

# Deep Learning with TensorFlow and Keras



**Jerry Kurata**

Consultant, Pluralsight Author





“AI is the new Electricity.”

Andrew Ng – Google Brain, Baidu, Stanford, Coursera

# Artificial Intelligence

“The theory and development of computer systems able to perform tasks that normally require human intelligence.”

Wikipedia

# Artificial Intelligence

“The theory and development of computer systems able to perform tasks that normally require human intelligence.”

Wikipedia



# Machine Learning

“A subfield of computer science that gives computers the ability to learn without being explicitly programmed.”

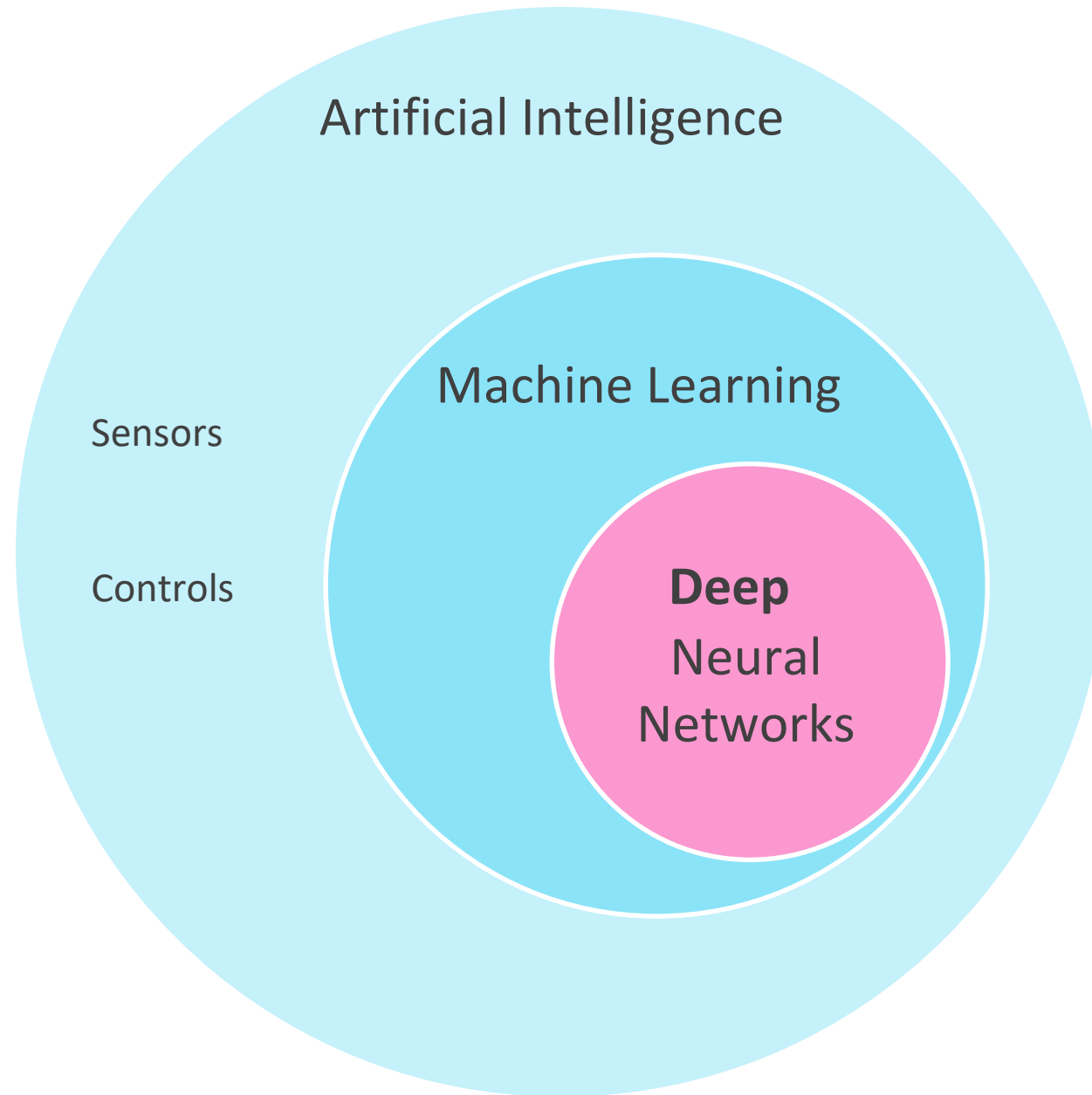
Wikipedia



# Machine Learning

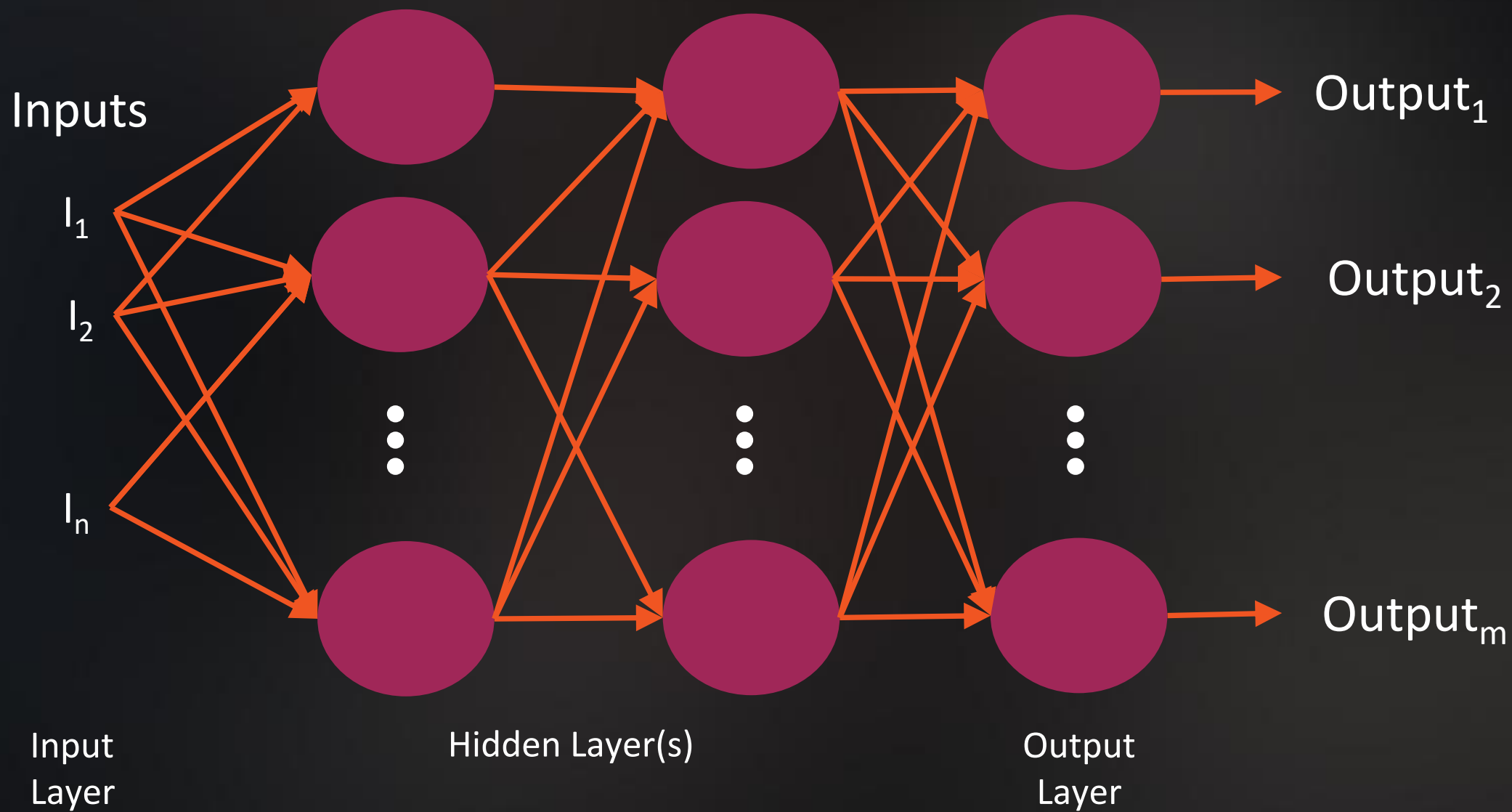
“A subfield of computer science that gives computers the ability to **learn without being explicitly programmed.**”

