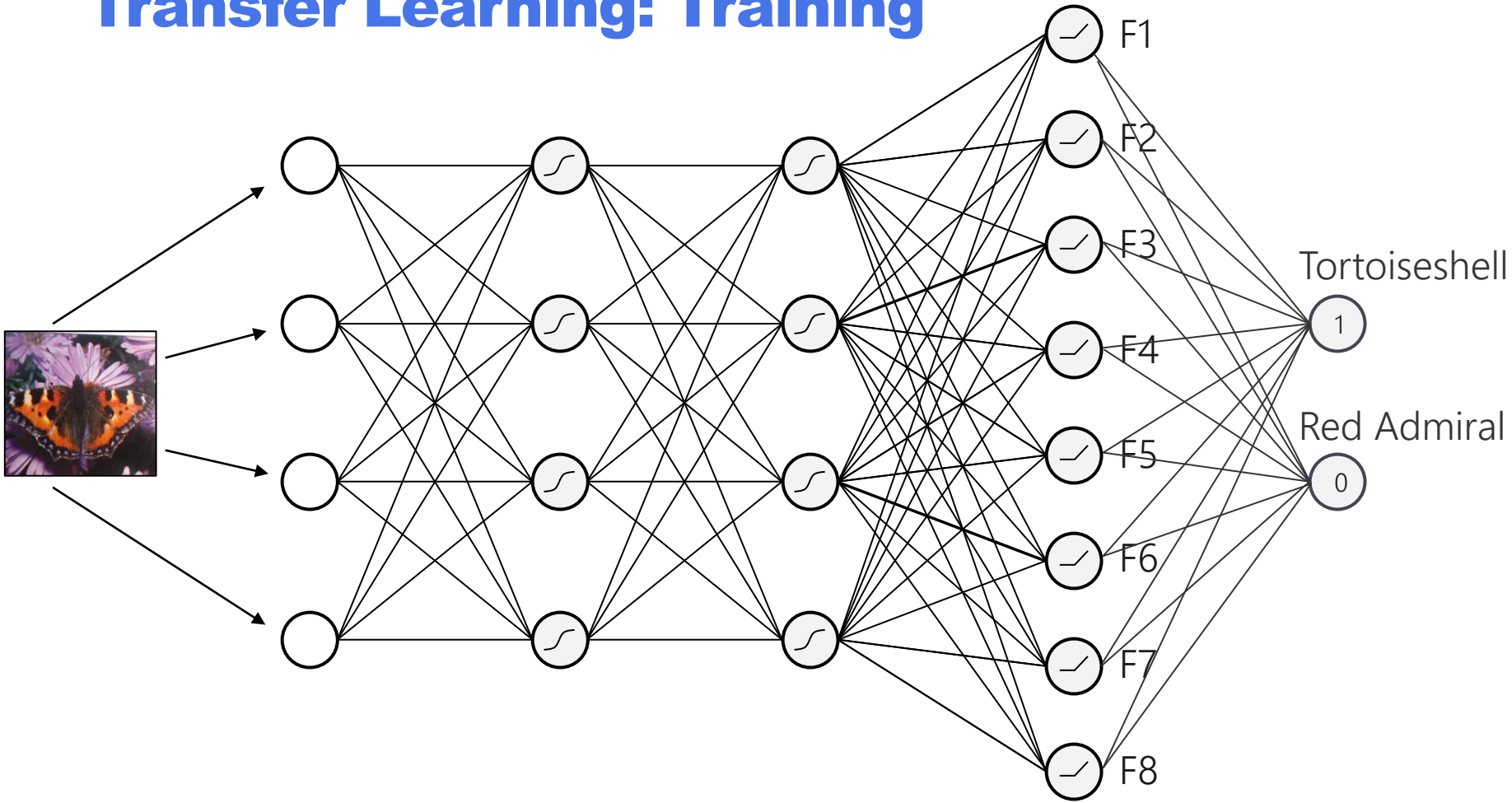
Pre-trained model



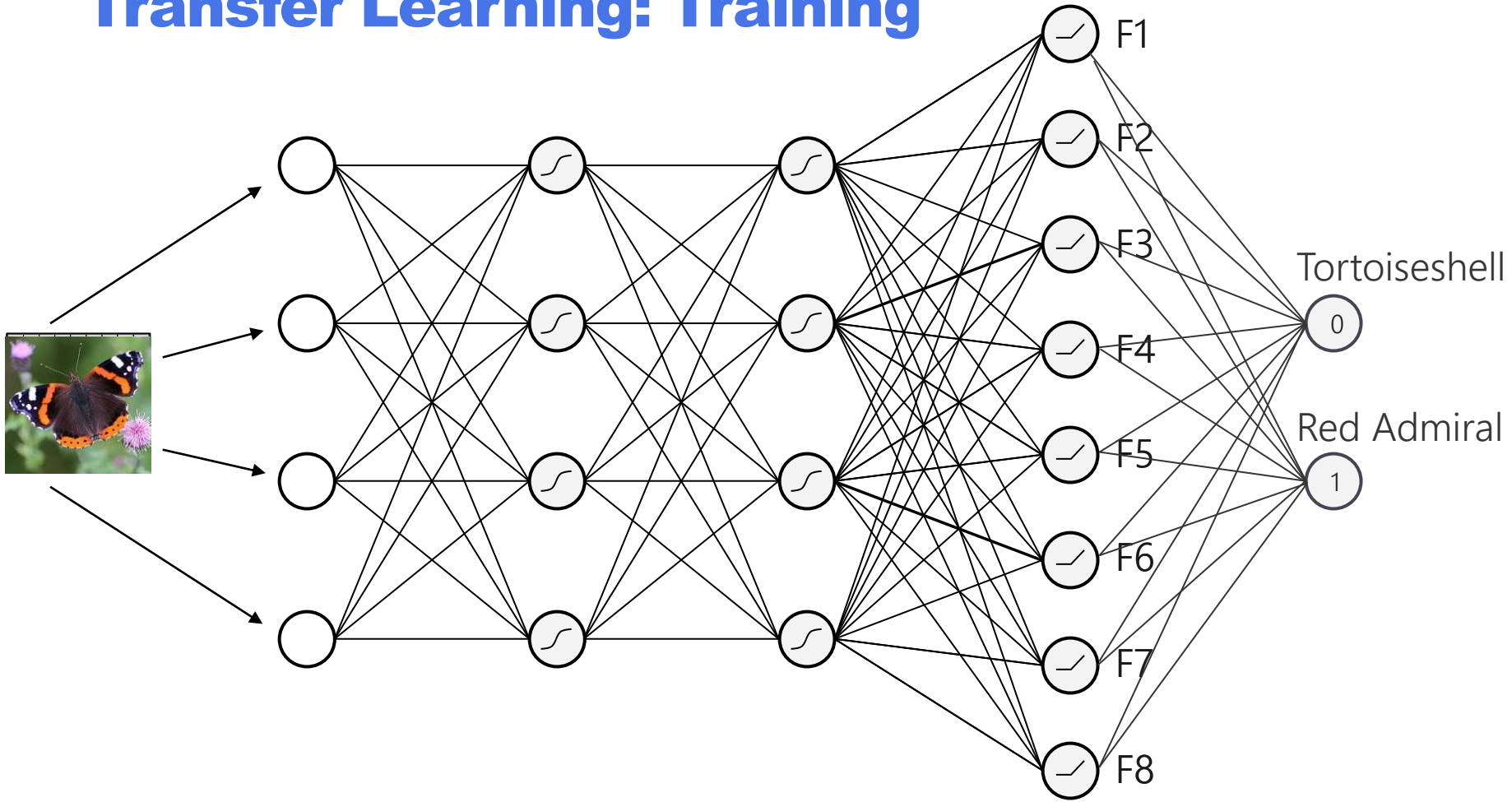
Transfer Learning



