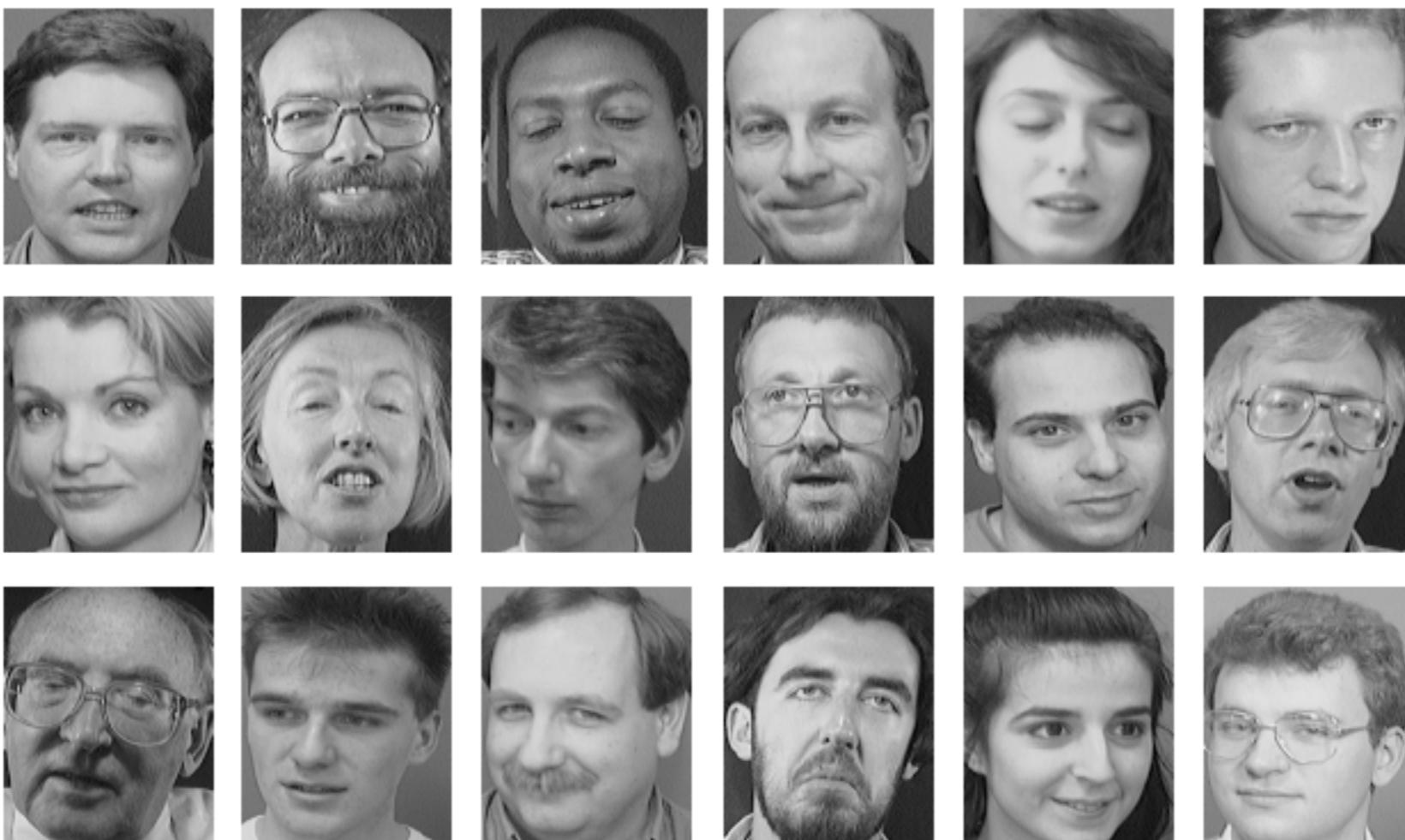


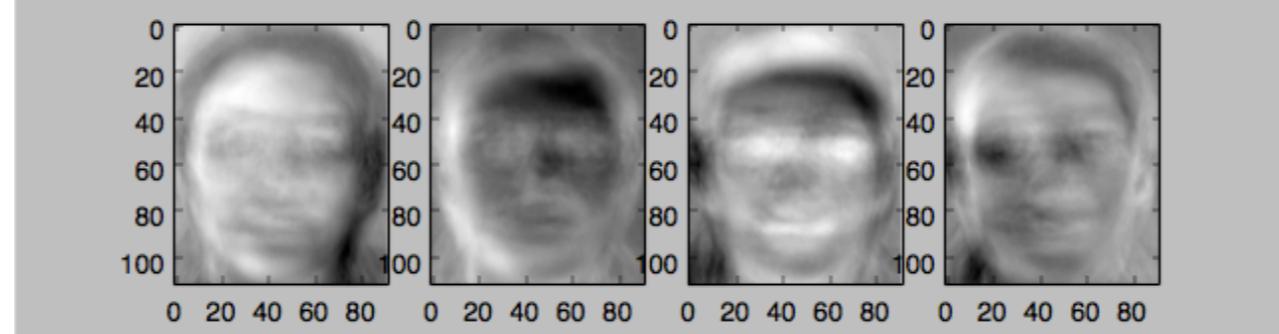
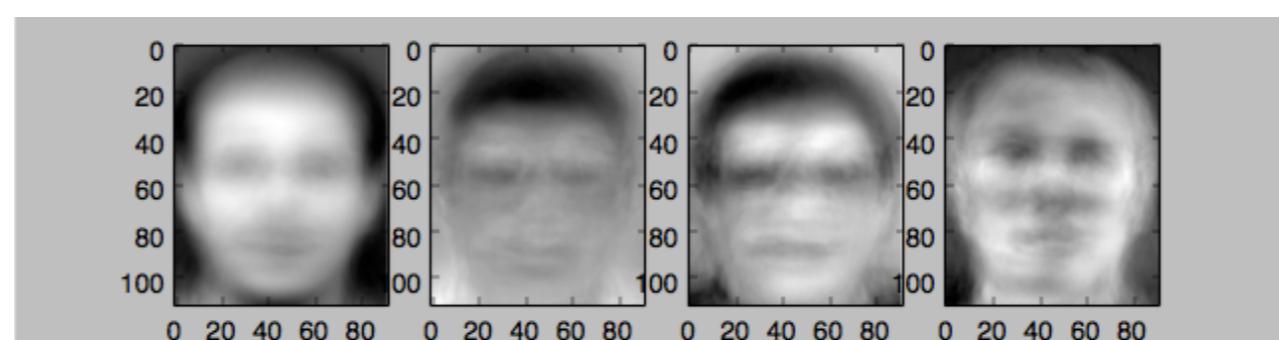
# **Review**