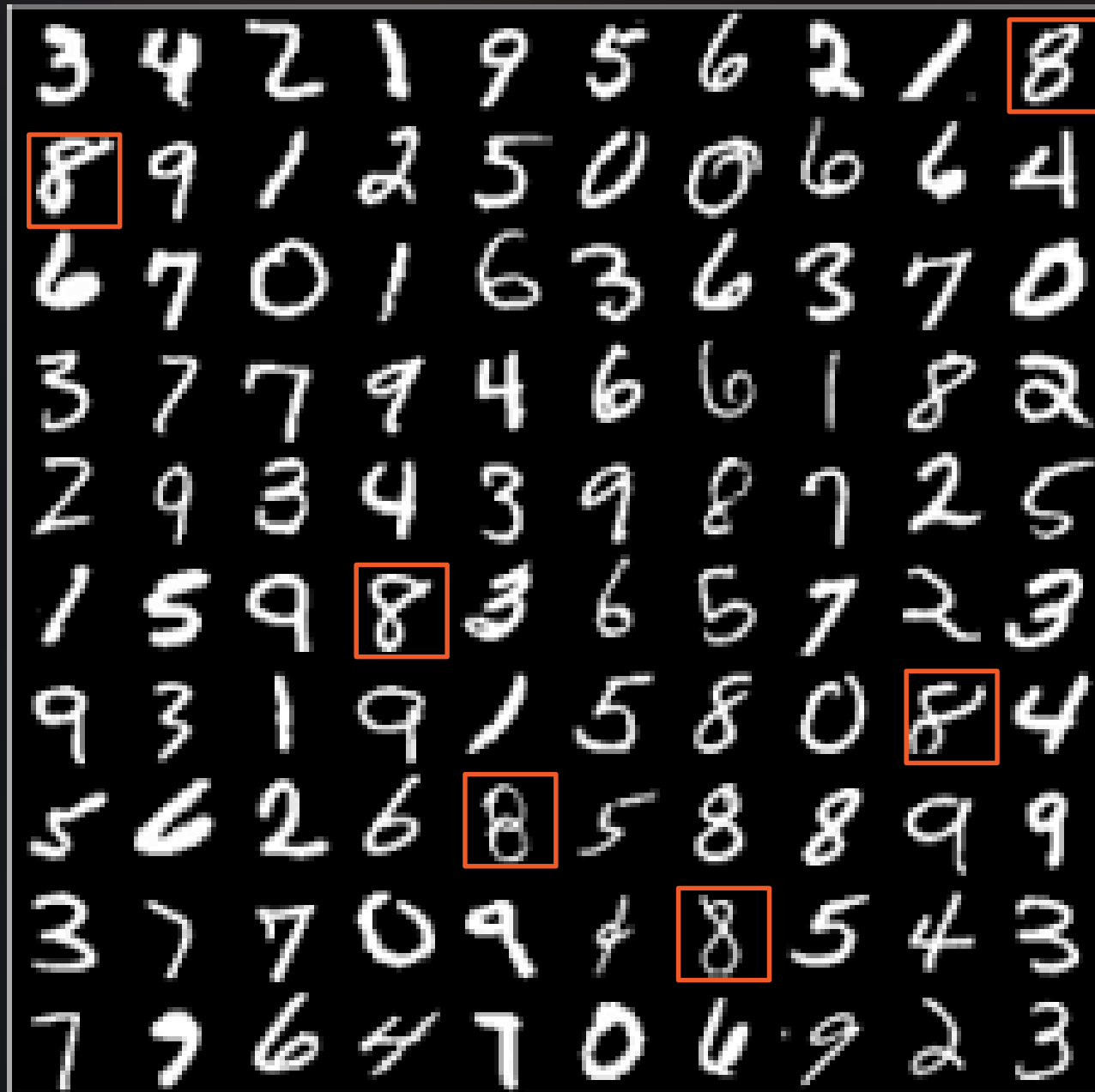
Wikipedia





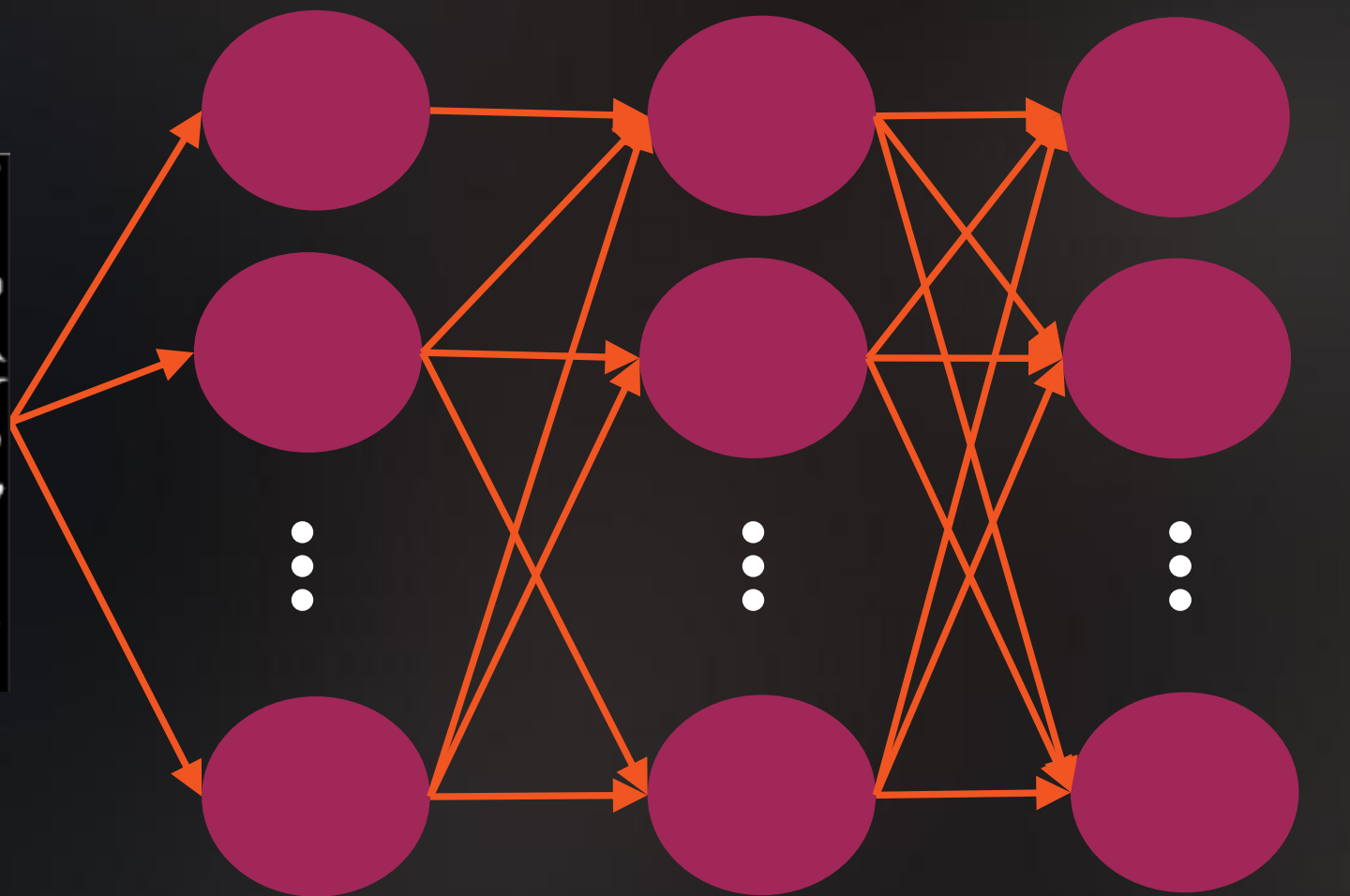
# Neural Network





MNIST digits