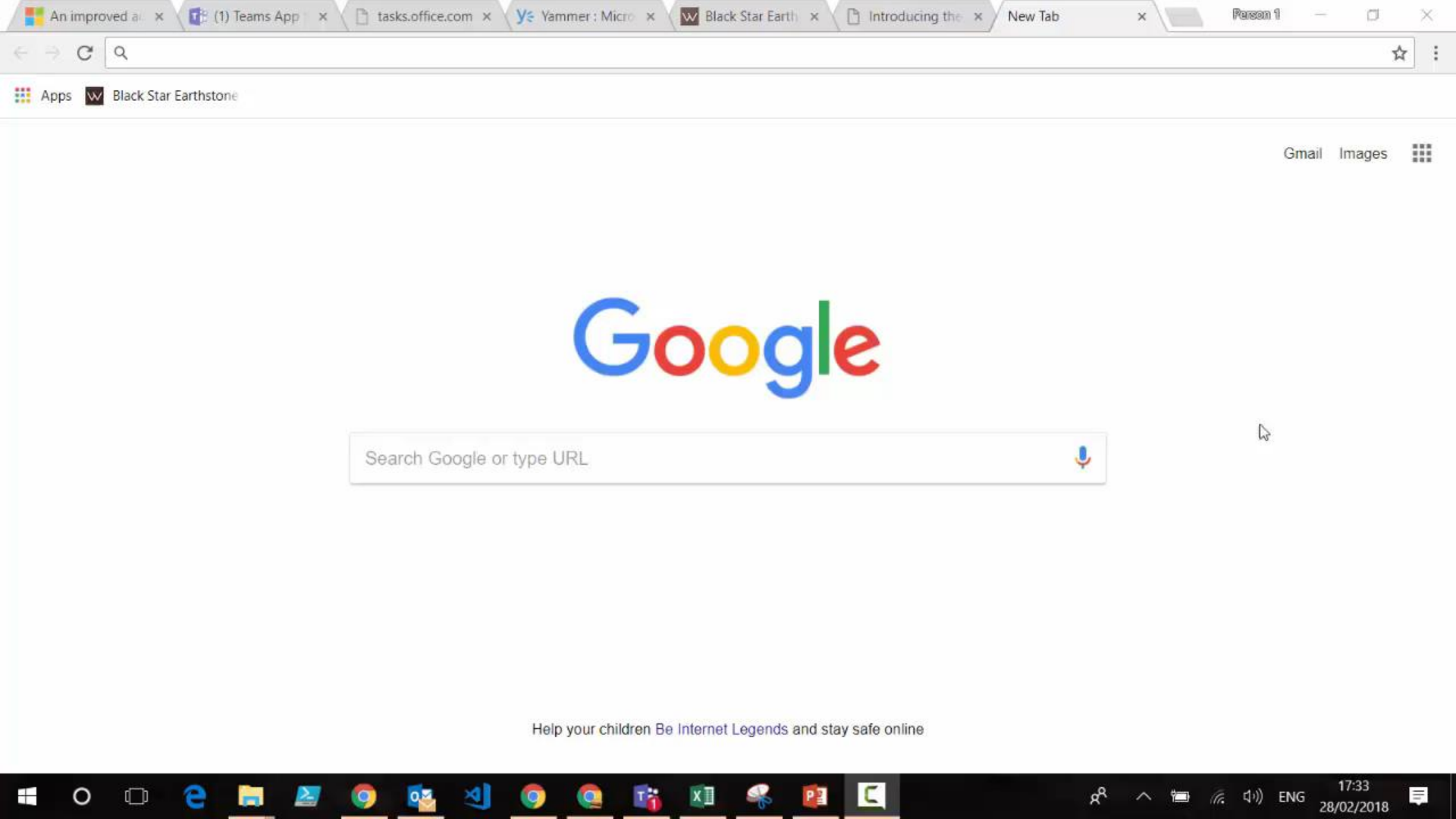
Transfer Learning: Training



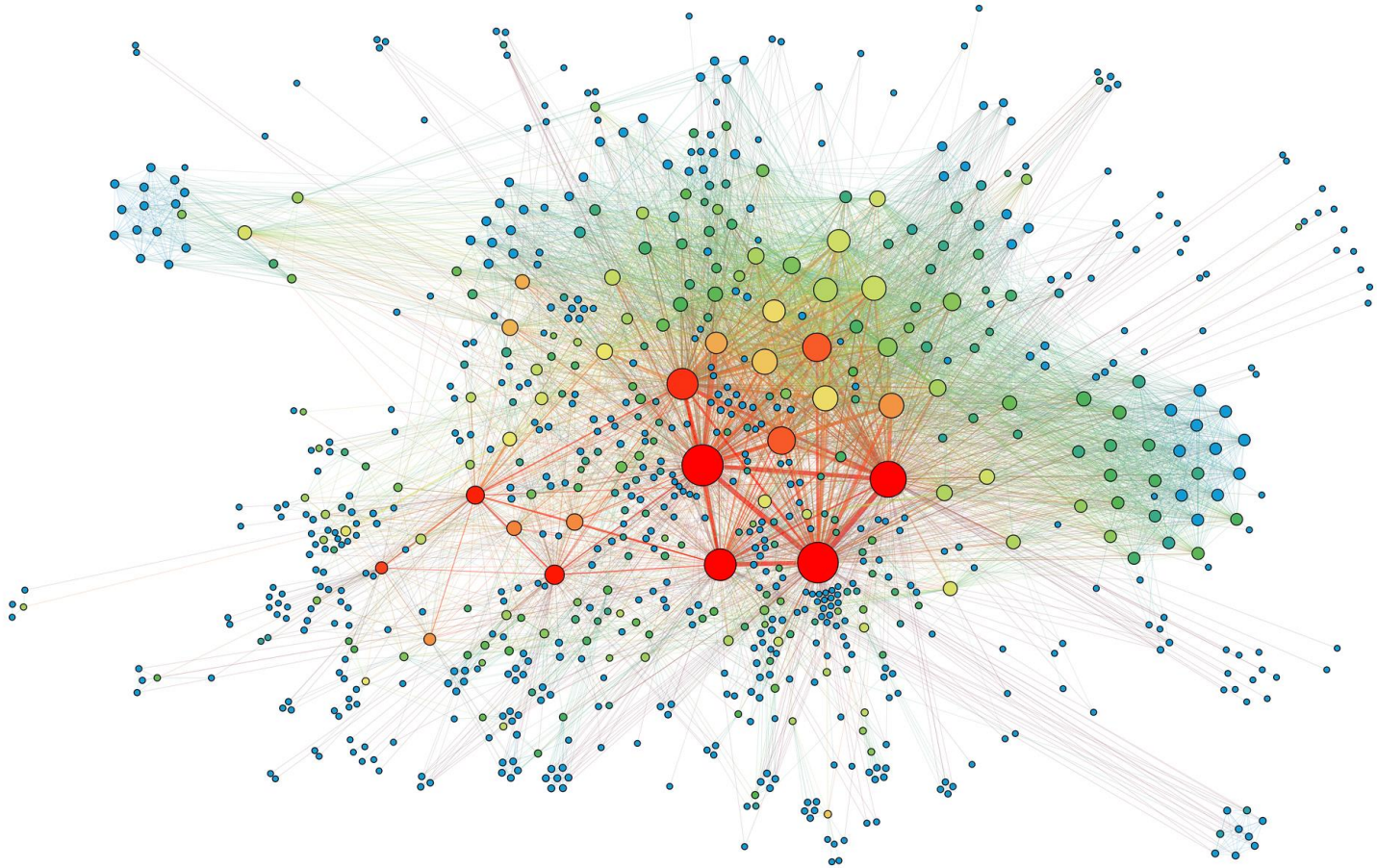
Transfer Learning: Training



