INTRO TO MACHINE LEARNING

Girl Develop It Boise
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HI! I AM MARIANNA

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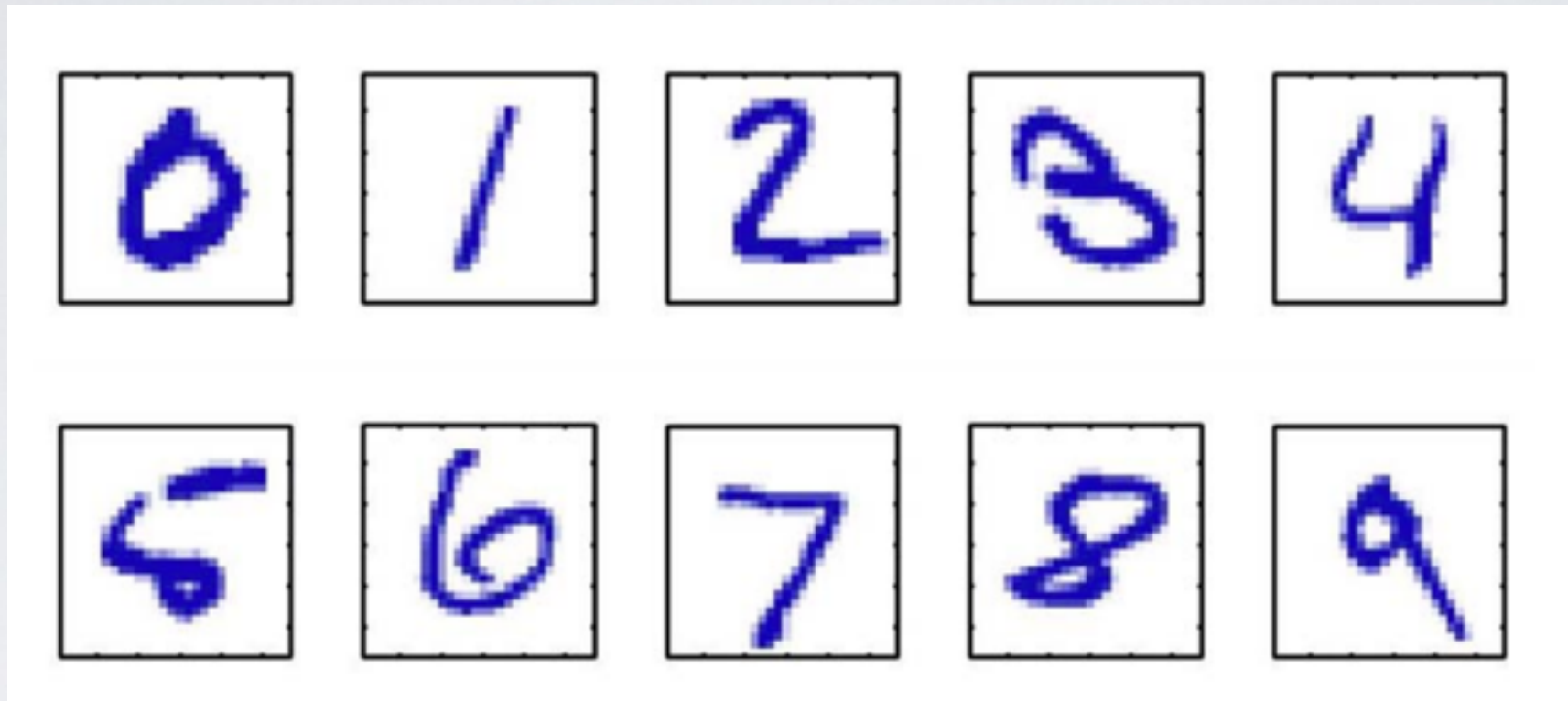- Software Engineer at Microsoft Tools for Software Engineers Team

@mariannabenz

WHAT IS MACHINE LEARNING?