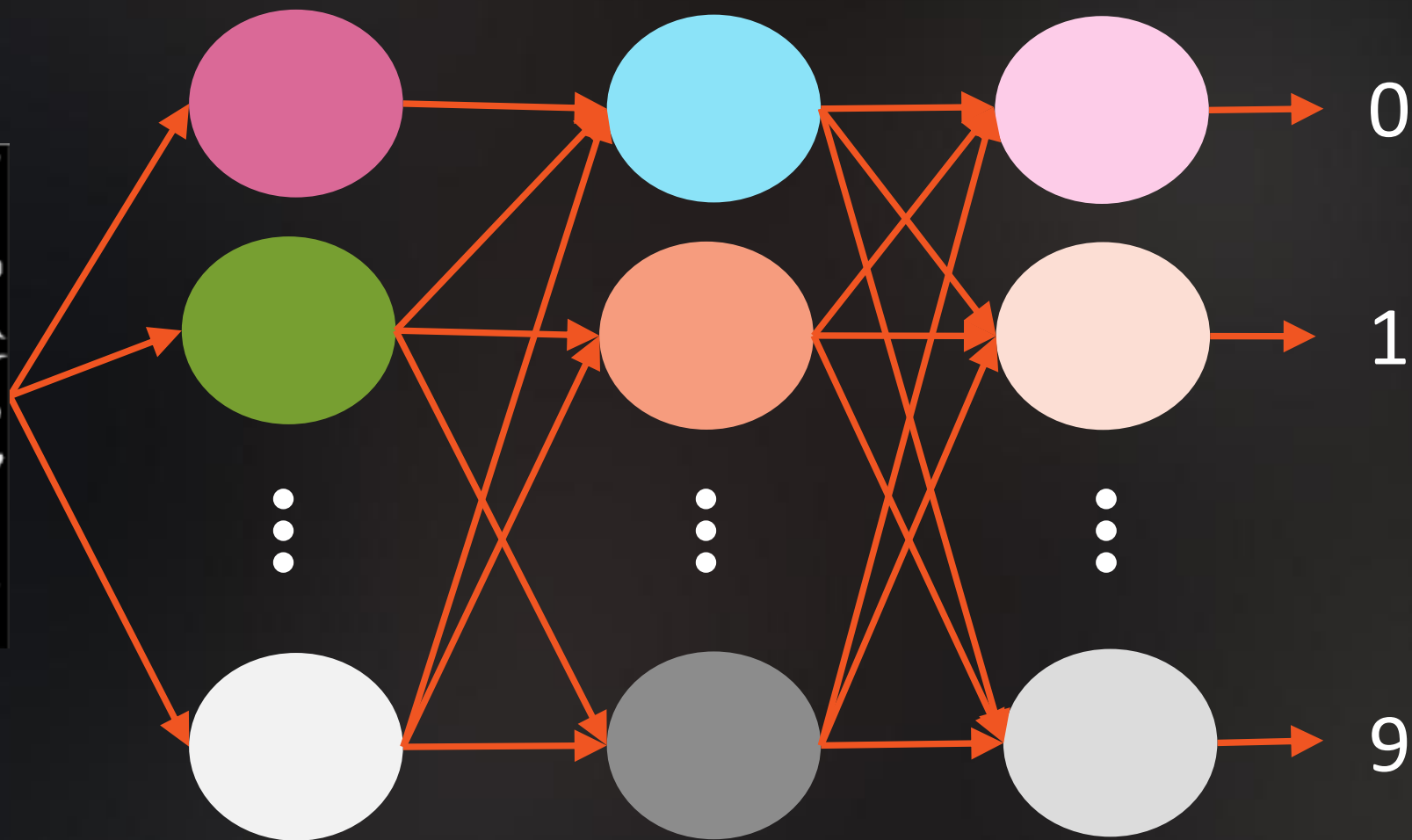
# Training Neural Network



Hidden Layer(s)

Output Layer  
(0-9)