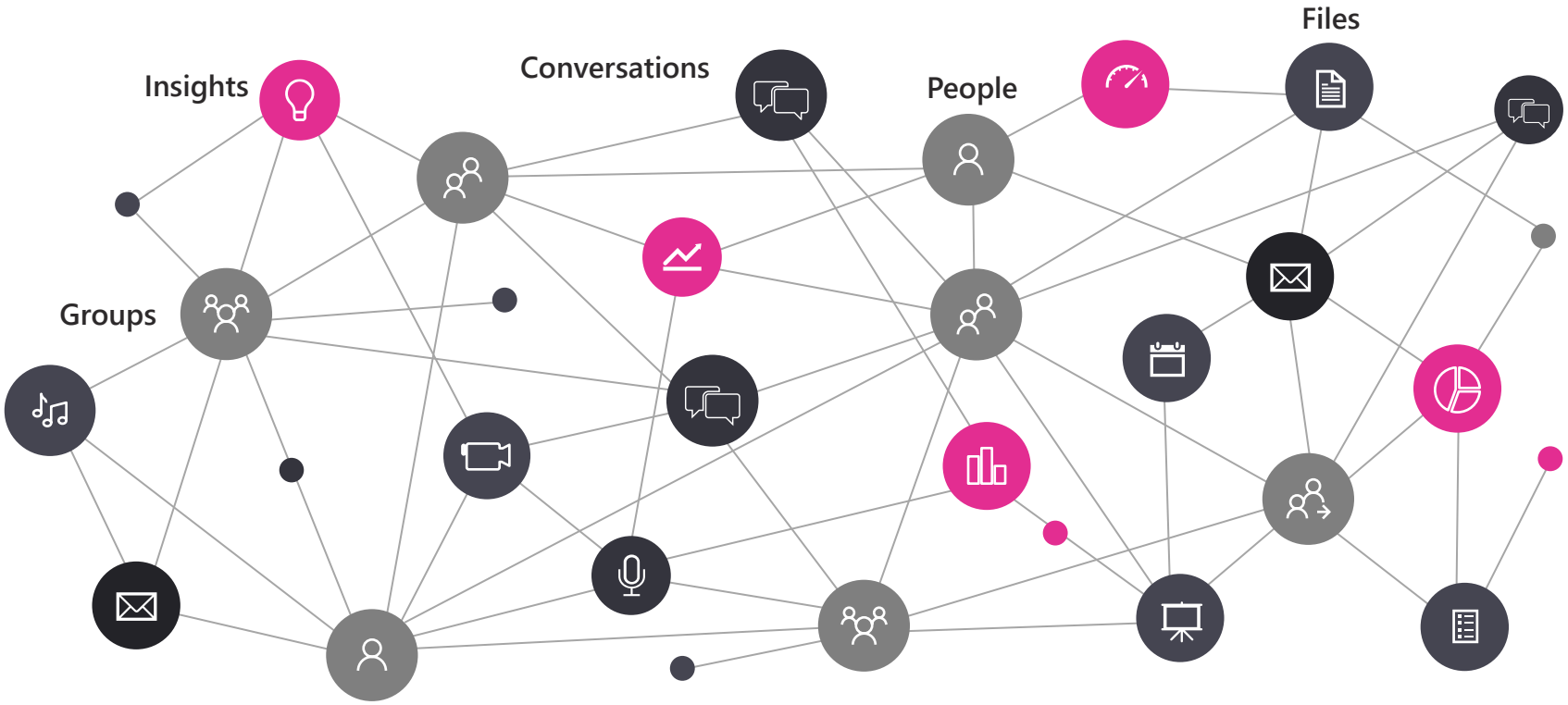

Demo:
Cognitive Services
Custom Vision
http://customvision.ai/


An improved a
(1) Teams App
tasks.office.com
Yammer : Micro
Black Star Earth
Introducing the
New Tab
Person 1
Apps
Black Star Earthstone
Gmail
Images
Google
Search Google or type URL
Help your children Be Internet Legends and stay safe online
ENG
17:33
28/02/2018

