Artificial Intelligence with TensorFlow

Drive your data further

Artificial Intelligence with TensorFlow is a three-week, part-time, online bootcamp that offers an advanced look at what neural networks, deep learning, machine learning and artificial intelligence are and what they can do for businesses. This immersive, hands-on course teaches students the data science tools and technologies needed to build and test neural networks in TensorFlow using real-world data. The work learned in this course can be applied to businesses to help attendees reduce operational costs, grow revenue, increase efficiency and improve customer experience.

Who should attend?
Data analysts, economists, researchers, software, data engineers or data managers who want to deepen their understanding of artificial intelligence and neural networks

Key Concepts Covered
TensorFlow, iterative algorithms, neural networks, overfitting, adversarial noise, variational autoencoders, estimators, datasets

Prerequisites
To achieve the greatest benefit from this course, attendees must take Essential Data Tools and Practical Machine Learning or possess the following skills prior to attending:

- Intermediate Python
- Linear algebra
- Statistical modeling

Register for AI with TensorFlow or learn more about other courses in our data curriculum by visiting pragmaticinstitute.com or calling 480.515.1411.
What Students Learn

Over the course of three weeks, attendees get hands-on experience with TensorFlow and utilize real-world data to gain skills that can be used the next day.

**WEEK 1**

**STUDENTS ARE INTRODUCED TO TENSORFLOW**, begin building simple iterative algorithms and practice multiple types of programs and tools.

- Introduction to TensorFlow
  - The computational graph
  - Exercise: implementing a basic graph
  - Tensor: data types and shapes
  - Exercise: reducing tensors of arbitrary shape
  - Graphs, sessions, TensorBoard
- Iterative algorithms
  - Archimedes’ algorithm
  - Exercise: Fibonacci numbers
  - Newton’s method of root finding
  - Exercise: minimizing functions of two variables

**WEEK 2**

**STUDENTS BEGIN ASSEMBLING NEURAL NETWORKS** out of linear models, and basic networks are expanded into deep networks.

- Basic neural networks
  - The XOR problem
  - Hidden layers
  - Exercise: number of hidden neurons
  - Activation functions
  - Exercise: exploring activation functions
  - Exercise: adding a hidden layer
- Deep neural networks
  - What is deep learning?
  - Multilayer perceptron
  - Layer API
  - Overfitting and dropout
  - Exercise: adding flexibility
  - Exercise: adding dropout
  - Exercise: changing the learning rate

**WEEK 3**

**STUDENTS LEARN A NUMBER OF TOPICS** related to convolutional networks, variational autoencoders and recurrent architecture for neural networks.

- Convolutional networks
  - Exercise: improving network architecture
- Adversarial noise
  - How do you find adversarial noise?
  - Putting it all together
  - Exercise: extending immunity
- DeepDream and the inception model variational autoencoders
  - Autoencoders
  - Encoder and decoder
  - KL-divergence
  - Adam optimizer
  - Exercise: the influence of loss functions
- Recurrent neural networks
  - Backpropagation through time
  - Long-short term memory
  - Generating strata abstracts

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