Applied Natural Language Processing in EdTech

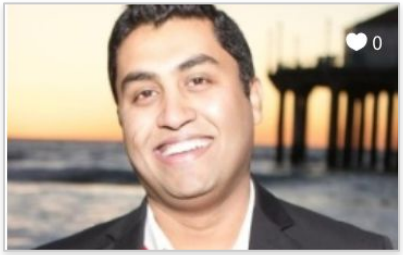
What are we covering

- Meet your Instructors and Support Team
- What is Applied Machine Learning
- Problem Statement
- Module 1 Exploratory Data Analysis
- Module 2 Feature Extraction and Classification
- Module 3 Deep Learning Classification
- Conclusion

Meet your instructors and support team

Robert Pugh
Senior Natural Language Processing Engineer

David Alyea
Senior Data Scientist



John D'Souza
Senior Machine Learning Engineer

What is Applied Machine Learning?

Problem Definition	Problem Description
	Gather Data
	Motivation
	Manual Solution
Analyze Data	Summarize Data
	Visualize Data
Prepare Data	Select Data
	Process Data
	Transform Data
Evaluate Algorithm	Test harness
	Explore and select algorithms
	Interpret and report results
Improve Results	Algorithm Tuning
	Ensemble Methods
	Feature Tuning
Present Results	Productionize Algorithm

Credit: vaidilv/Data-Science--Cheat-Sheet

Applied ML in Education

- **Question Answering**
- Question Generation
- Automatic Assessment
- **Academic document tagging**
- **Identifying difficulty level of questions**
- Personalized and Adaptive learning
- **Study tools**
- Assessment creation
- Intelligent tutoring

Problem Statement

Given a question, we want to predict the type of answer it elicits. For example, a question like

```
Who was the first prime minister of Canada?
```

is eliciting the name of a **human**, whereas a question like

```
How do you peel a hard-boiled egg?
```

requires an answer that is a **description** of a process.

This task has proven to be quite useful in the area of Information Retrieval-based question-answering, since it allows you to significantly narrow down the space of possible answers.

Question Answer Classification Labels

- Abbreviation (abbreviation, expression)
  - “What does S.O.S. stand for?”
- Entity (e.g. animal, event, product, etc.)
  - “What fowl grabs the spotlight after the Chinese Year of the Monkey?”
- Description (e.g. definition, manner, etc.)
  - “What is paracetamol?”
- Human (e.g. individual, group, etc)
  - “What was the name of the first Russian astronaut to do a spacewalk?”
- Location (e.g. city, country, etc)
  - “Which two states enclose Chesapeake Bay?”
- Numeric (e.g. count, date, distance, etc.)
  - “How many points make up a perfect fivepin bowling score?”

Getting Started - How to engage with us

Please go to
https://github.com/coursehero/ai-odsc-workshop-2019

- Follow set-up instructions in README...3 set up options:
  - 1) Local (virtual environment recommended)
  - 2) Mybinder
  - 3) Colab

When you have Questions, just…
raise your hand

or
wave to a person in a Course Hero shirt

Here we go…