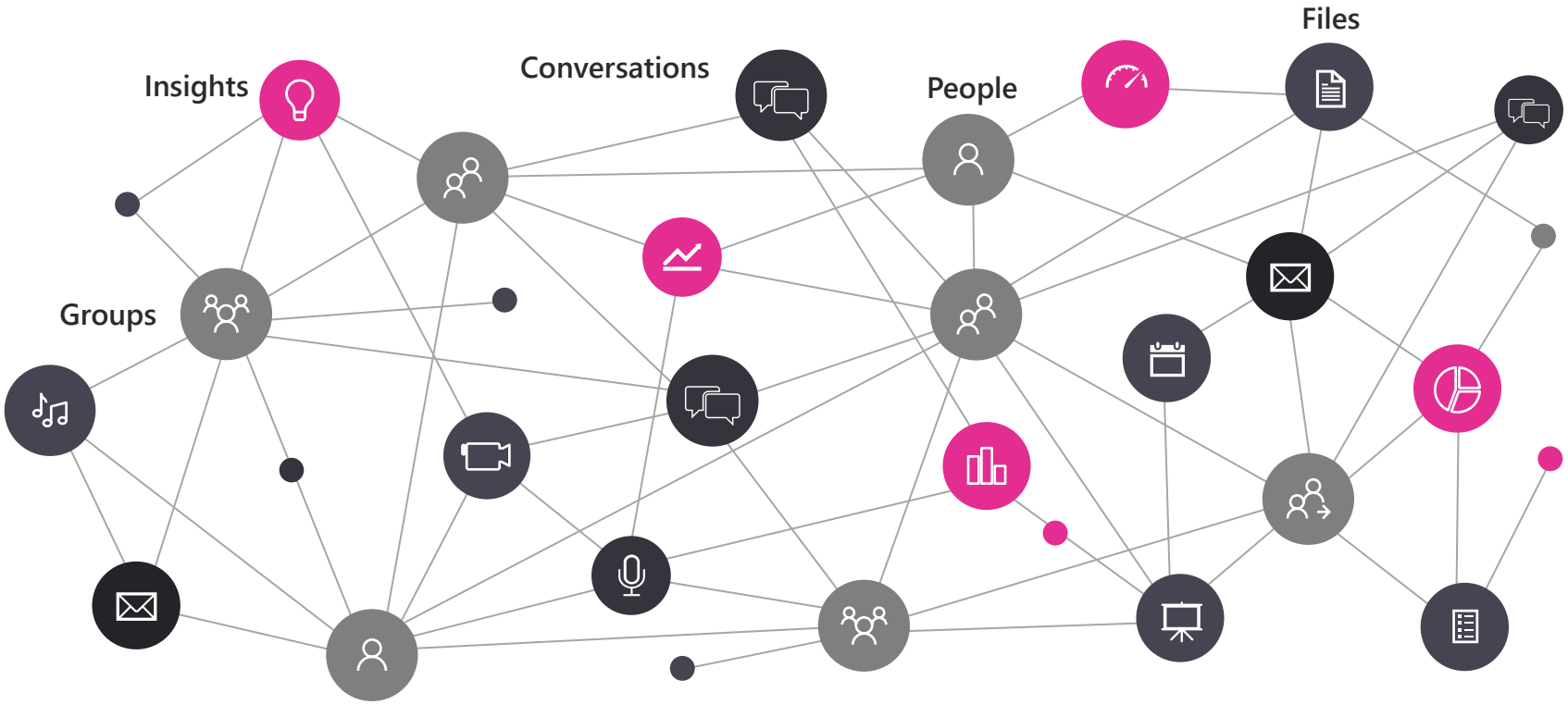
What is a Graph?



Microsoft Graph



Microsoft Graph



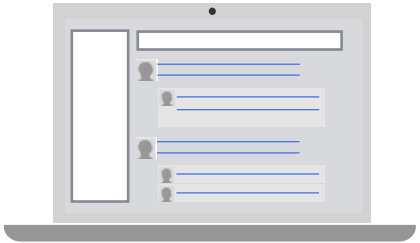
Office 365 Platform

Extensions

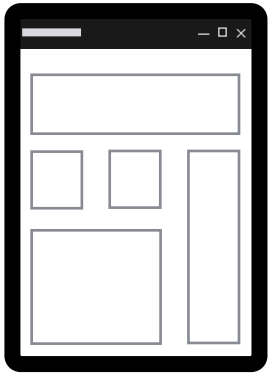
Office Canvases

Documents

Conversations

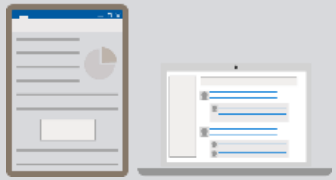


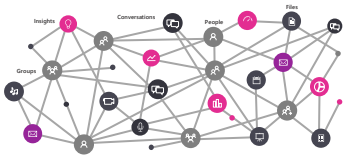
Pages



Standalone web, device, and service apps

Embedded canvases





Microsoft Graph

Insights

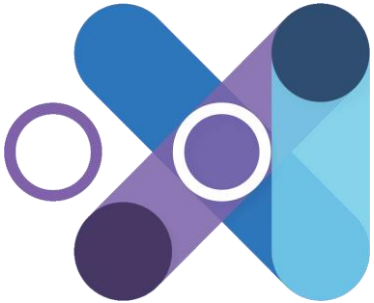
- What documents are most interesting to this person?
- What's the best time to meet for this group of people?
- Who should this person contact for info on this topic?
- What knowledge already exists in the organization on this topic?