# Face Recognition

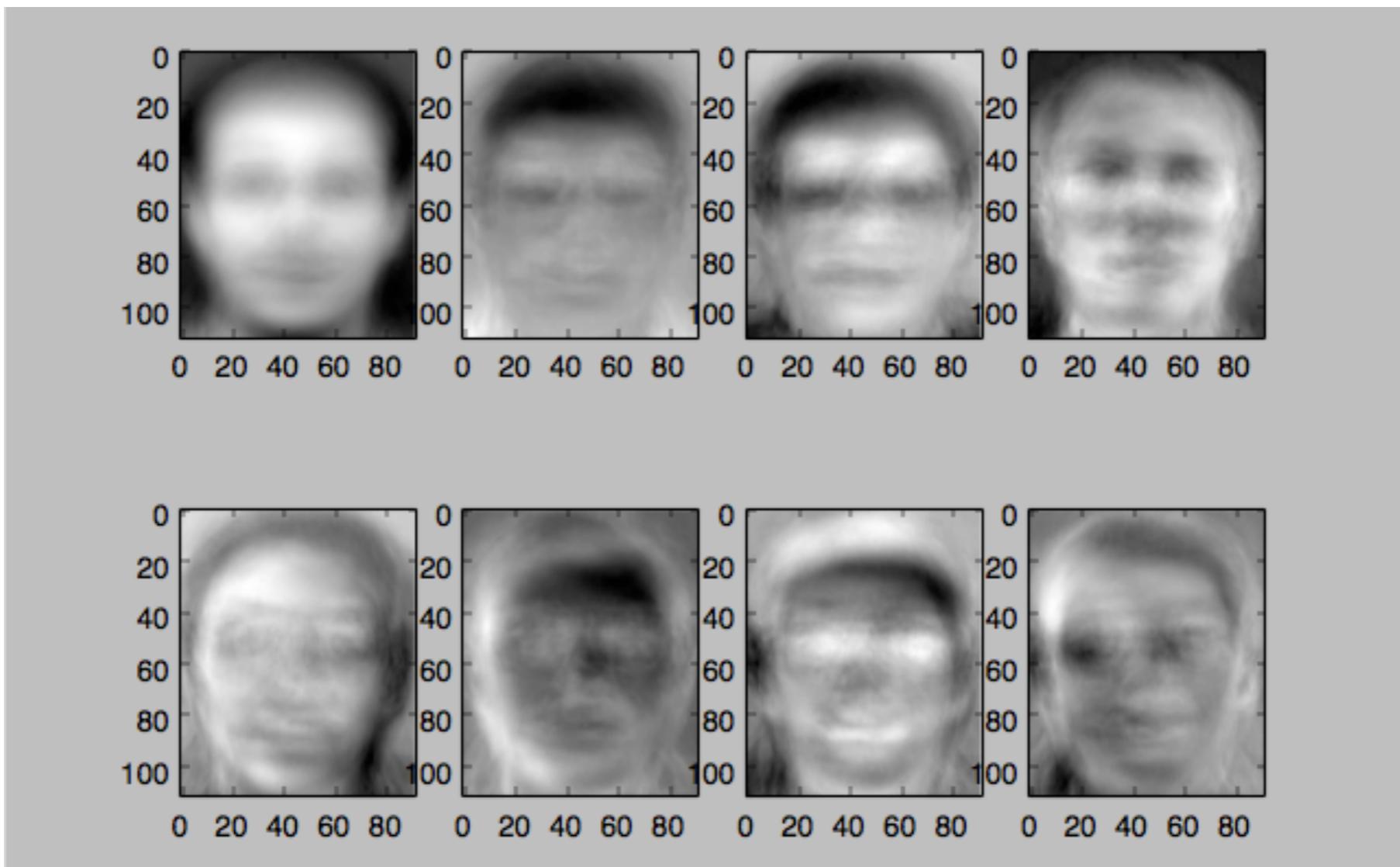


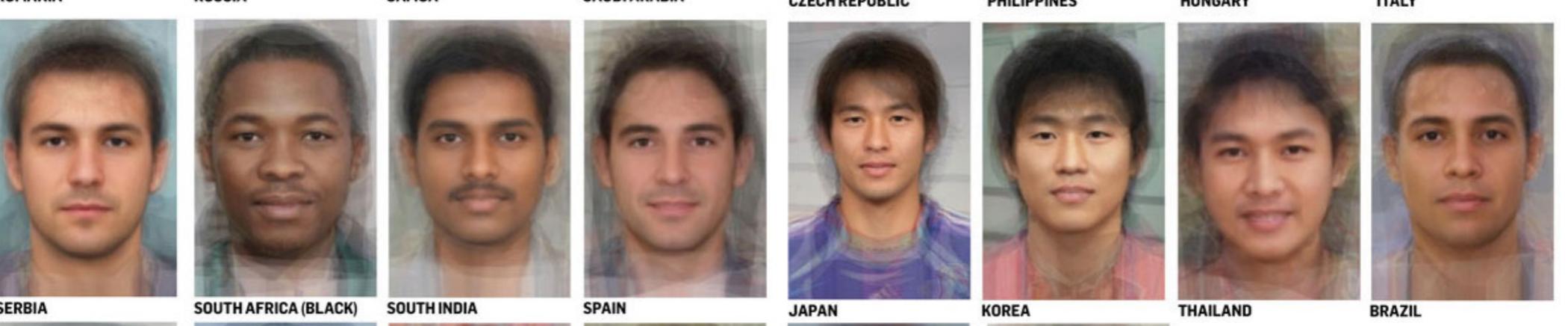
# Face Recognition



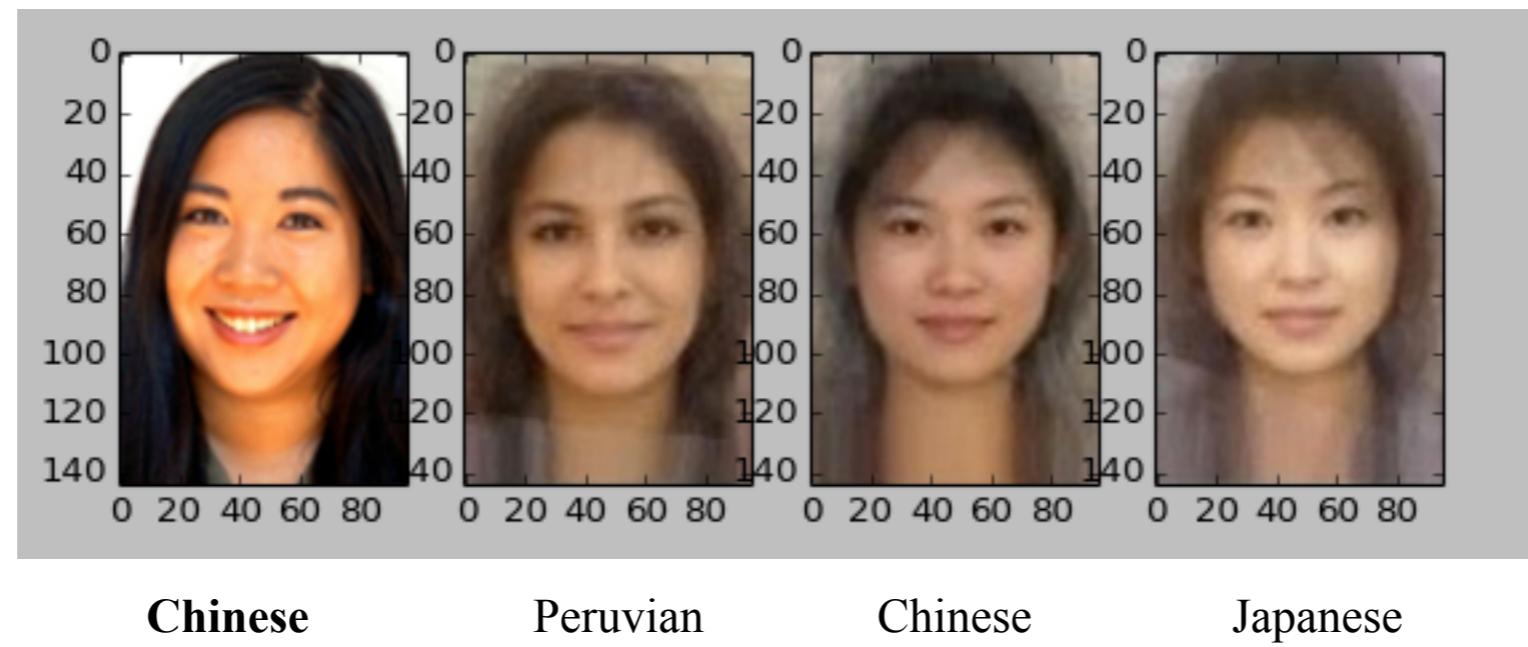
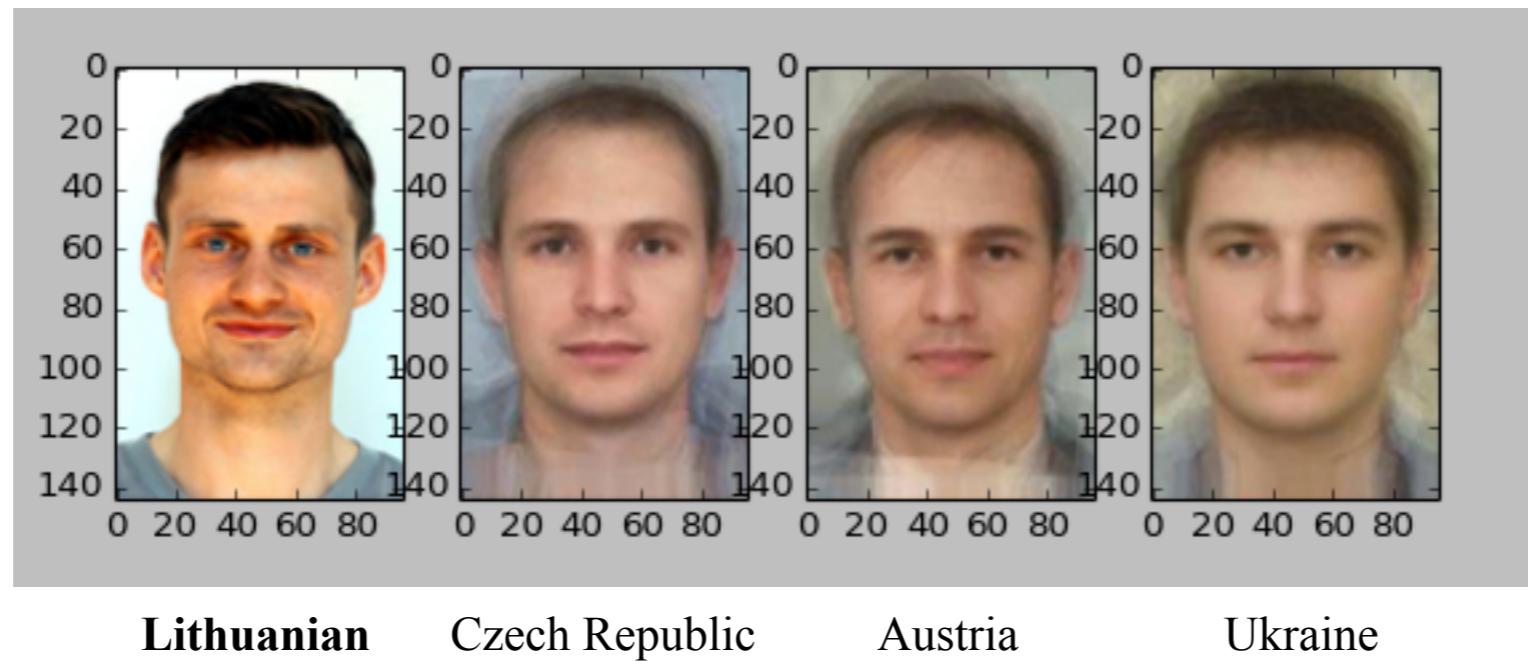