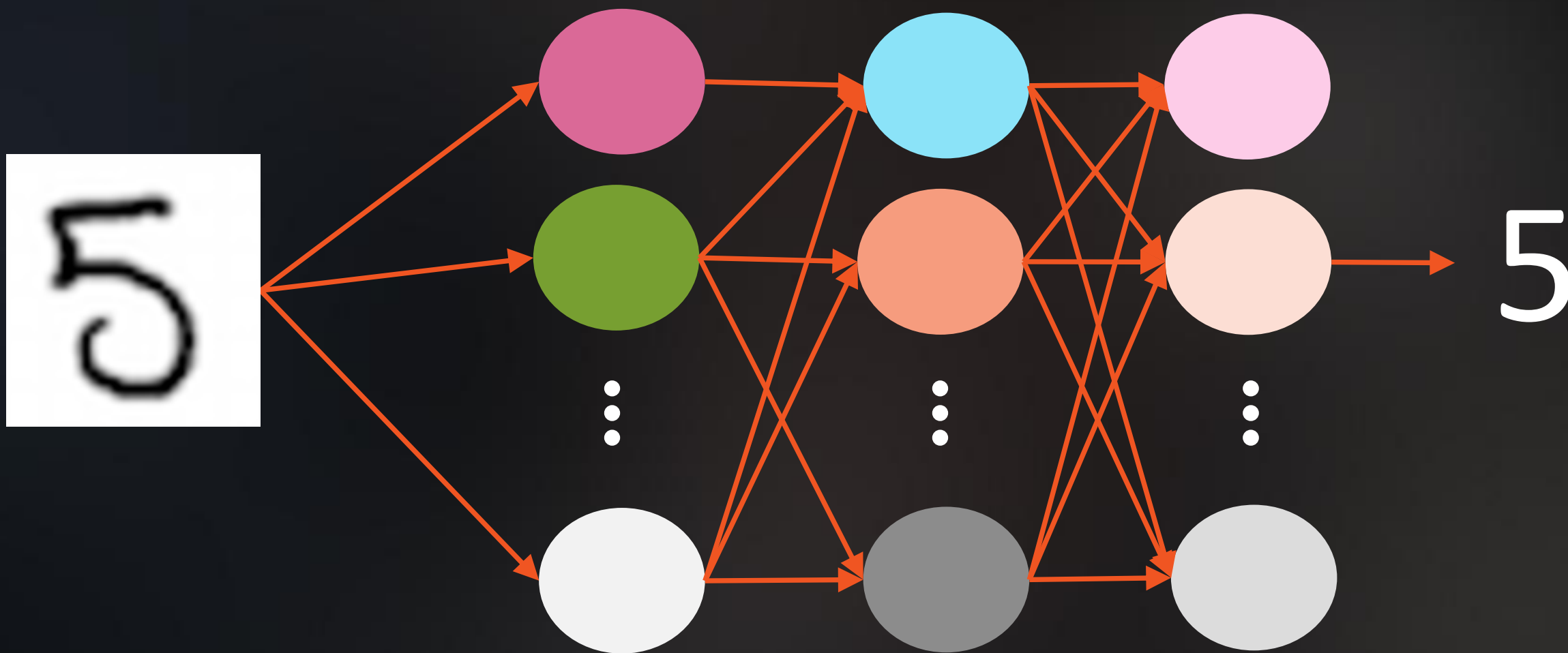
# Training Neural Network



Curvature, Size, ...

???

