



PLURALSIGHT

Introduction to Artificial Intelligence

Welcome!



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About Me:

- Lead Data Scientist for Storyblocks
- Teaching Programming and Data Science related topics for the last 5 years
- I live in Utah & love getting out in the Wasatch Mountains as much as I can

Prerequisites

This course assumes you

- Know basics of python programming
- Have previous exposure to ML concepts

Please note:

If you have never programmed before or if you've only used Bash, Powershell, SQL or similar, this is probably not the right class for you.

Please chat me so we can get you to the right resource.

Why should we care about AI?

Who's using it?



Source:

<https://bootstraplabs.com/artificial-intelligence/applied-artificial-intelligence-conference-2017/>

Why study this subject?

- To enhance your understanding of Artificial Intelligence
- Get hands-on experience working with AI in a project
- So that you can better work with AI products within Intuit

We teach over 400 technology topics.



You experience our impact on a daily basis!



My pledge to you:

I will..

- Make this course interactive
- Ask you questions
- Ensure everyone can speak
- Create an inclusive learning environment
- Use an on-screen timer for breaks

...also, if you have an accessibility need, please let me know!

Classroom Expectations

You will..

- Be on time for class
- Make sure your video is turned on and set yourself to mute
- Participate in class exercises
- Ask Questions
- Have fun!

Objectives

At the end of this course, you will be able to:

- Describe what artificial intelligence is and how it can be used in business applications
- Identify the different agents and search mechanisms and their specific uses
- Use AI in the completion of a capstone project

Agenda

- Today:
 - Intro to the course
 - The language of AI: understanding terminology
 - ML Review (Overview)
- The rest of the week:
 - Deep Learning with Neural Networks
 - Reinforcement Learning
 - Applications and Capstone Project



Today's Schedule

9:00 - 9:30 am PT Course Kickoff:

- Introductions
- Managing your digital classroom
- Course Layout

Break 9:50 - 10:00 am PT

9:30 - 11:15 am PT Intro to Artificial Intelligence

11:15 - 12:00 pm PT Tech Check

Lunch 12:00 - 1 PM PT

1:00 - 2:50 PM PT Review Supervised Learning I (Regression)

- Lecture
- Lab

Break 2:50 - 3:00 pm PT

3:00 - 5:00 PM PT Review Supervised Learning II (Classification)

- Lecture
- Lab

How we're going to work together

- You'll have a copy of the course materials shortly
 - We'll be using Jupyter notebooks (explained shortly)
- You'll be following along in the notebook and..
 - doing coding exercises/labs inside the notebook as well



Student Instructions

HELLO
my name is

Your name?
**And preferred
pronouns?**

- Job title?
- Where are you based?
- What is your related experience, if any?
- Fun fact?

Today's Key Learning Objectives

- Define AI and differentiate between broad and narrow AI
- Identify areas of the business that could benefit from or already use AI
- Refresh our understanding of Supervised and unsupervised learning
- Be able to build some example ML models in python

What is Artificial Intelligence?

There's certainly a lot of hype around “AI”

A college kid's fake, AI-generated blog fooled tens of thousands. This is how he made it.

“It was super easy actually,” he says, “which was the scary part.”

Robots Inform Artificial Intelligence Researchers That They'll Take It From Here

Cleaning ROBOT that can tell jokes is being trialled on hospital wards to 'put a smile on patients' faces' and help in the fight against Covid-19

Why it will be years before robot butlers take over your household chores



CAUSES THOUSANDS OF DOLLARS WORTH OF DAMAGE



AI Creates False Documents That Fake Out Hackers

The algorithm hides sensitive information in a sea of decoys

Watch: AI camera mistakes referee's bald head for ball, follows it through the match

Owing to the Covid-19 pandemic, the Inverness club had announced its decision to refrain using human camera operators and instead rely on an automated camera system to follow the action.



What does AI mean to you?

Which type of AI?