# EigenFaces



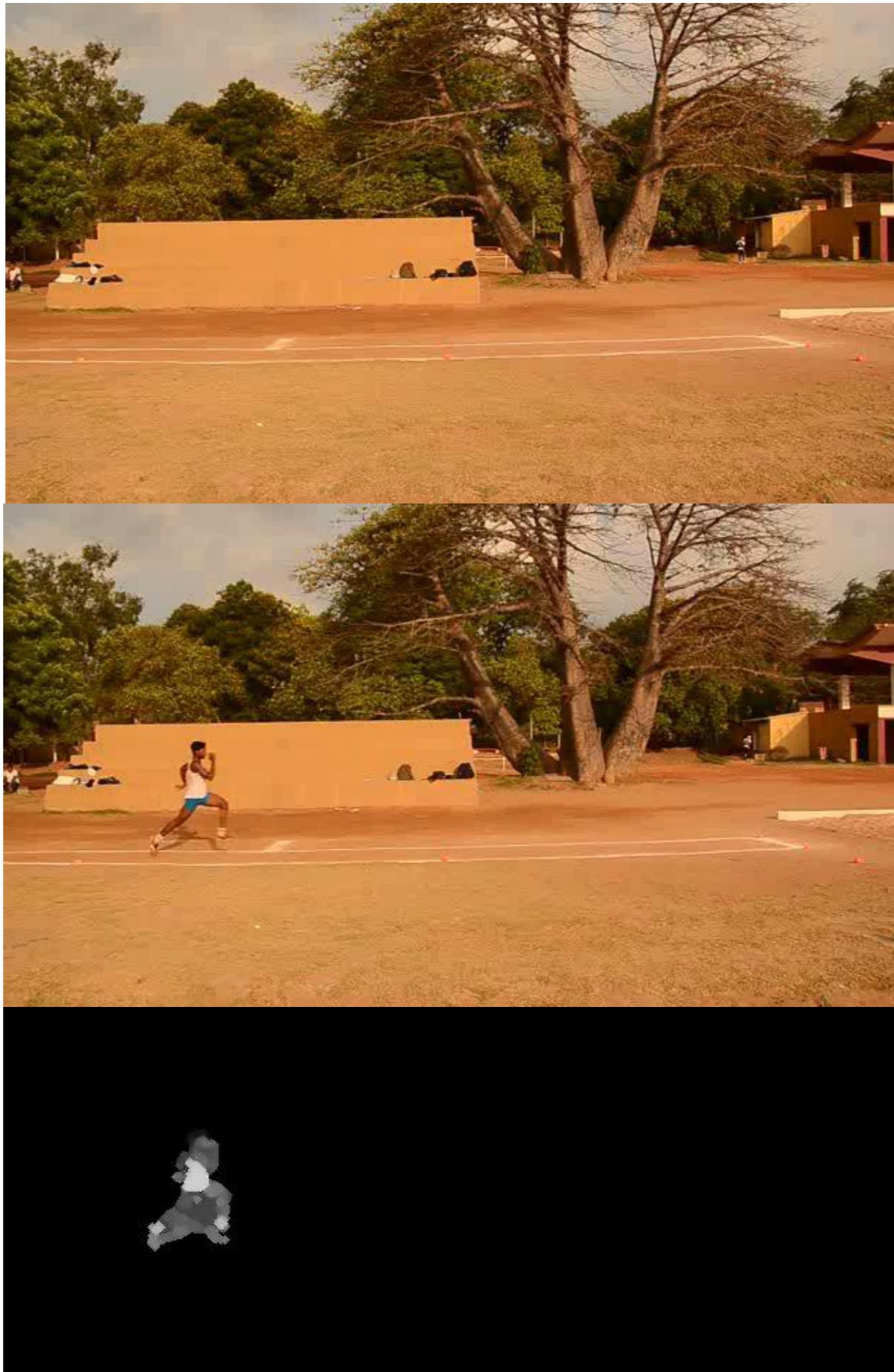




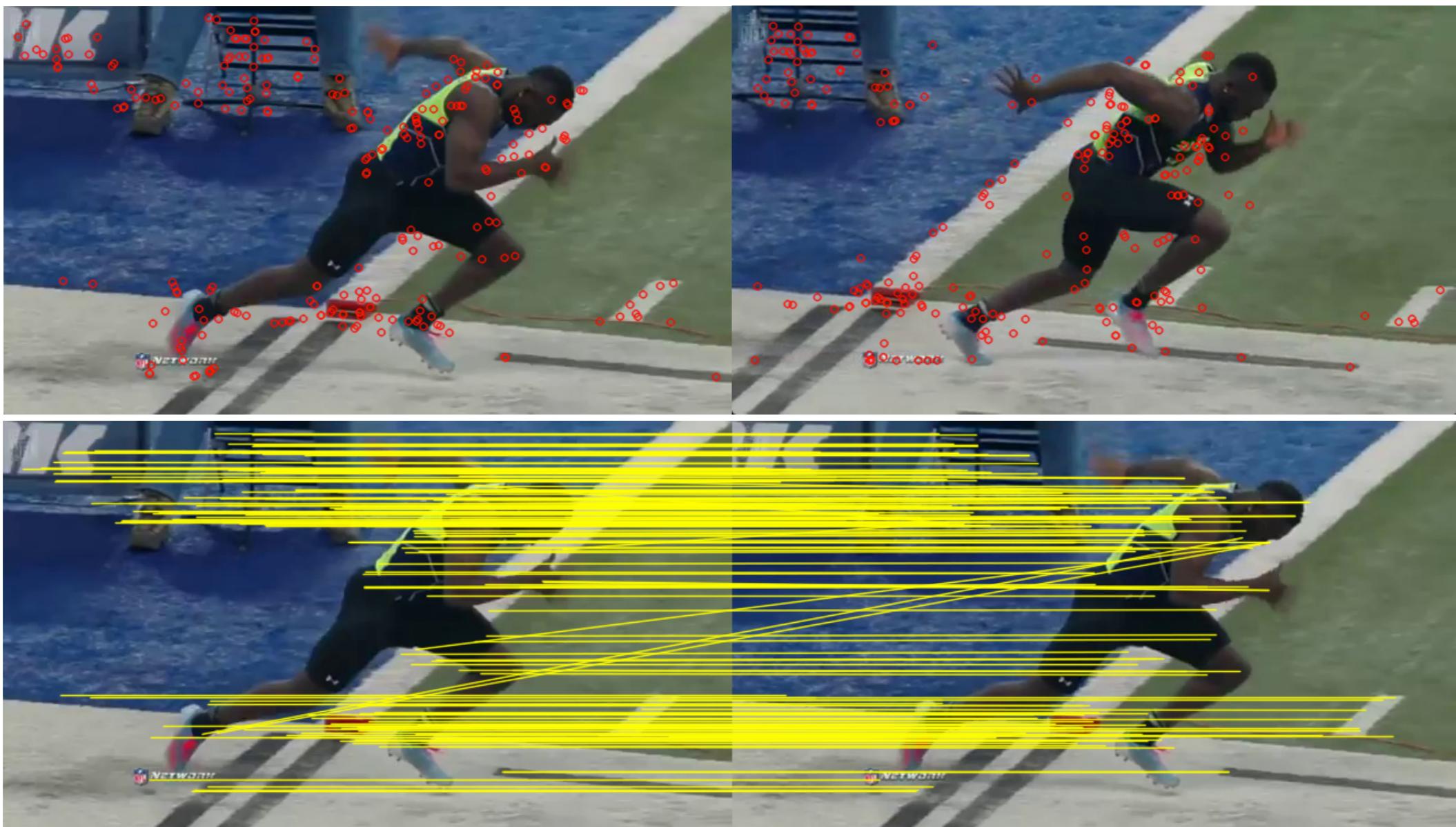


# Background Extraction for Gait Recognition





# Feature Point Detection



# Mosaic Creation

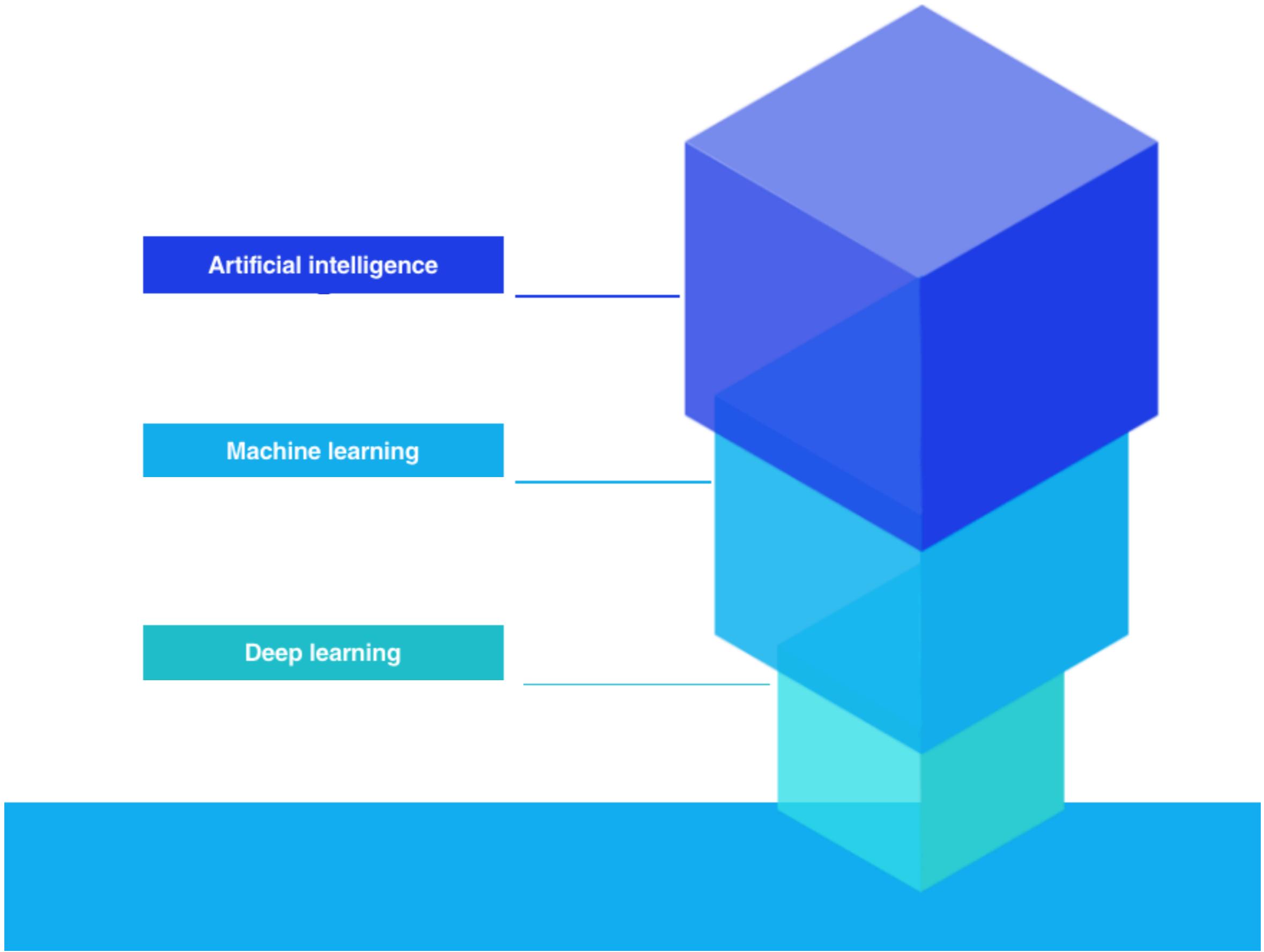












# Artificial Intelligence



# Supervised Machine Learning

Linear  
regression

Logistic  
regression

Linear/  
quadratic  
discriminant  
analysis

Decision tree

Naive Bayes

Support  
vector machine

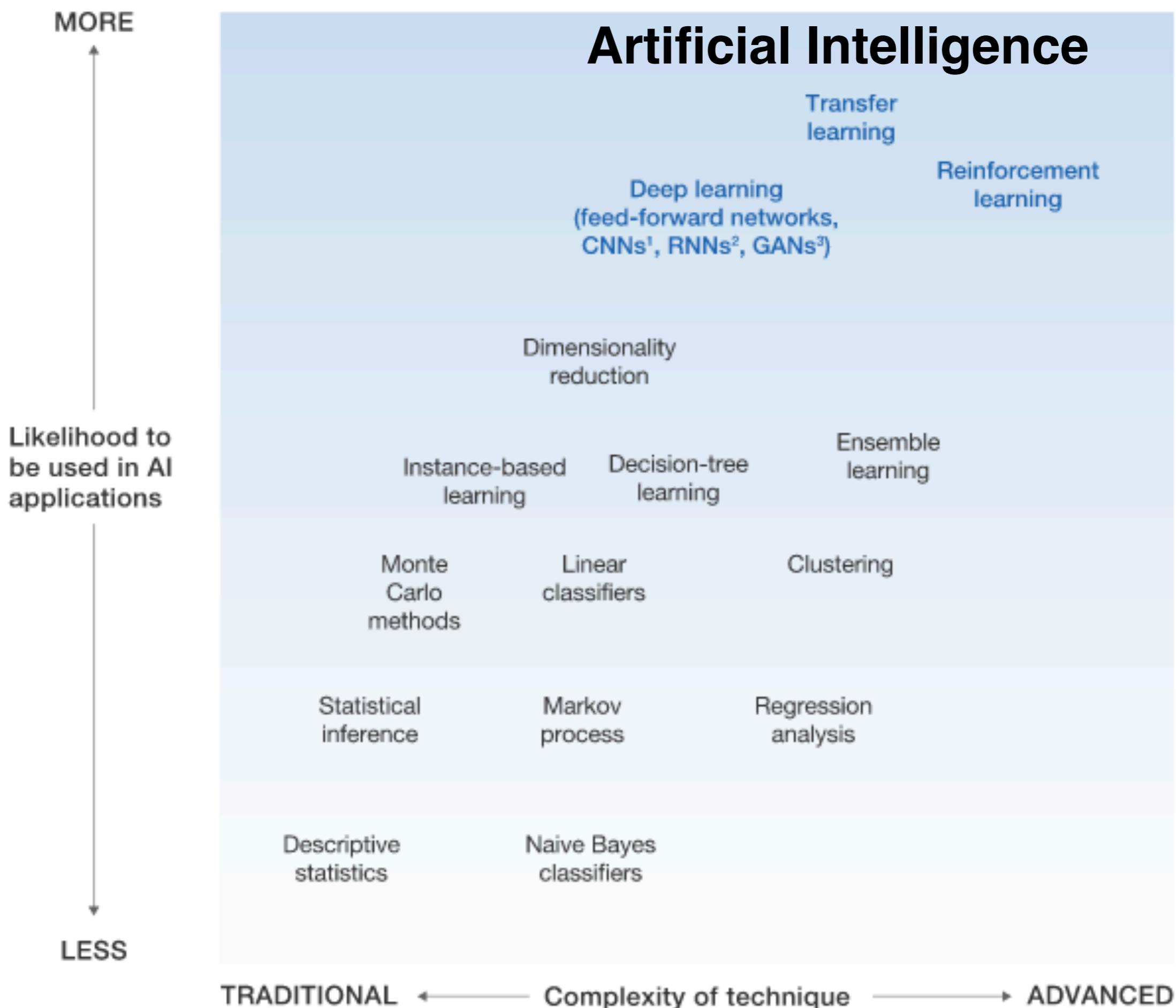
Random  
forest

AdaBoost

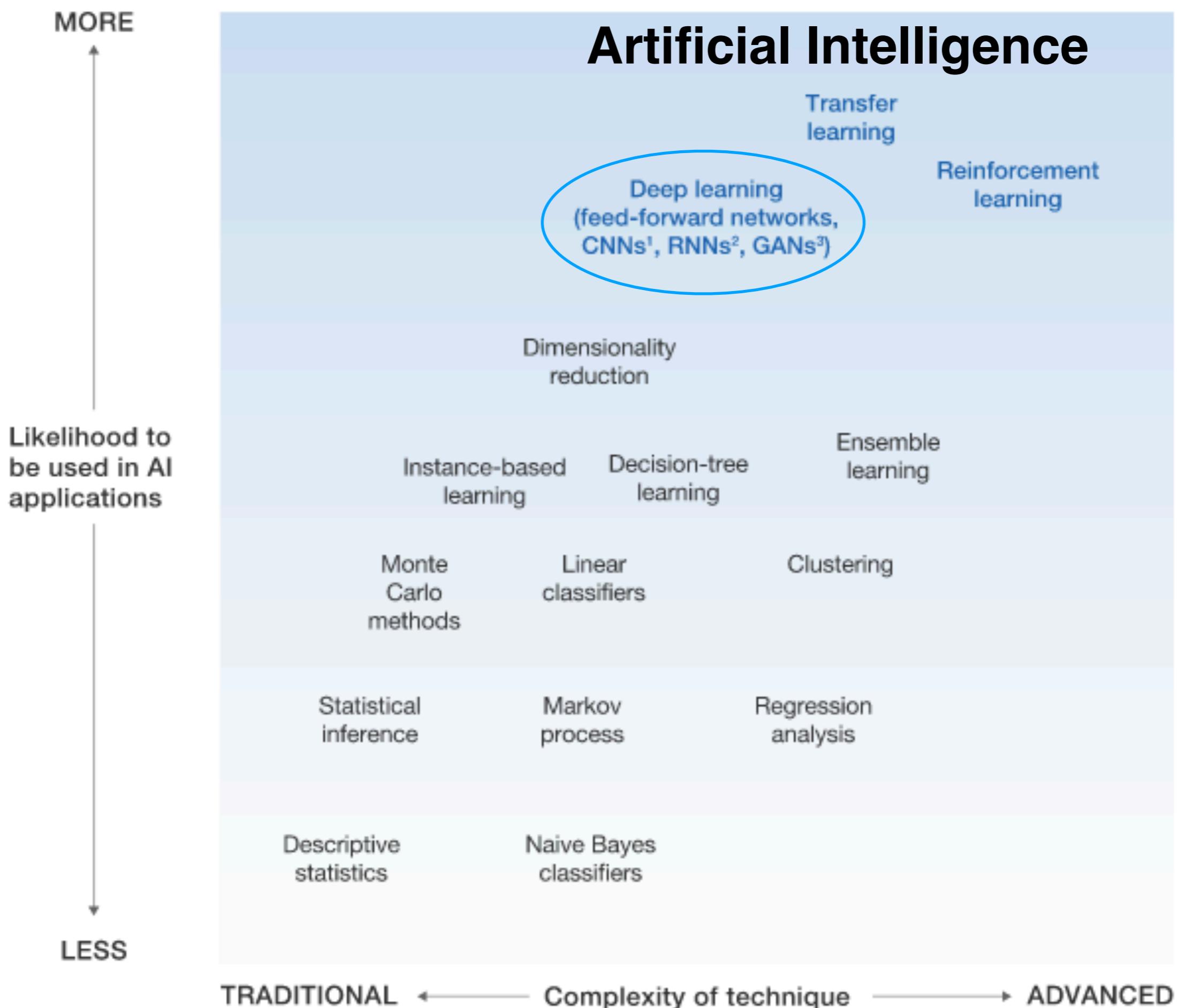
Gradient-  
boosting trees

Simple  
neural network

■ Considered AI

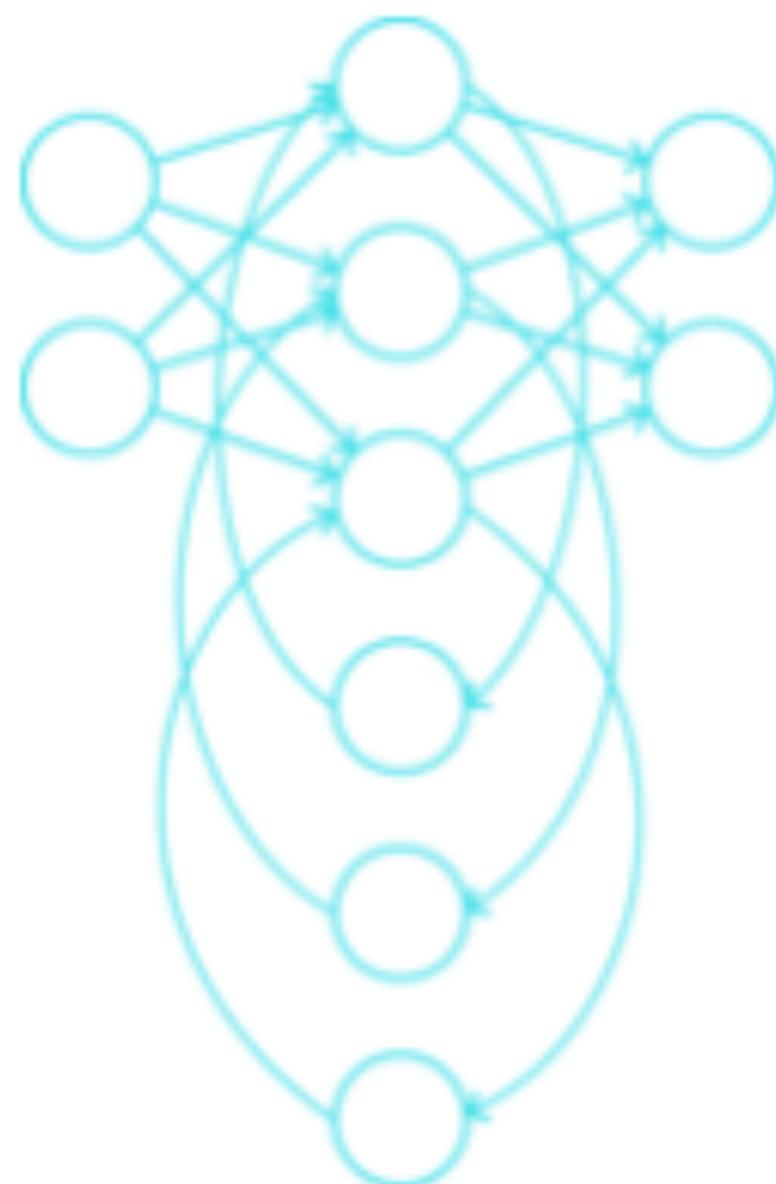


■ Considered AI



# Recurrent Neural Network

Input layer      Hidden layer      Output layer



Context nodes

**May I have your \_\_\_\_\_?**

**May I have your attention?**

**May I have your number?**

**May I have your **keys**?**

# Harry Potter: Written by Artificial Intelligence

*I trained an LSTM Recurrent Neural Network (a deep learning algorithm) on the first four Harry Potter books. I then asked it to produce a chapter based on what it learned. Here's the chapter. (I added a bit of formatting to aid readability)*

## Part 1

“The Malfoys!” said Hermione.

Harry was watching him. He looked like Madame Maxime. When she strode up the wrong staircase to visit himself.