- Build your own solutions (I'll show you how tomorrow), use third party solutions or take advantage of the built-in features of Microsoft 365

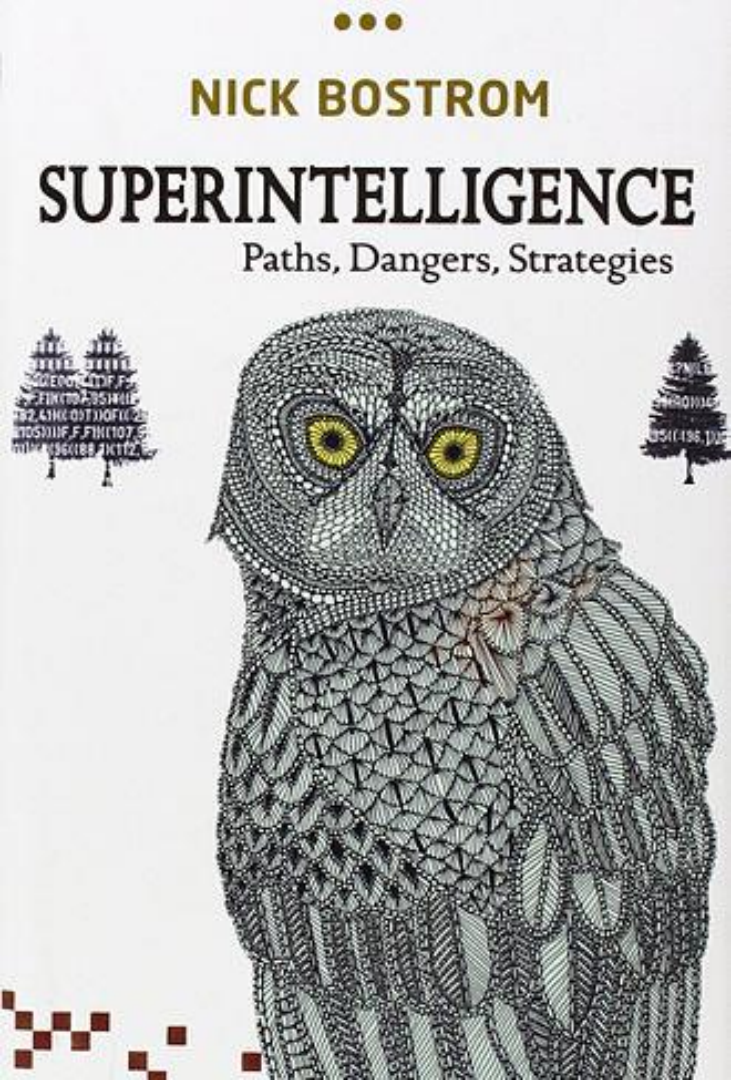
SharePoint Syntex

- Uses advanced AI and machine teaching to amplify human expertise, automate content processing, and transform content into knowledge.
- Form processing models using AI Builder help you capture information from structured content, like invoices.
- Document understanding models uses NLP to classify and capture information in unstructured content, e.g. from CVs (danger – see later).
- Training custom form models using AI Builder (Power Platform).
- Underlying technology is Project Cortex.

Viva Topics



- Viva Topics – engagement platform – example ‘I’ve just joined the team - what’s project meerkat?’ – creates content to get you up to speed.
- Organizing content and making connections.
- Automatically generates information mini-hubs across SharePoint and Teams.
- Underlying technology is Microsoft Graph.
- Topic centres, topic pages and topic cards.