# Trained Deep Neural Network



Machine Learning logic is  
defined by the data, not by  
explicit programming

---

# Deep Learning Tools

- Python
- Scikit-Learn
- Tensorflow, CNTK, Theano
- Keras

# Pluralsight courses

Understanding Machine Learning with  
Python

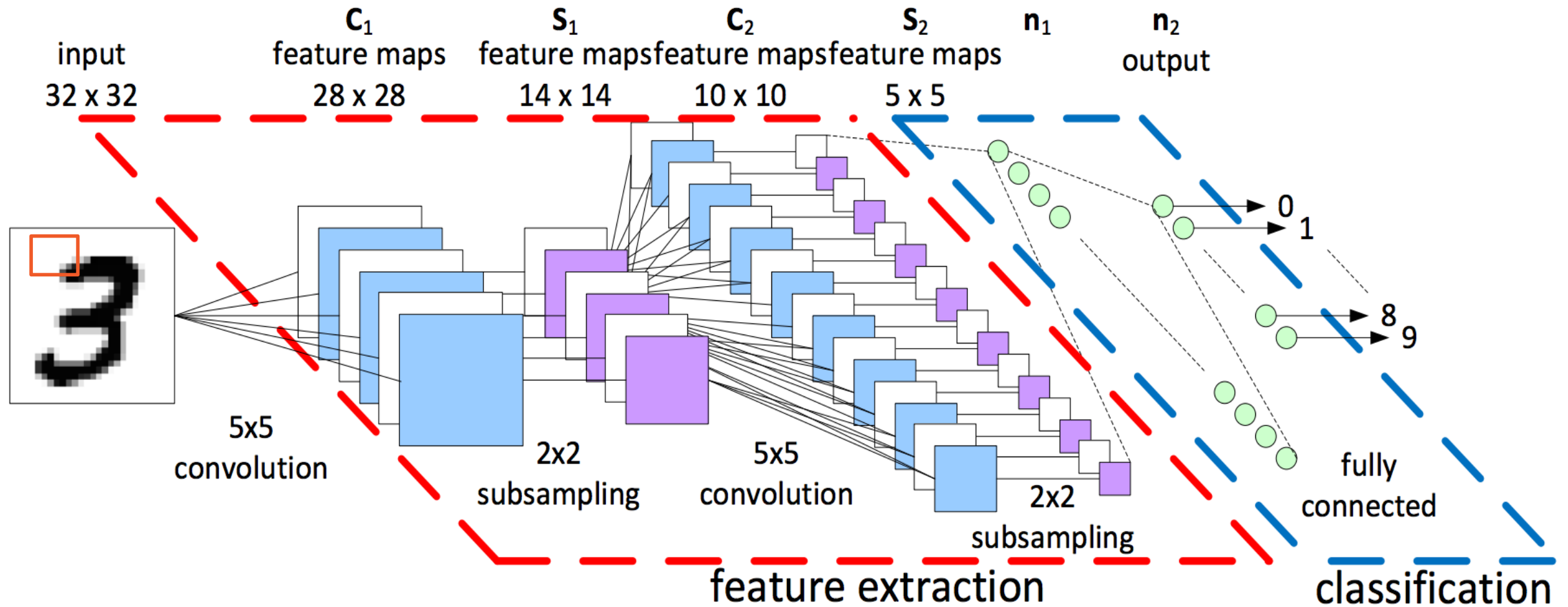
Tensorflow: Getting Started

Deep Learning with Keras – In Progress