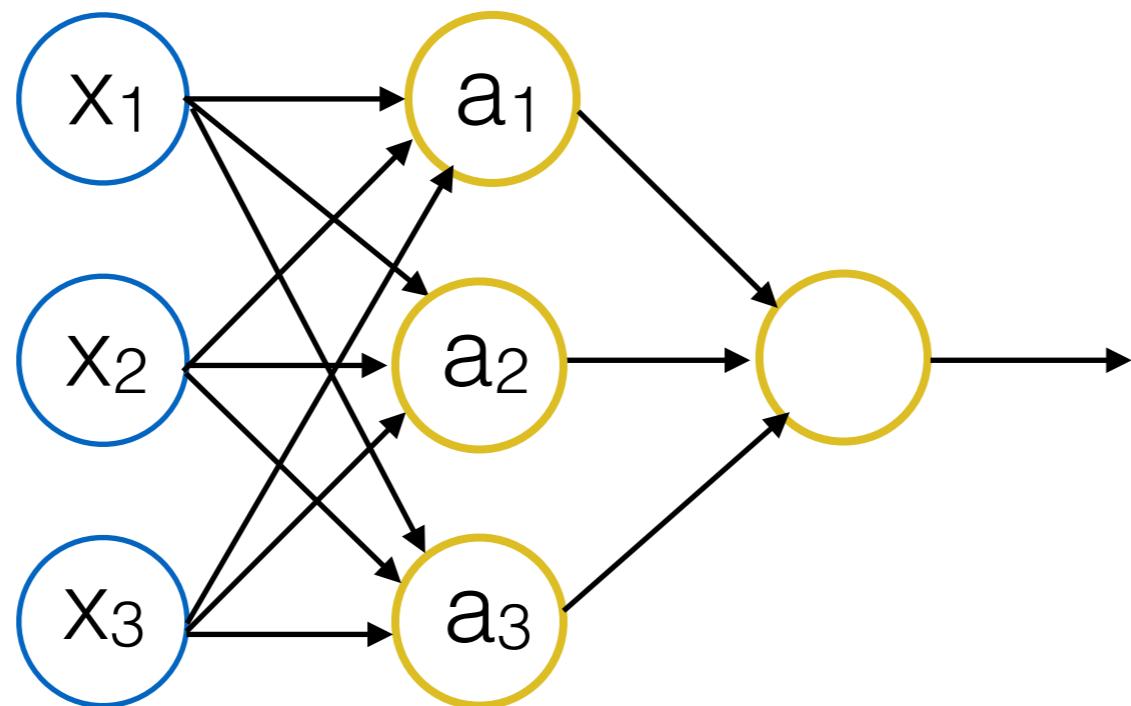
“I’m afraid I’ve definitely been suspended from power, no chance—indeed?” said Snape. He put his head back behind them and read groups as they crossed a corner and fluttered down onto their ink lamp, and picked up his spoon. The doorbell rang. It was a lot cleaner down in London.

Hermione yelled. The party must be thrown by Krum, of course.

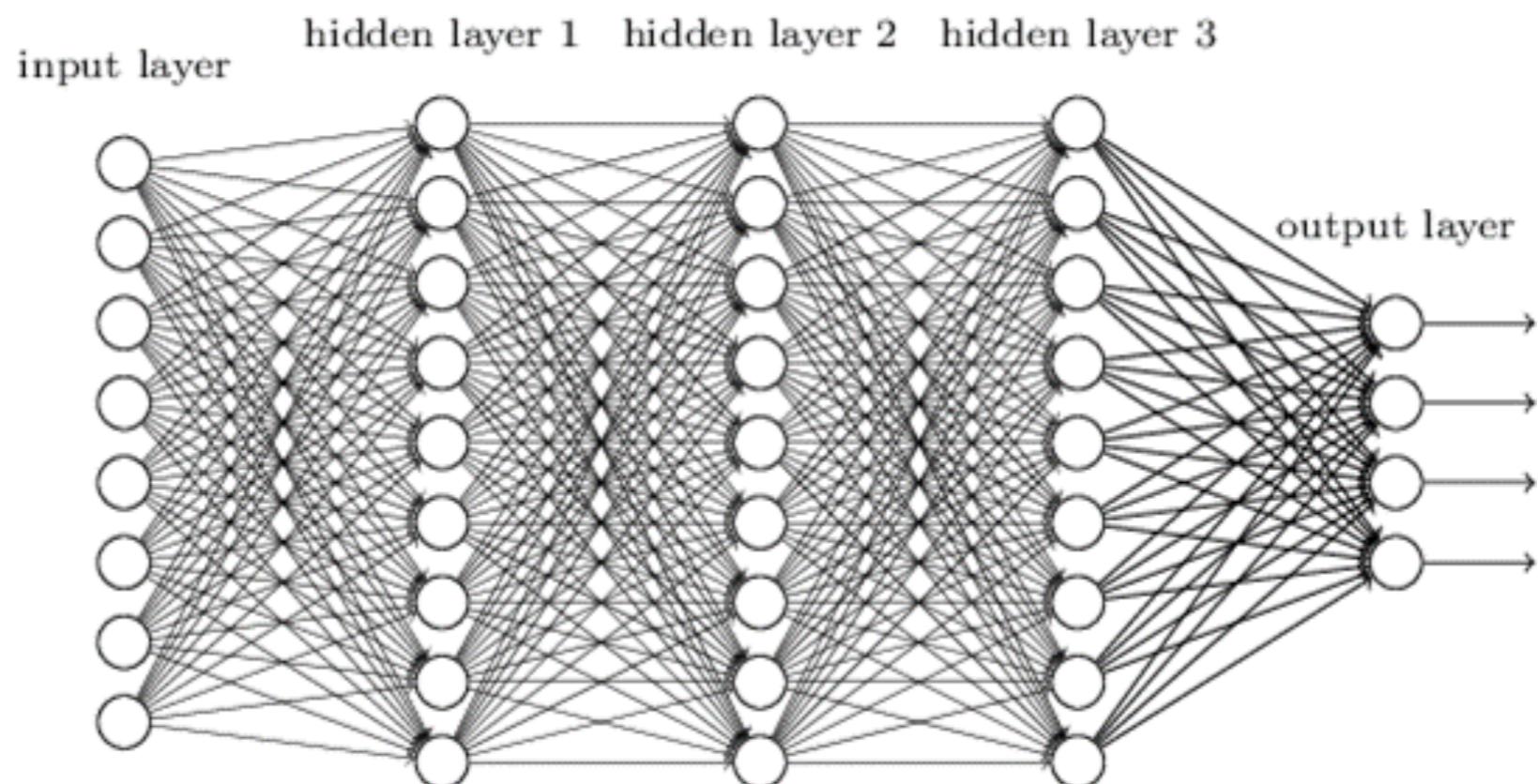
Harry collected fingers once more, with Malfoy. “Why, didn’t she never tell me. . . .” She vanished. And then, Ron, Harry noticed, was nearly right.

“Now, be off,” said Sirius, “I can’t trace a new voice.”