- Algorithms that can improve their performance using training data

- Typically the algorithm has a (large) number of parameters whose values are learnt from the data

- Can be applied in situations where it is very challenging (= impossible) to define rules by hand, e.g.:

    - Face detection

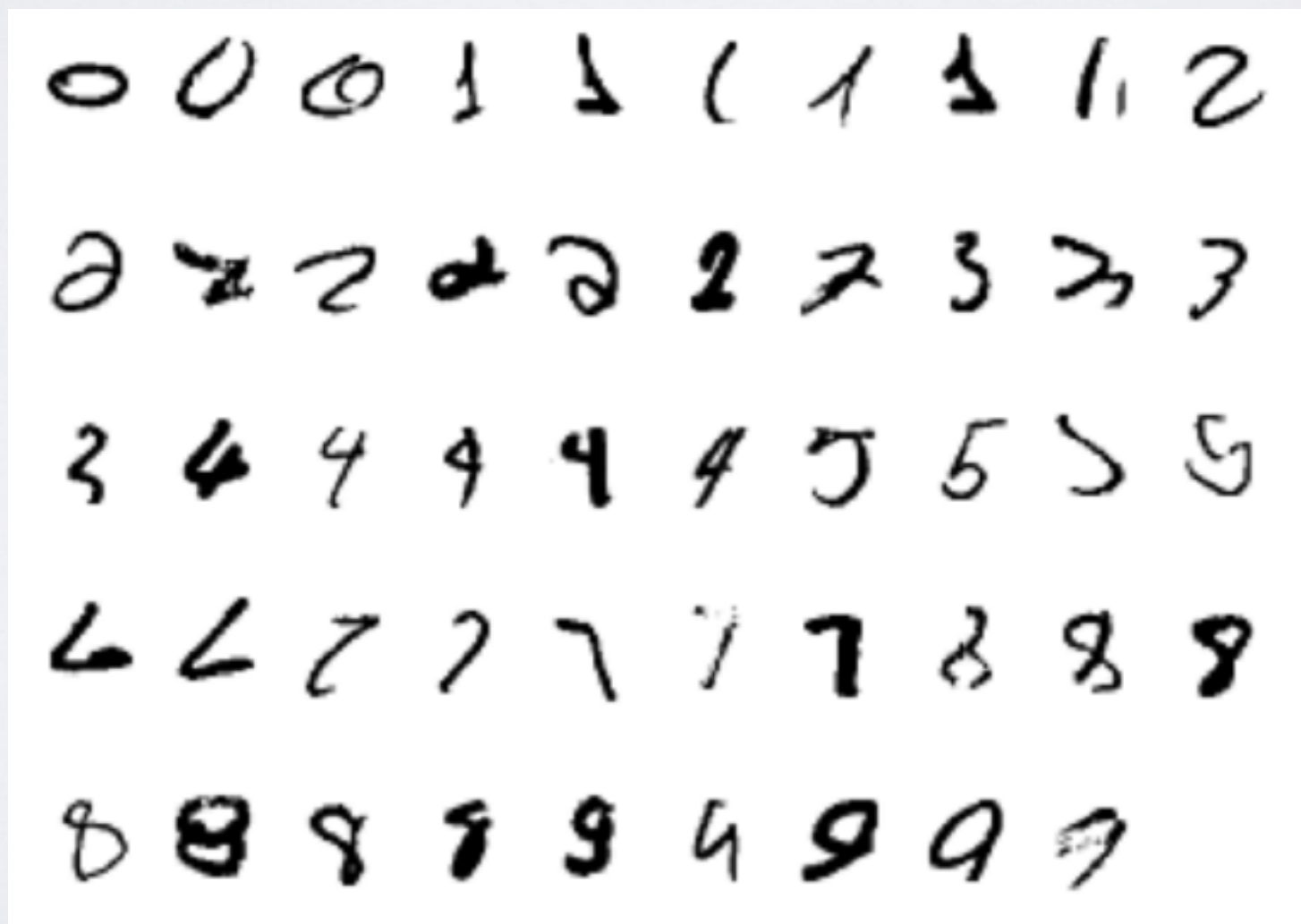   - Speech recognition

    - Stock prediction
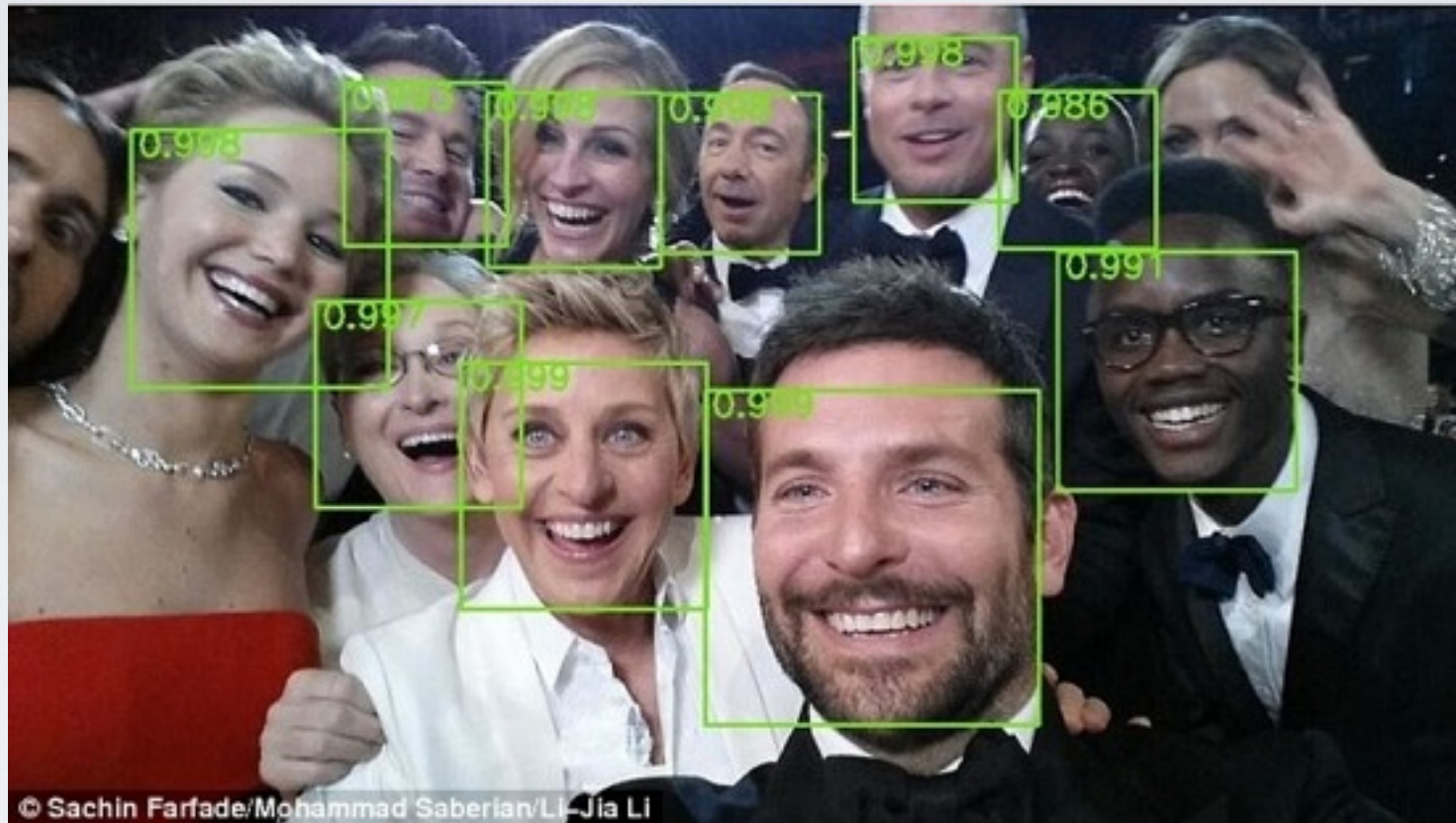
HAND-WRITTEN DIGIT RECOGNITION

- Images are 28 x 28 pixels

- Learn a classifier f(x) such that,

- f : x ➝ {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

HOW MANY IMAGES TO TRAIN?