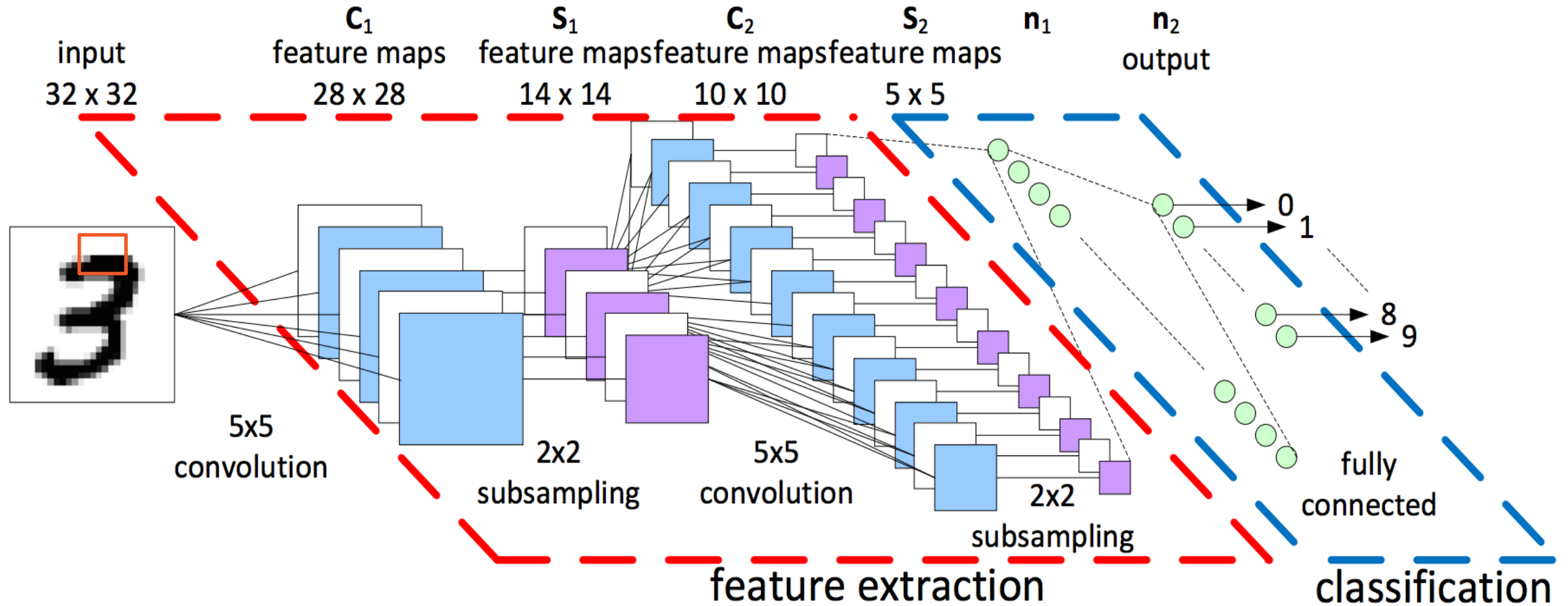


# Overview of Convolutional Neural Network Demo

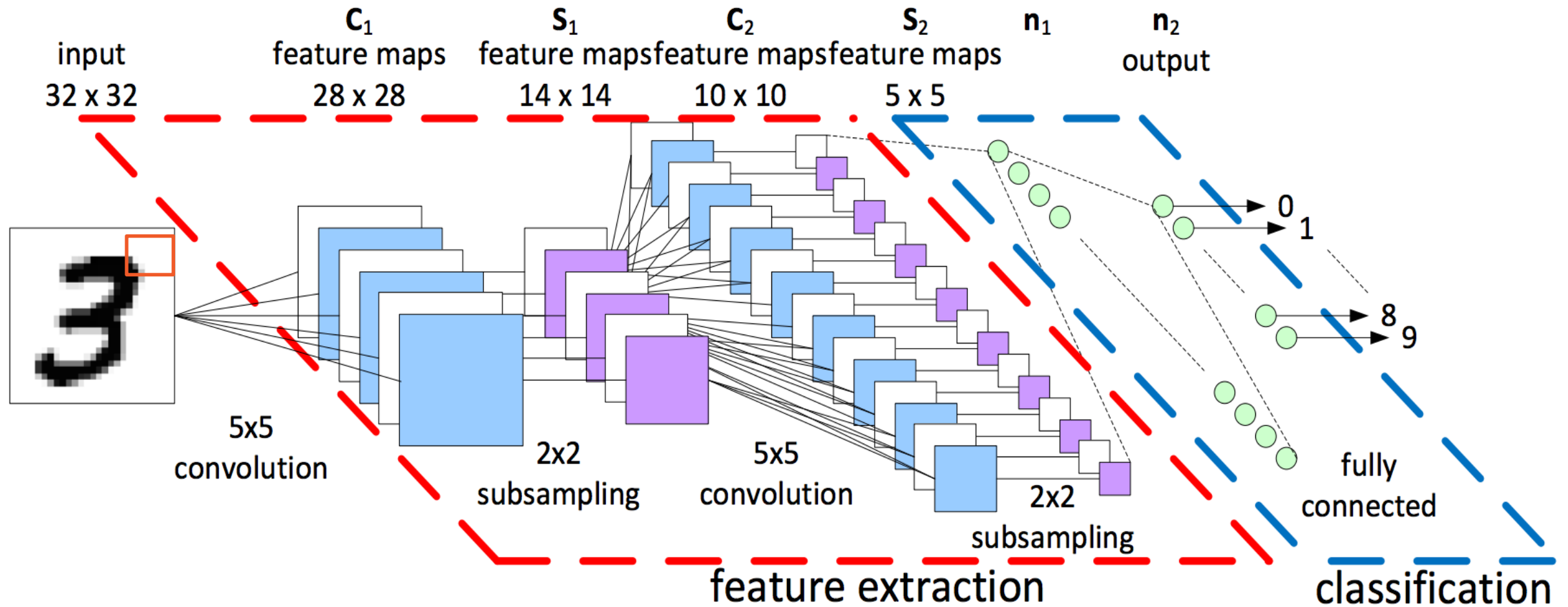
# MNIST Convolution NN



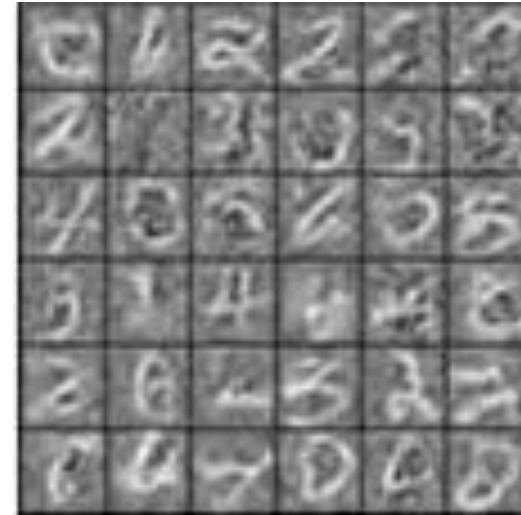
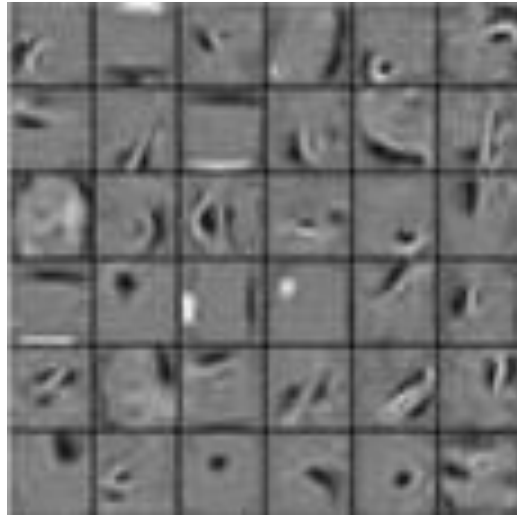
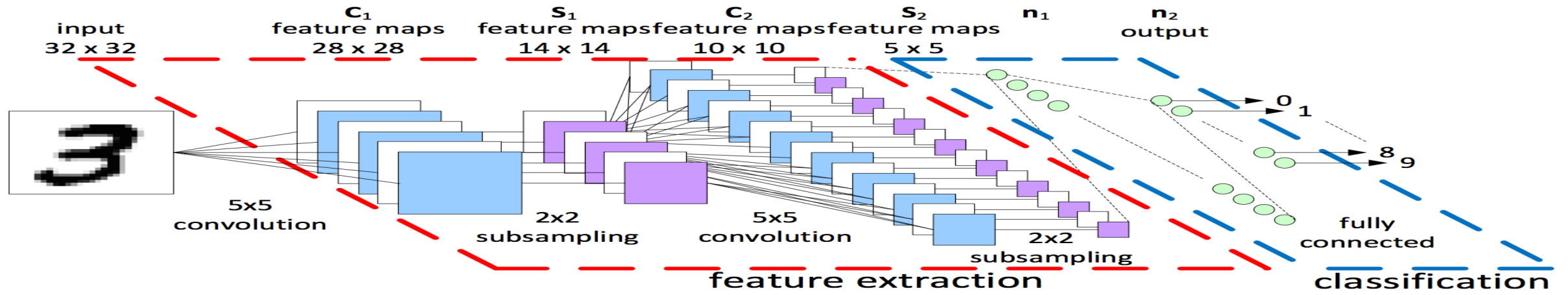
# MNIST Convolution NN



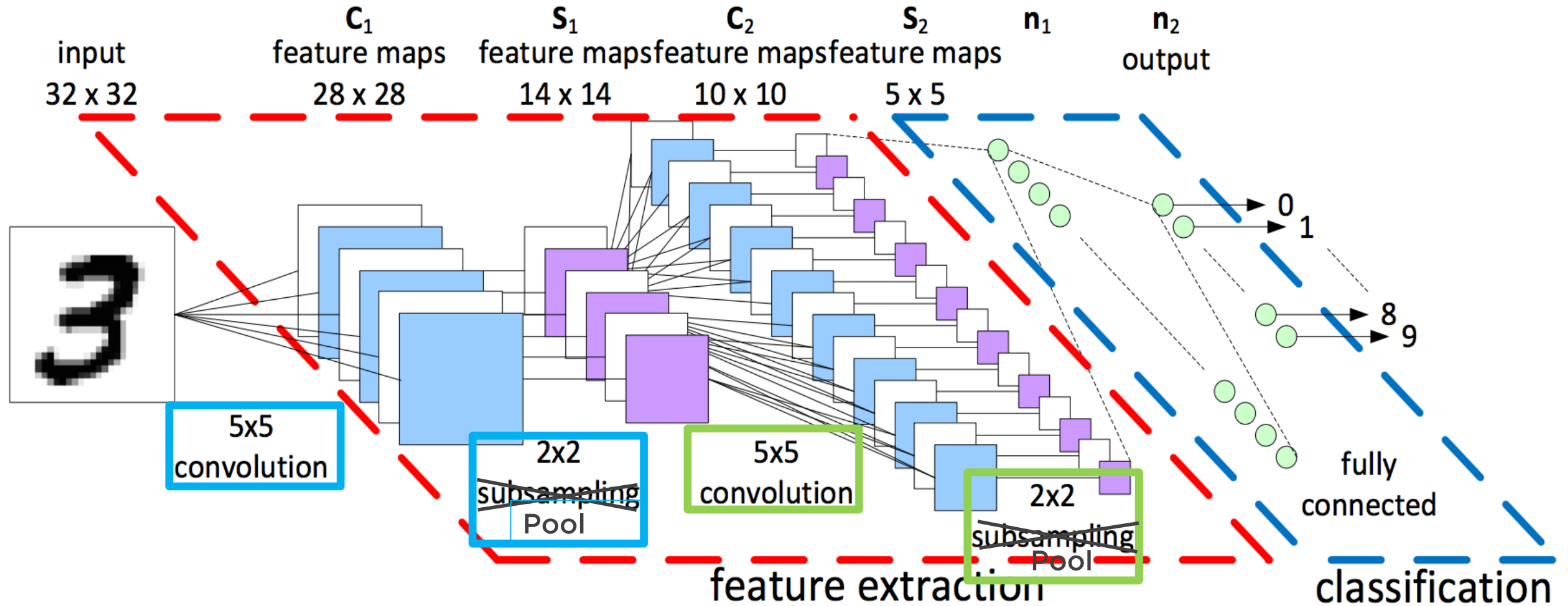
# MNIST Convolution NN



# Deep MNIST Convolution NN



# Implementation of Convolutional NN



# Deep MNIST Convolutional Neural Network Code

Sue

Ramon

Clair



Automatic Captioning

Security

Product Inspection

Object Detection for Vehicles



# Working with Text

“I really love this place. The food was passible and the service was glacial. But the lights are pretty and tables cloths impressive.”

