Deep Learning for Machine Translation

Lecture # 0

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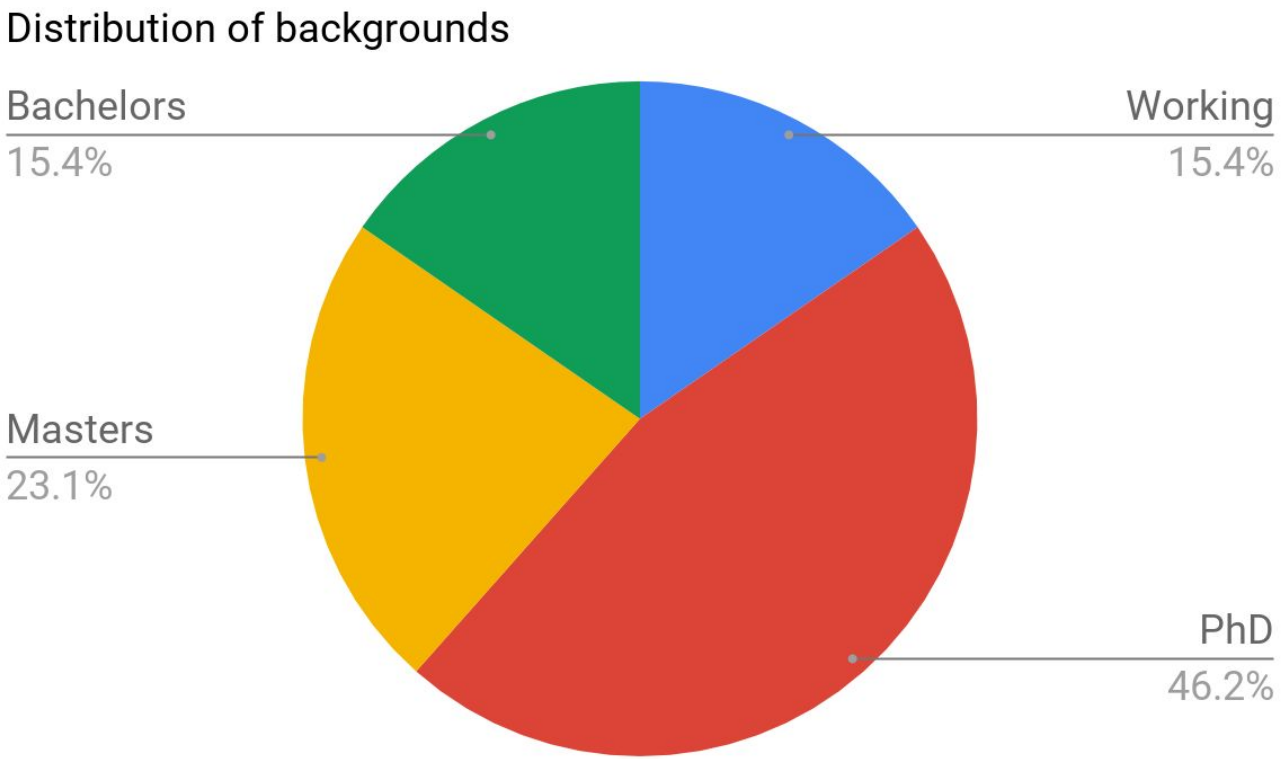
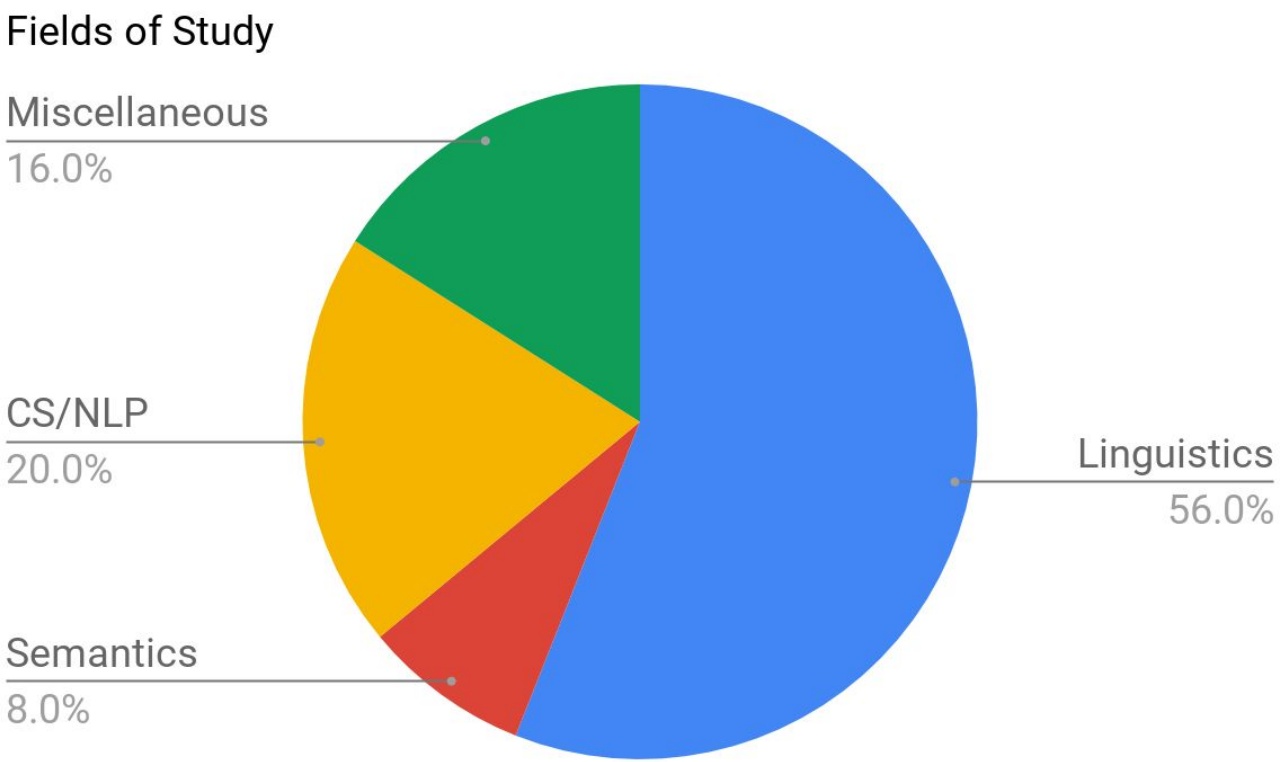
Who are we?