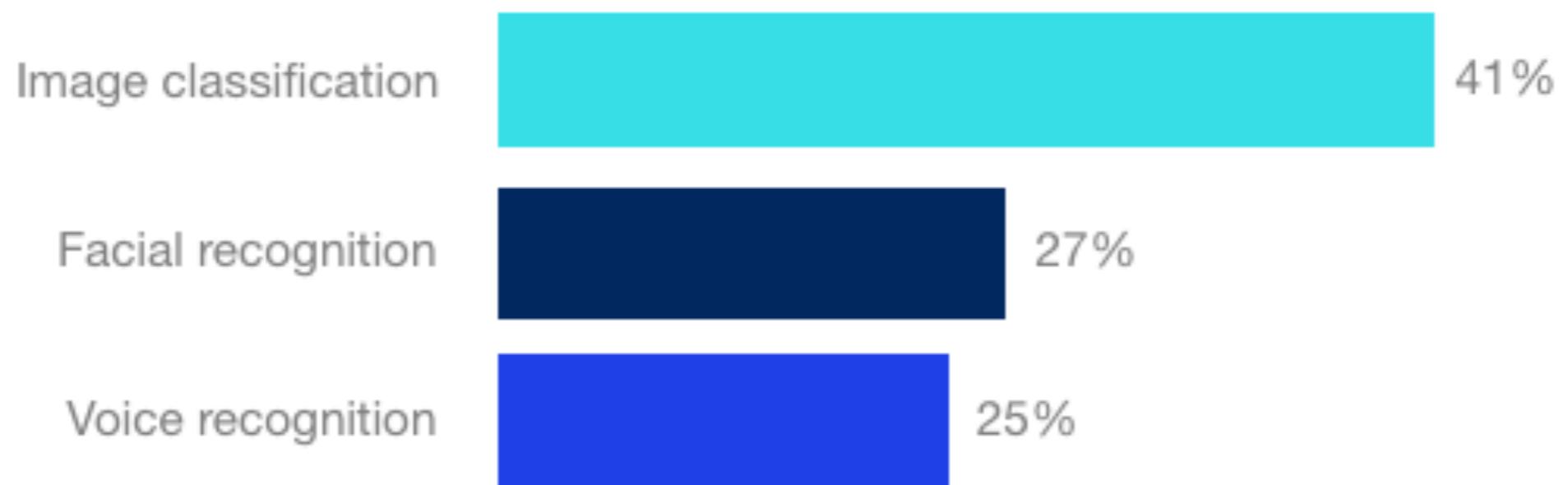
# Neural Network



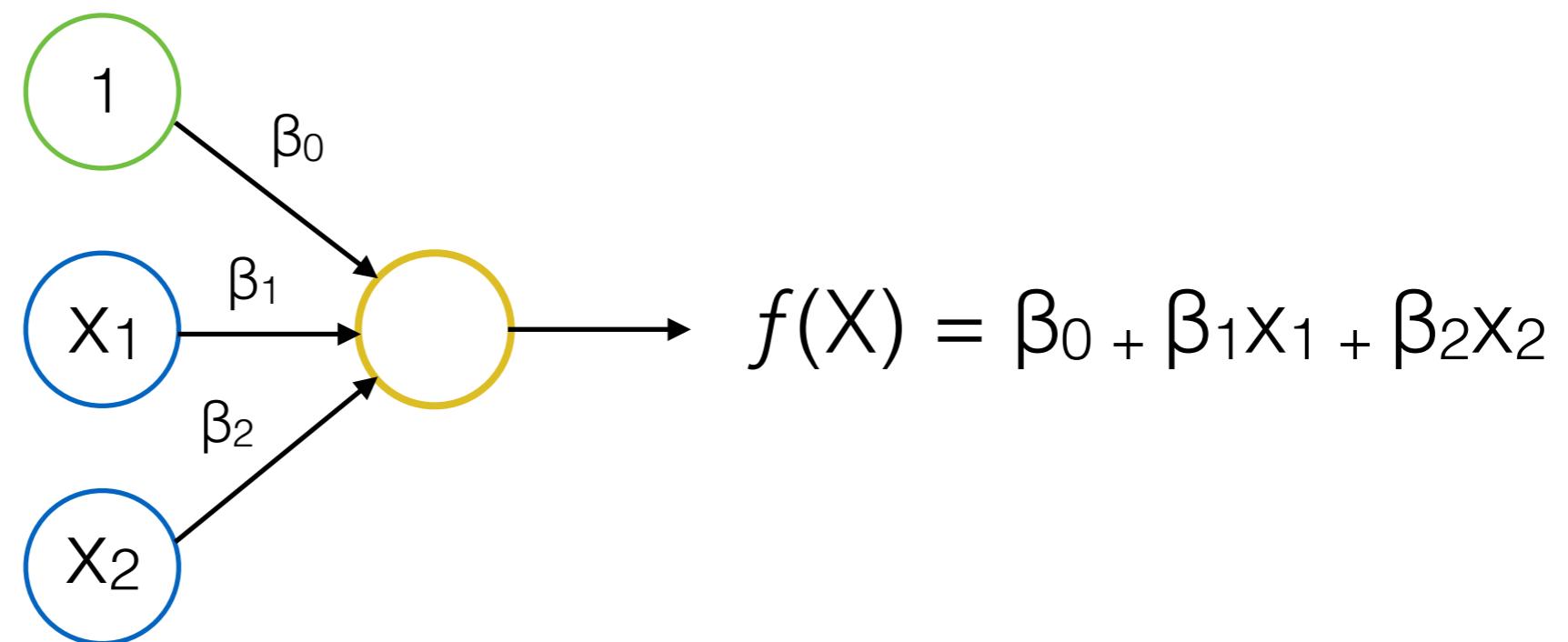
# Deep Learning



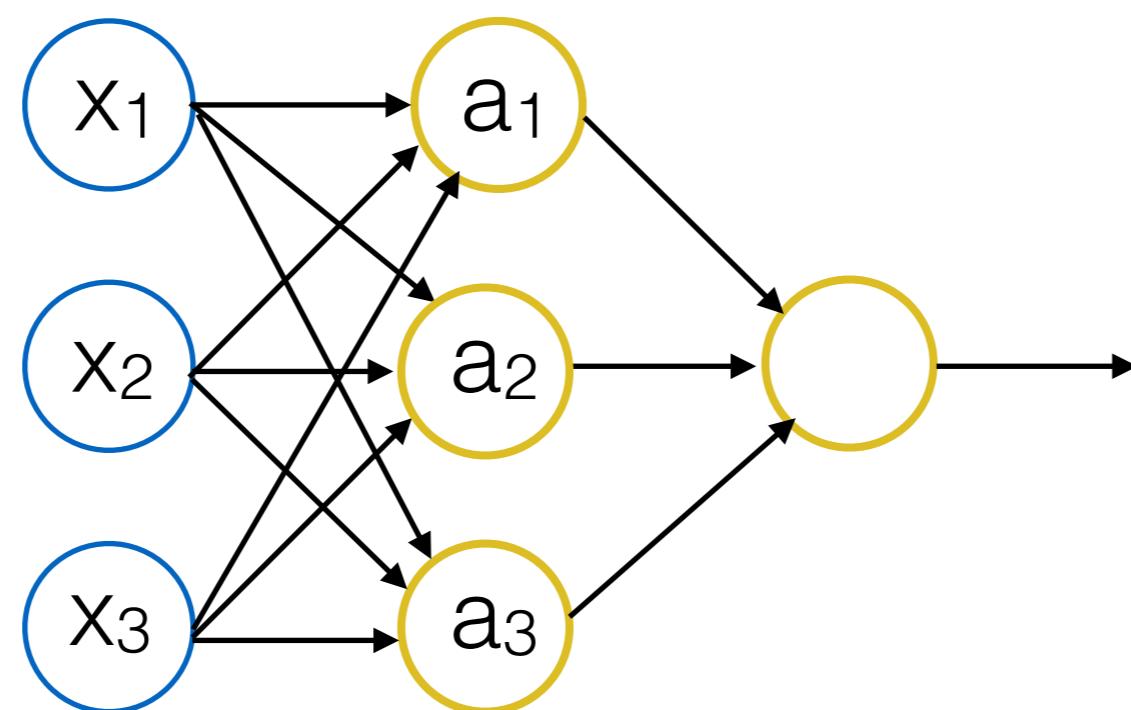
# Deep Learning vs Traditional Methods



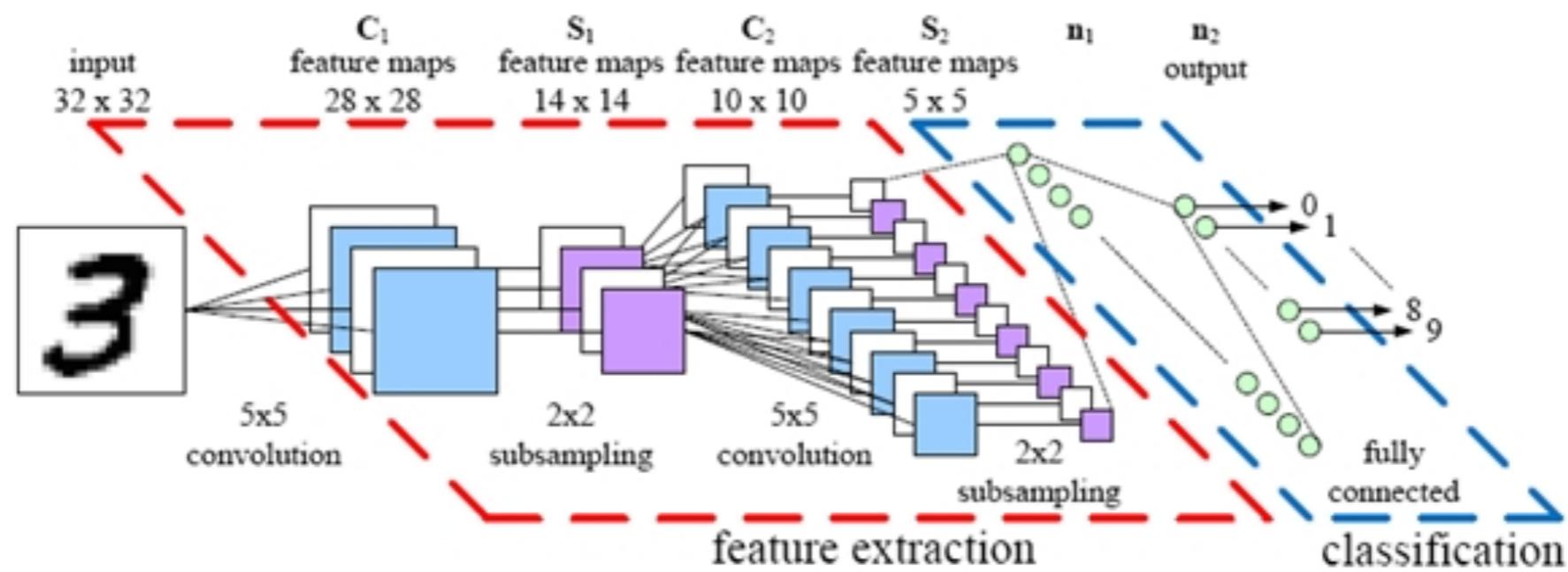
# Perceptron

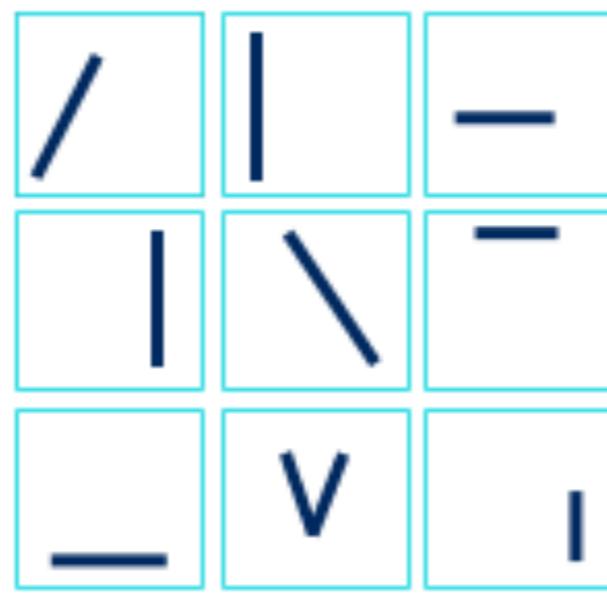
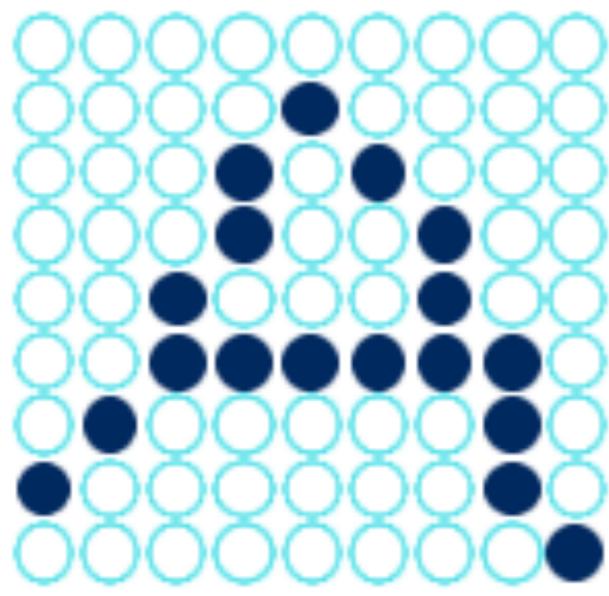