- As a supervised classification problem

- Start with training data, e.g. 6000 examples of each digit
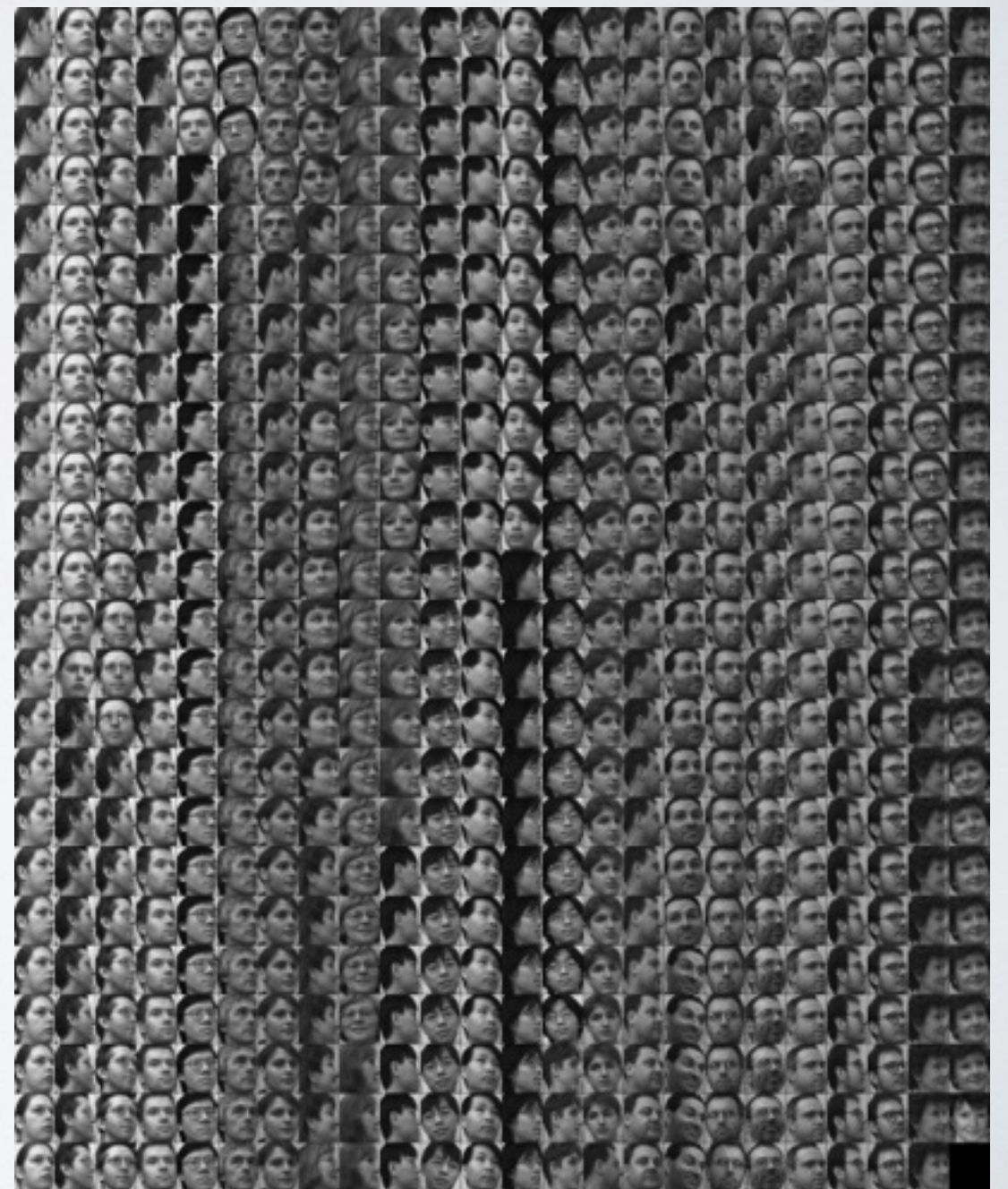
FACE DETECTION

Need to classify an image window into three classes:

- non-face

- frontal-face

- profile-face

CLASSIFIER IS LEARNT FROM LABELLED DATA

- Training data for frontal faces

  - 5000 faces

    - All near frontal

    - Age, race, gender, lighting

  - 10^8 non faces
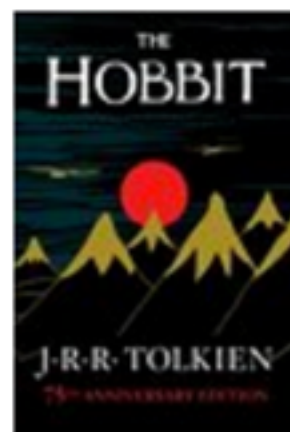
SPAM DETECTION

- This is a classification problem

- Task is to classify email into spam/non-spam

- Data is word count, e.g. of viagra, outperform, "you may be surprised to be contacted" …

- Requires a learning system as "enemy" keeps innovating
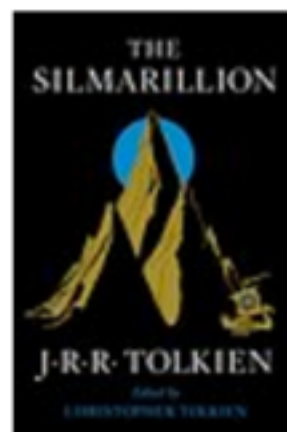
RECOMMENDATION SYSTEMS

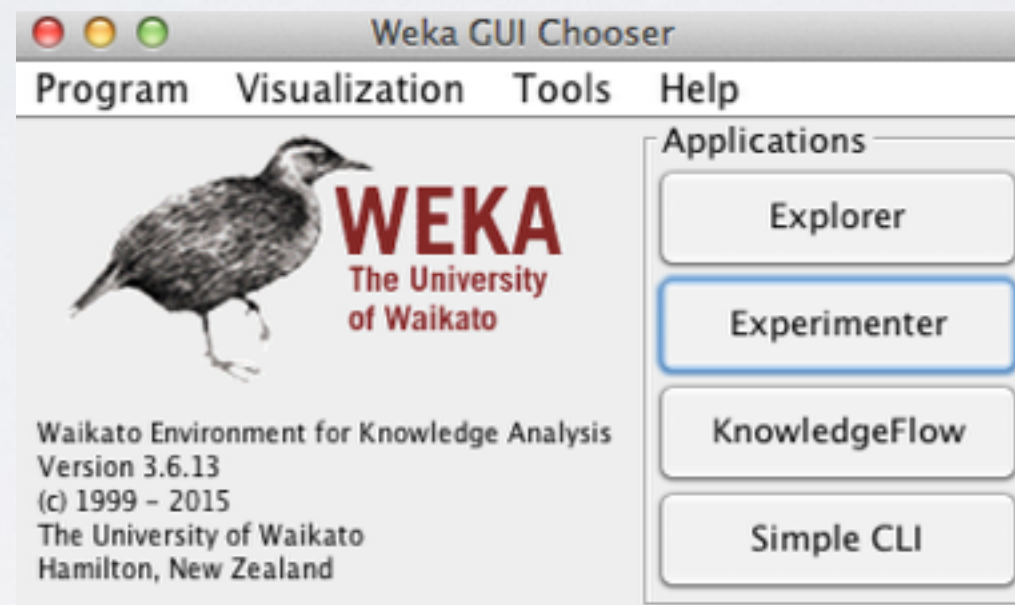**Frequently Bought Together**

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SUPERHERO GOOD VS EVIL DATASET

	sex	mask	cape	tie	ears	smokes	class
			training data				
batman	male	yes	yes	no	yes	no	Good
robin	male	yes	yes	no	no	no	Good
alfred	male	no	no	yes	no	no	Good
penguin	male	no	no	yes	no	yes	Bad
catwoman	female	yes	no	no	yes	no	Bad
joker	male	no	no	no	no	no	Bad
			test data				
batgirl	female	yes	yes	no	yes	no	??
riddler	male	yes	no	no	no	no	??

LET'S DEVELOP IT!

THANK YOU!