- Research Scientist and Software Engineer
- Background: Computer Science
- Primary focus area: Machine translation

To Know you Better!



To Know you Better!



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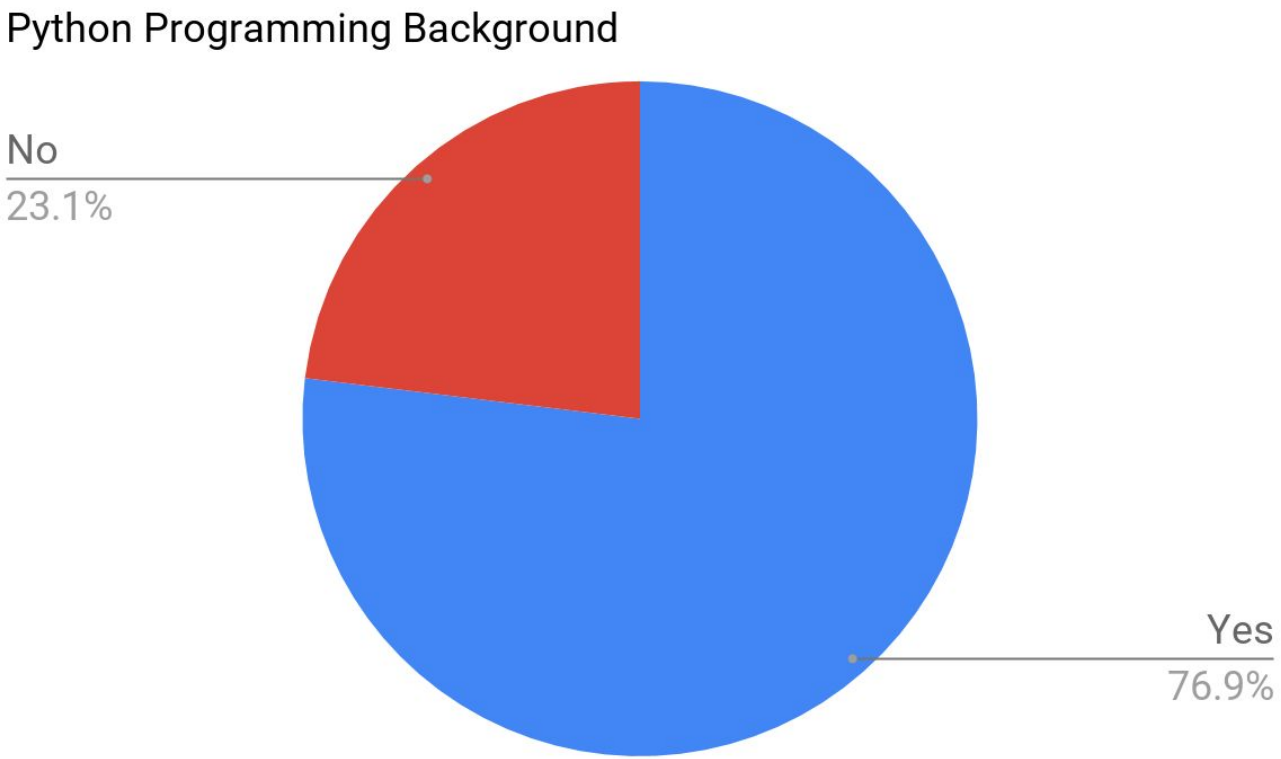

To Know you Better!

Do you know about:

- language models?
- statistical machine translation?

Expectation from the Course

- Theoretical
  - by the end of this course, you know about language models, basics of machine learning, neural networks, and neural machine translation
- Practical
  - you will be able to build neural network models using python
  - you will know how to train a neural machine translation system

Road Map

- Prerequisites
  - Python
  - linear algebra

- Lecture 1 - Introduction to language and translation
  - basic concepts about languages
  - ingredients of an automatic translation system
    - parallel corpora, word alignment, evaluation, etc.

Road Map

- Lecture 2 - Language Modeling
  - ngrams
  - count-based language modeling
  - evaluation
  - smoothing

- Lecture 3 - Machine Learning
  - linear classification
  - components of a learning framework
  - optimization

Road Map

- Lecture 4 - Machine Learning and Neural Networks
  - backpropagation
  - implement a classifier
  - multiclass classification
  - softmax linear classifier
  - intro to neural networks

Road Map

- Lecture 5 - Neural Networks
  - efficient softmax classifier
  - deep dive into neural networks
  - implementation of a neural network

- Lecture 6 - Neural Network Language Models
  - language model as a classification problem
  - word embeddings
  - implementation
  - recurrent neural network

Road Map

- Lecture 7 - Sequence to Sequence
  - bilingual language model
  - encoder-decoder architecture
  - attention mechanism
  - word representations

Road Map

- Lecture 8 - Practical Neural MT
  - Adding Monolingual data
  - Multidomain fine-tuning
  - Ensemble
  - Residual
  - Toolkits

Road Map

- Lecture 9 - Analysis of Neural MT

- Lecture 10 - Latest and Greatest
  - multilingual NMT
  - zero-shot translation
  - multi-modal and multi-task

Answers to your Questions