Customer 72

# Sentiment Analysis

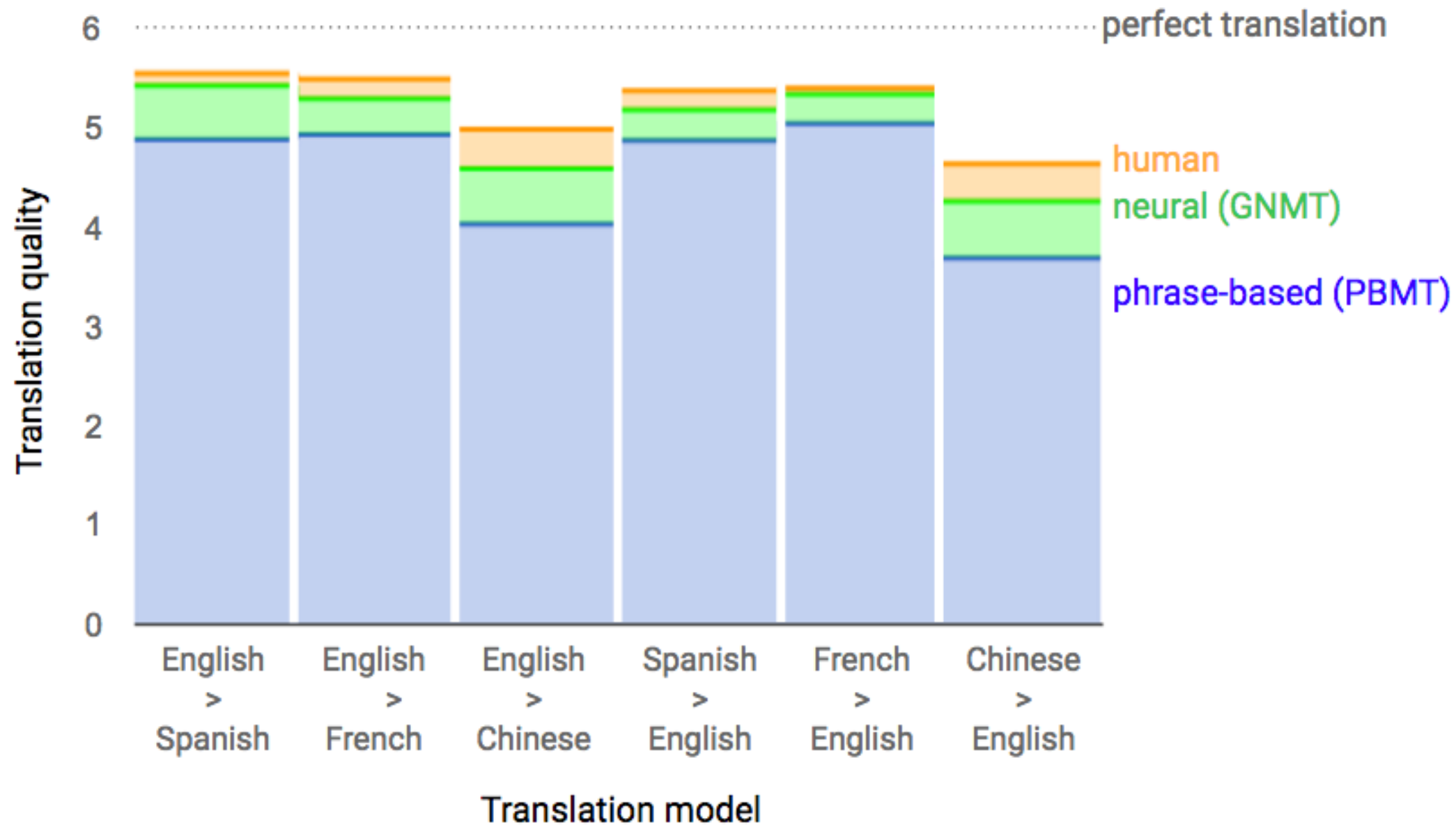
“I really **love** this place. The food was passible and the service was glacial. But the lights are **pretty** and tables cloths **impressive**.”

Customer 72

# Translation



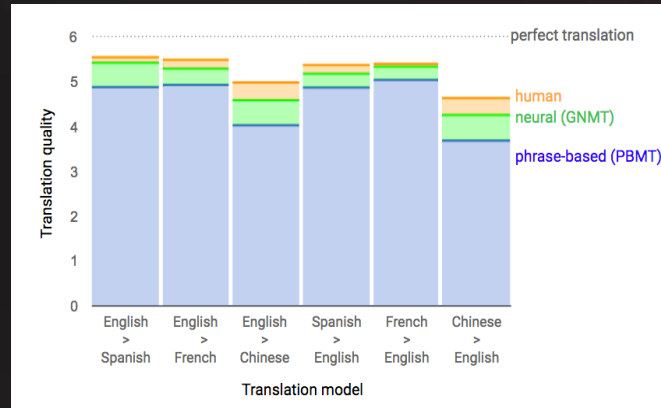
Customer Interaction in  
their native language



# Translation



Customer Interaction in  
their native language



High Quality Translation



Image Translation

A vertical bar on the left side of the slide with a gradient from orange at the top to pink at the bottom.

“AI is future ... for all humankind.”

...

“Whoever becomes the leader in this sphere will become the ruler of the world.”

Vladimir Putin, President of Russia

THANK YOU