Artificial Intelligence

Applied Artificial
Intelligence



General Artificial
Intelligence



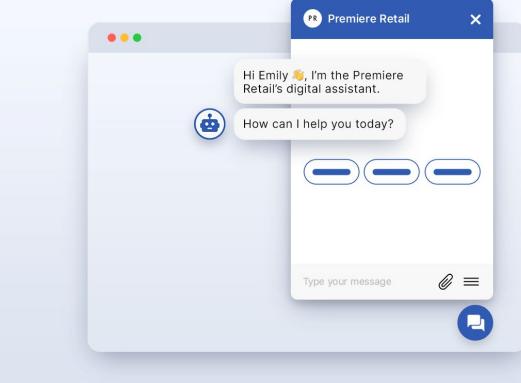
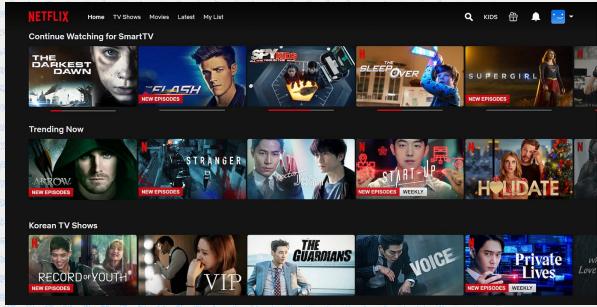
Artificial Intelligence

The ability of a computer system to deal with ambiguity, by making predictions using previously gathered data, and learning from errors in those predictions in order to generate newer, more accurate predictions about how to behave in the future



What are some examples of AI in everyday life?

AI is ubiquitous today



Group Exercise: 5 Minutes



Take those examples from before and classify them into Broad or Narrow AI

Narrow VS Broad AI

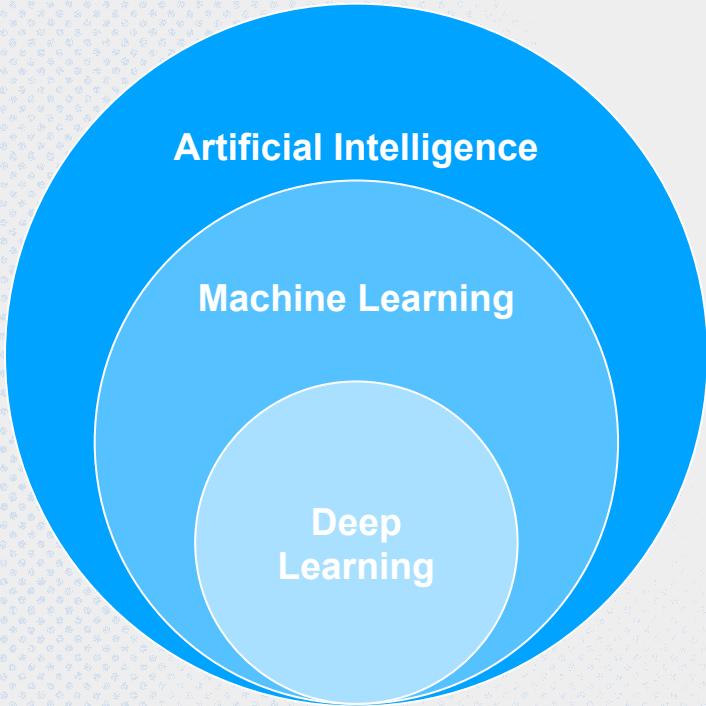
Narrow AI:

- Already exists
- Less than human level intelligence
- Really good at focused set of tasks
- Also called “weak AI”
- Self-driving vehicles
- Digital Assistants
- Game AI

Broad AI:

- Doesn’t exist yet
- Human level (or better) intelligence
- Able to perform unseen tasks very well
- Also called “General AI”
- Think Sci-fi movies e.g. C-3PO, HAL, Smarthouse, I, Robot, etc.

Buzzwords Galore!



Artificial Intelligence

Teaching machines to behave like humans

Machine Learning

A model that learns to do one task and improves with more data (i.e. examples).