# Feed Forward Network



# Convolutional Neural Network



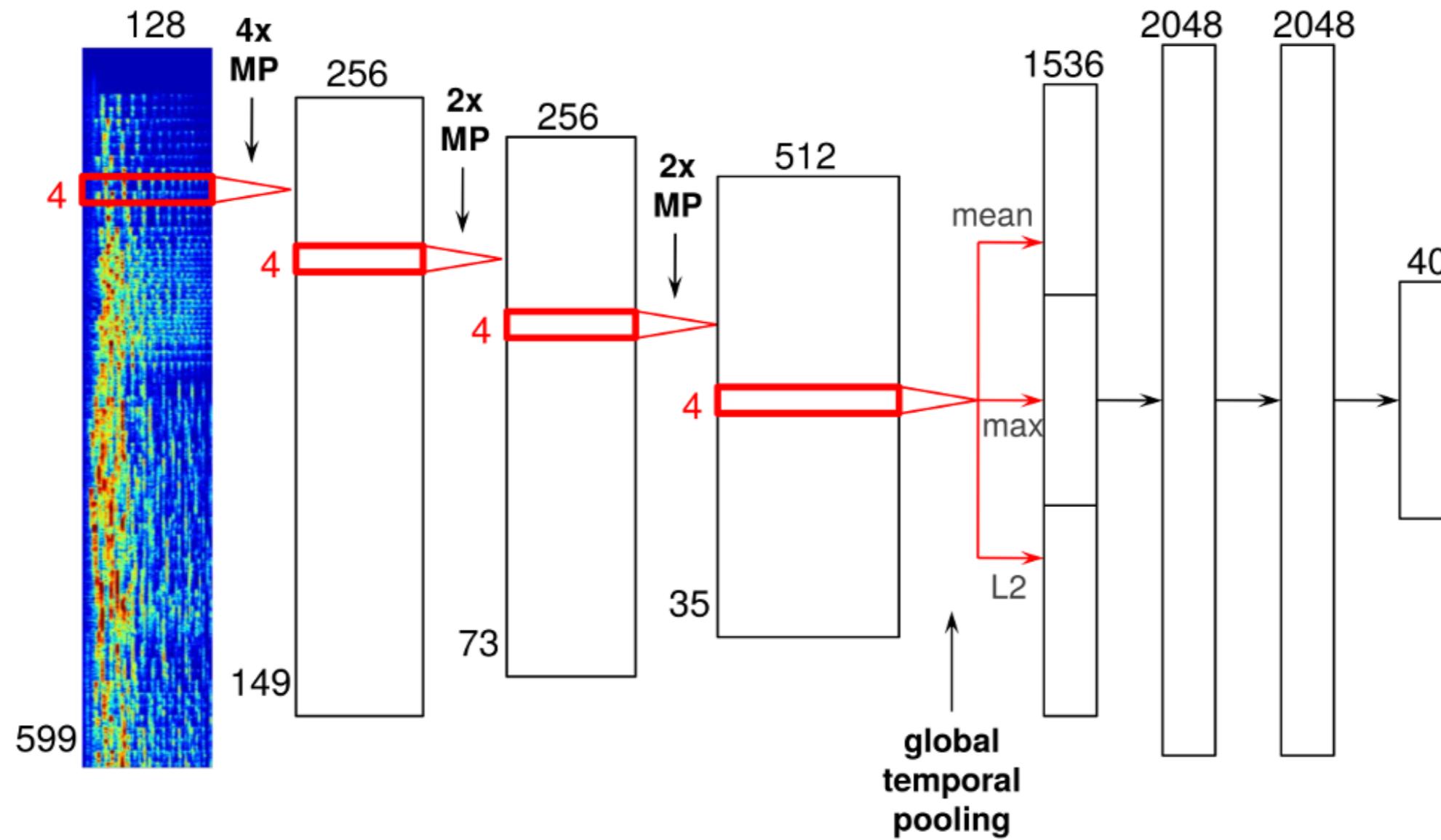


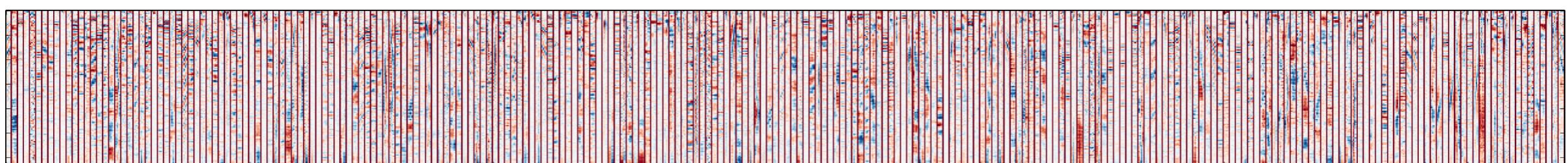
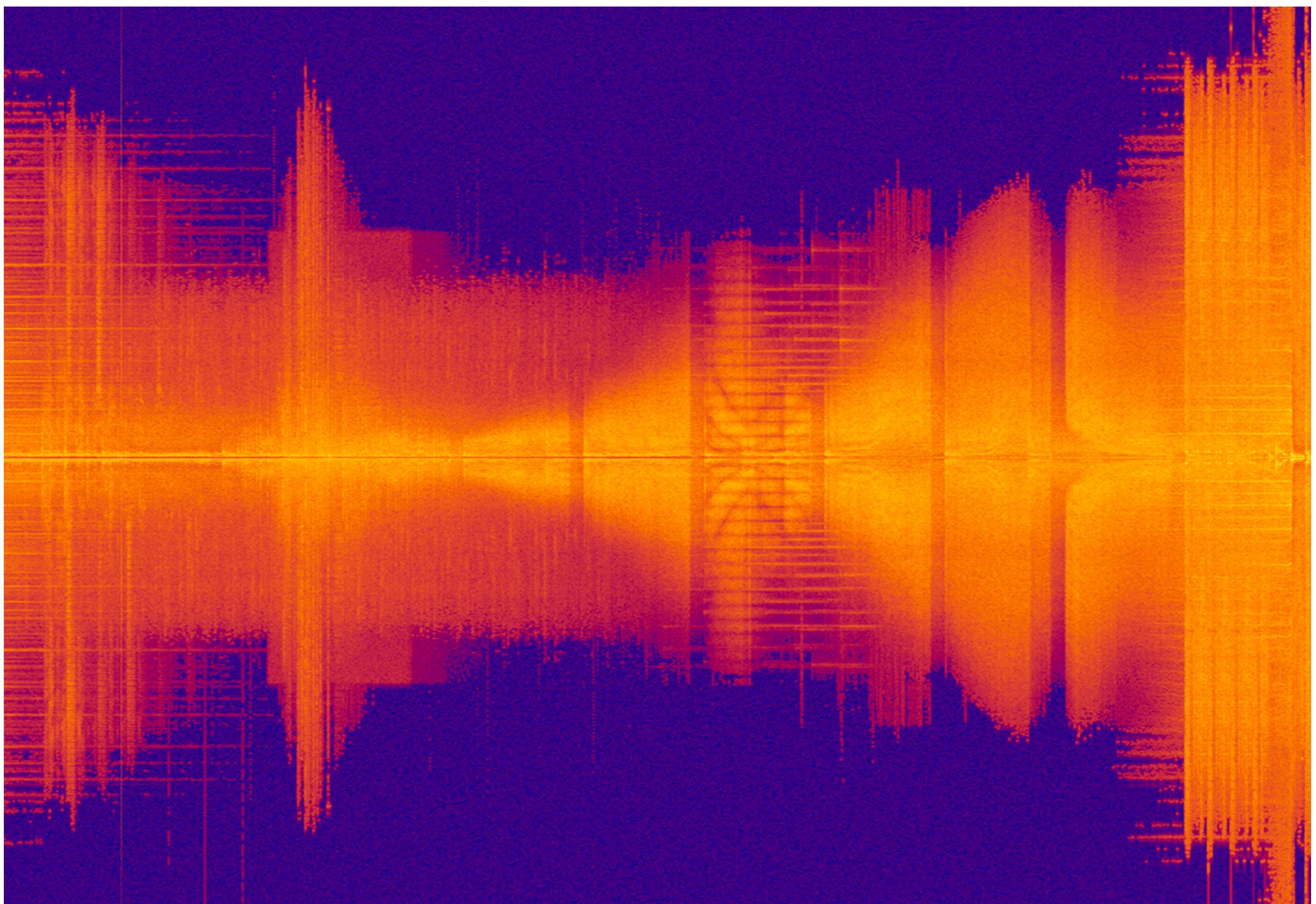
**A**B**C**D**E**F**G**  
**H**I**J**K**L**M**N**O  
**P**Q**R**S**T**U**V**  
**W**X**Y**Z



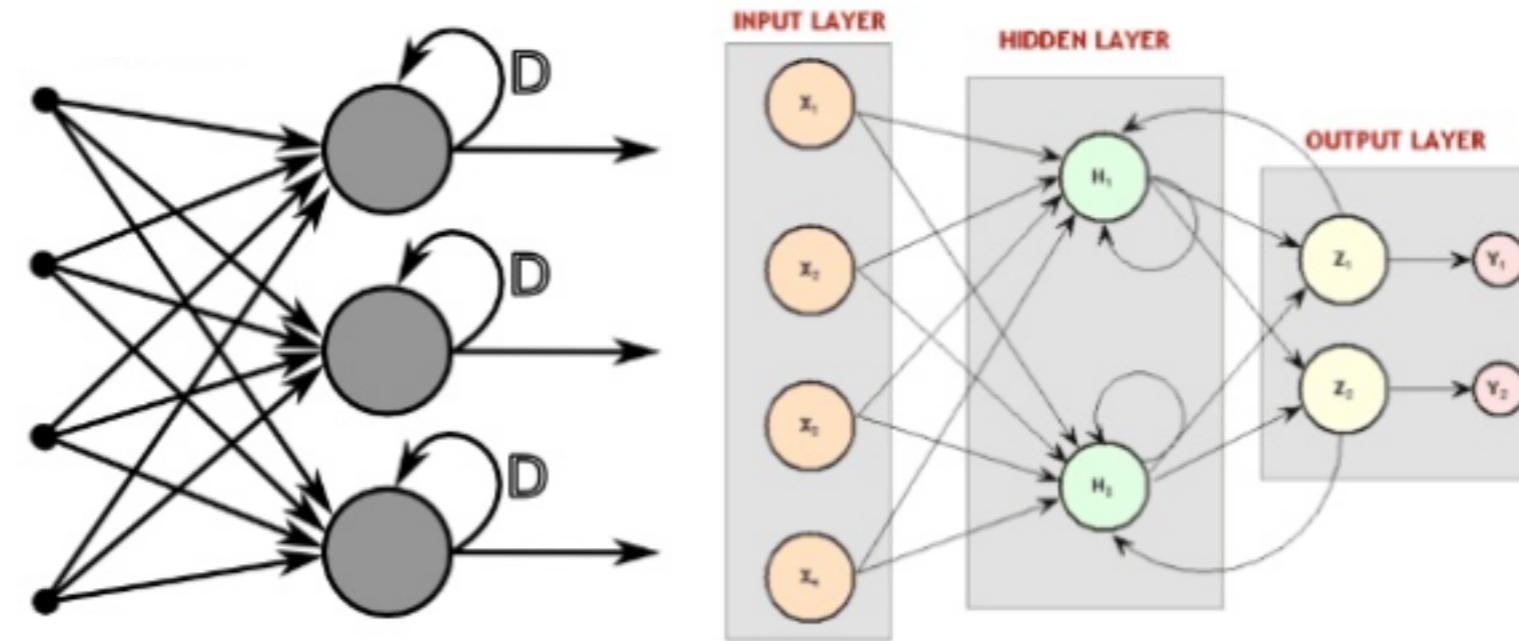
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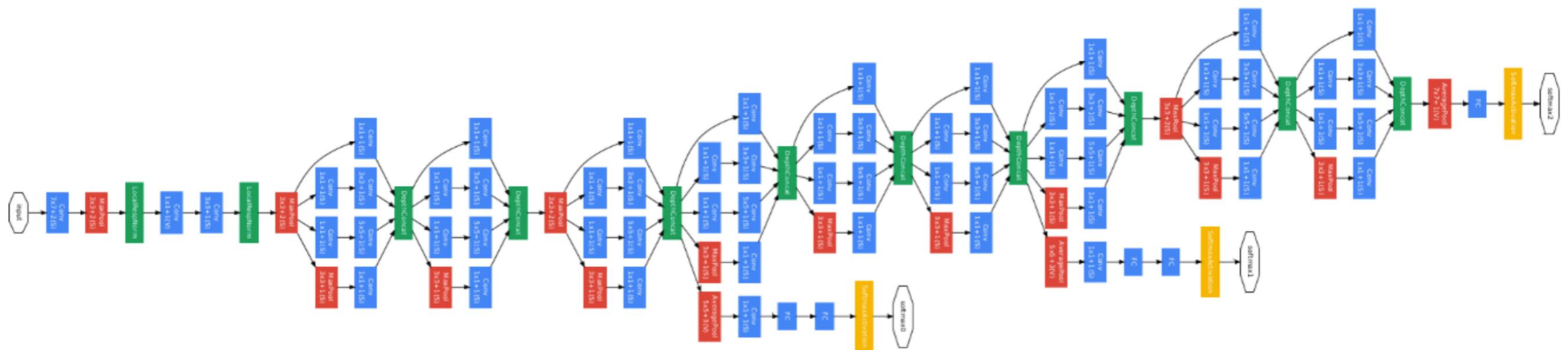