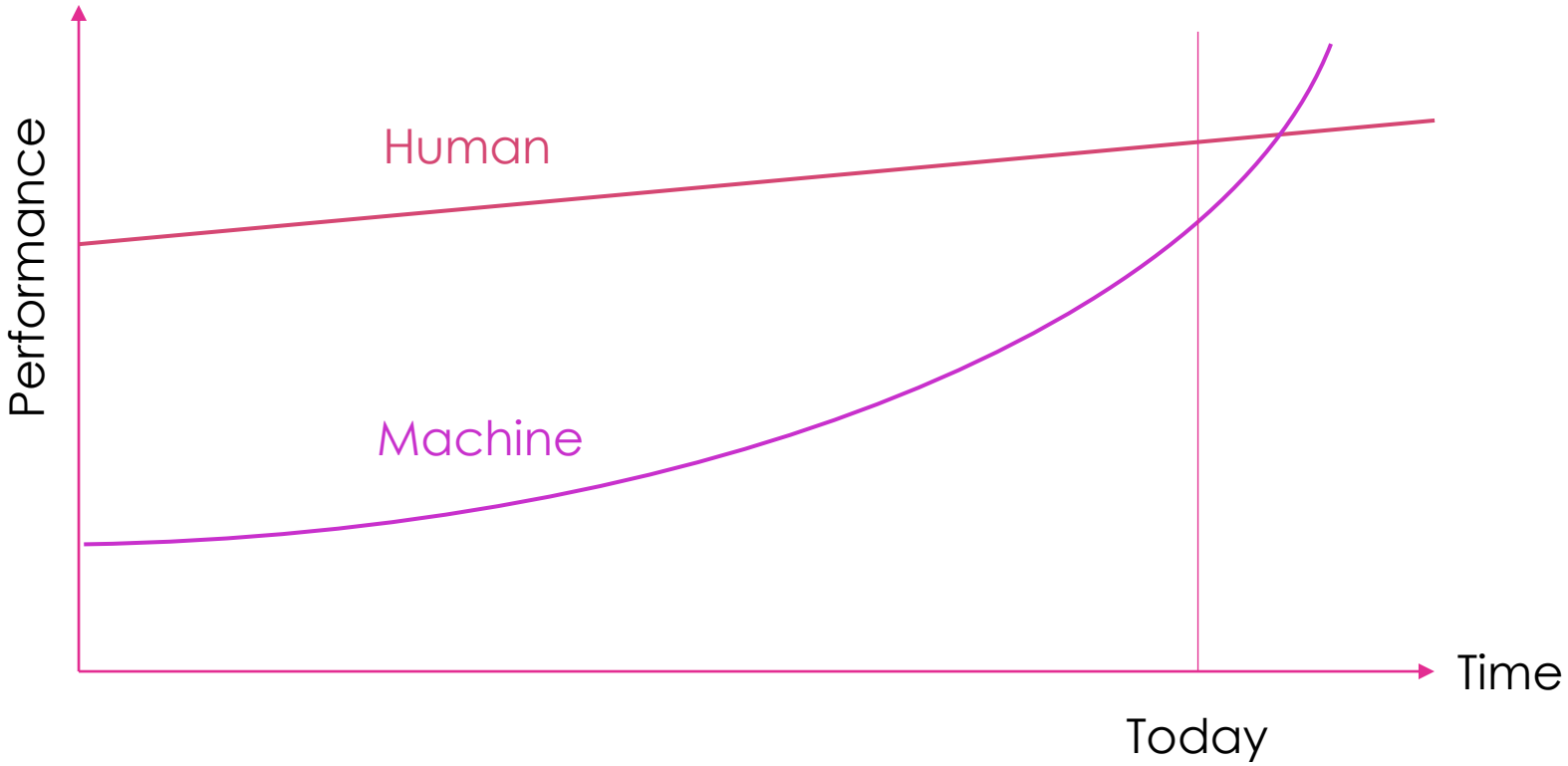


Where will it end?

Existential threat?

Ethical issues?

Machine vs. Human Learning




ctrl shift face

Ethical Issues

- Screening job candidates
- Assessing productivity
- Detecting crime
- Insurance premiums
- Healthcare
- Loss of Jobs

Responsible AI Principles : https://www.microsoft.com/en-gb/ai/responsible-ai

Obligatory Terminator Image

- AI is is already here and pervading everything
- You don't have to be an expert – you can use Cognitive Services and AI built in to Microsoft 365 now!
- Be aware of the risks, both ethical and existential