Deep Learning

Branch of Machine Learning that can handle many nuances and challenging data (e.g. text, image)

Machine Learning Terminology

Supervised Learning

- Labeled Data
- Use training data, X , to predict a response variable, y
- Make predictions on new data where we don't know y

Unsupervised Learning

- No labeled data to work with
- Extracts structure from the data
- Attempts to represent that structure in a smaller feature set

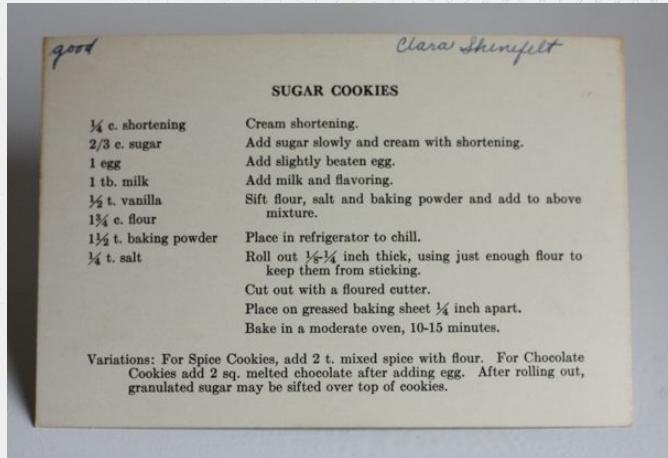
Reinforcement Learning

- Can learn as it goes in real time
- Doesn't require historical training data
- Explores more options to come to the optimal solution