# Recurrent Neural Network



# Google Deep Dream

22 layers



# Pareidolia

# Pareidolia



# Pareidolia



# Pareidolia



# Pareidolia



# Pareidolia



# Pareidolia



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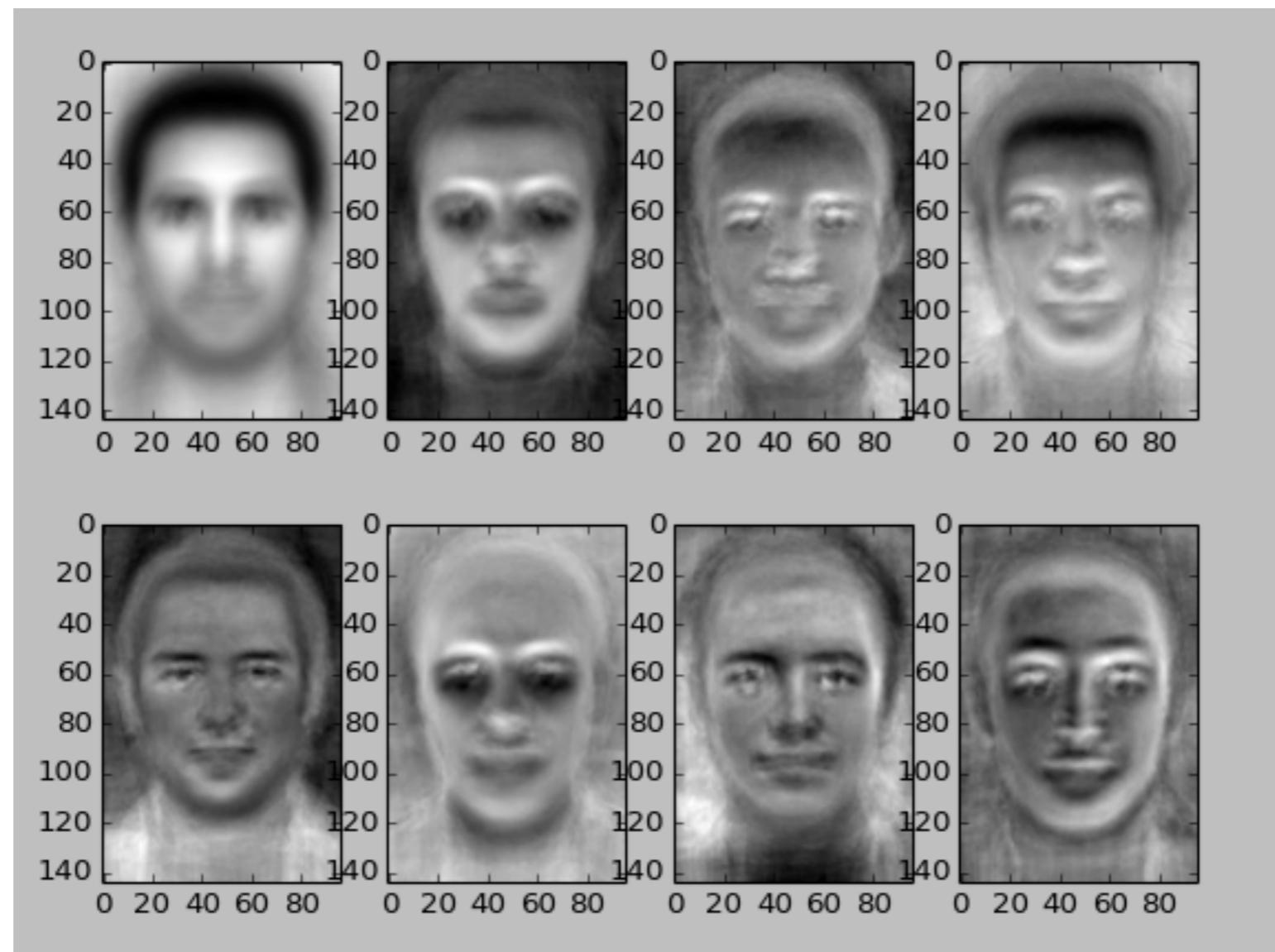




# Gait Energy Image



# Eigenfaces



















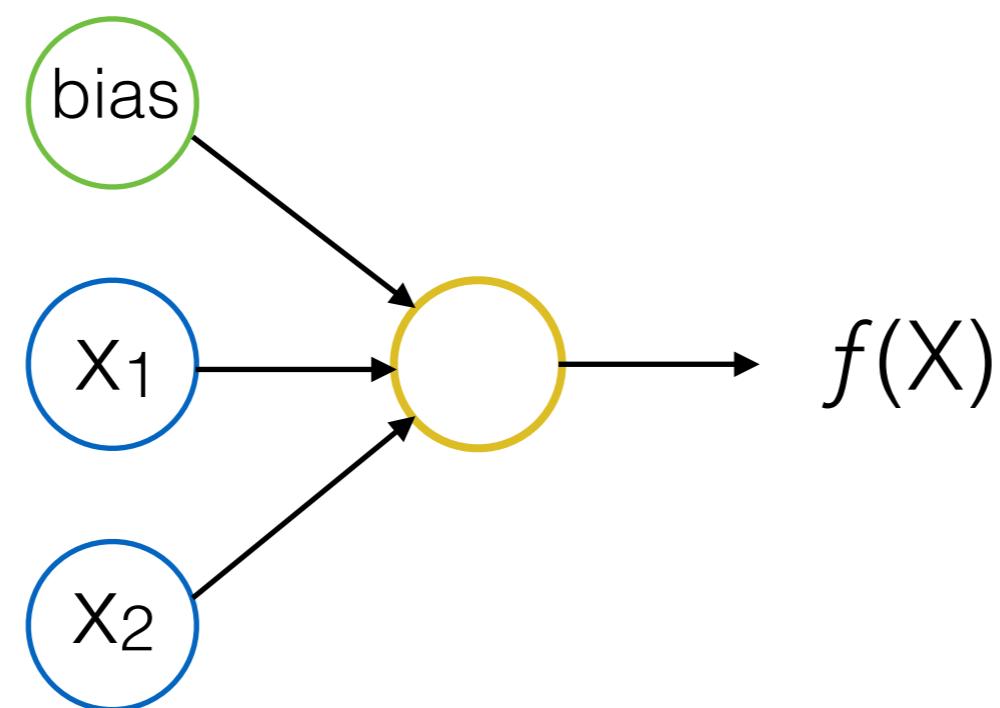




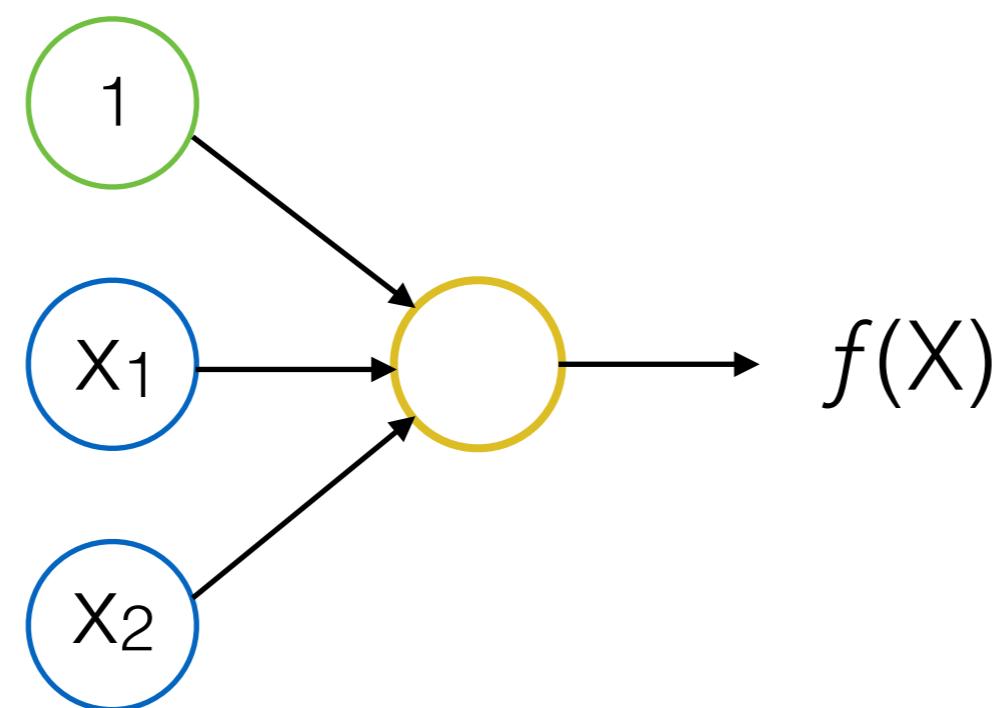


# **Neural Network**

# Perceptron



# Perceptron



# Perceptron