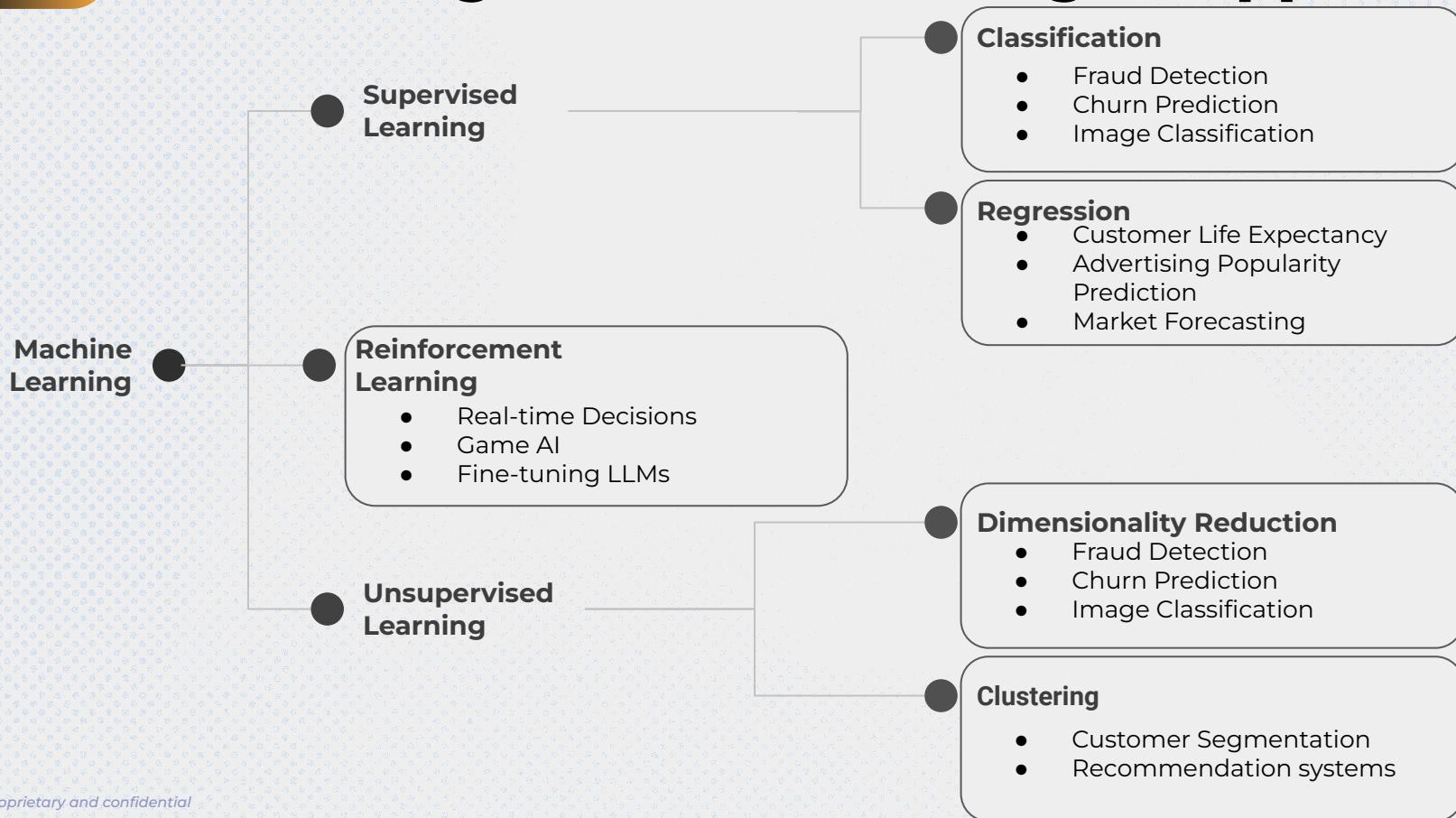
We do this using Algorithms

Algorithm: a process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer

It's like a recipe. We'll see various algorithms used to build models we can then use for various machine learning tasks like prediction or clustering



Translating Machine Learning to Applications



Supervised: Classification vs. Regression

Regression

- Outcome variable is continuous
- Can you think of an example?



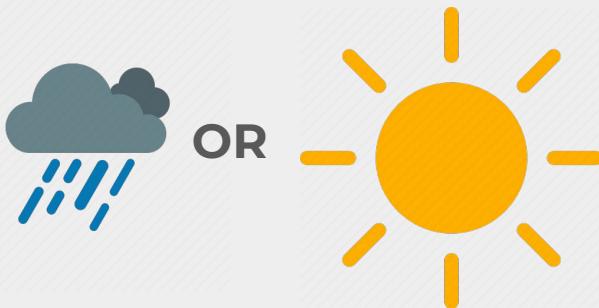
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4

Classification

- Outcome variable is categorical
- Can you think of an example?

Classification

Will it rain tomorrow?



Regression

How much will it rain?



Unsupervised: Clustering & Dimensionality Reduction

Common Types of Unsupervised Learning:

- **Clustering:** Groups *similar* data points together
- **Dimensionality Reduction:** Reduce the dimensionality of a data set by extracting features that capture most of the variance in the data

Examples:

- Customer Segmentation, “More Movies Like this”
- Image Compression

Group Exercise: 5 Minutes



What are some ways Intuit is using AI or could be using it?

AI and ML Applications at Intuit

Fraud/Bad-Actor Detection:

- Model type: xgboost, trees
- Where: Login page, payment, etc
- Common issue: Imbalanced data set

Multi-class classification:

- Matching customers to experts
- Document extraction classifier
- Categorizing small business transactions
- Caller ID based on Vocal Patterns

Conversational Experience (chatbots):

- Digital Assistants in Turbotax and Quickbooks
- Answer product questions, resolve issues, and connect to a person to assist
- Used RNNs (Bert++) for conversation understanding, but moving to LLMs from OpenAI et al

Group Exercise: 5 Minutes



**For each example, tell me
which type of learning it is
(supervised, unsupervised or
reinforcement)**

Tech Check: 45 Minutes



Let's ensure you're ready to access the course materials



git



zoom

We're using python, but AI is developed in many languages





Jupyter – Notebook Environment

Popular open-source application for creating and sharing documents that contain code, text, images, data visualizations, and equations.

Notebooks are heavily used by data scientists when developing machine learning and AI applications before those models are put into production.

We'll be using jupyter in class for lecture and labs going forward.

Git & github – Version Control and Collaboration



Git is a tool for version control and collaboration. In class we'll be using it to clone repositories that contain the course lessons and labs.

Github will be where we host remote versions of the lessons and labs for you to copy to your local machines.

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Questions?

Thank you!

If you have any additional questions, please ask! If

