# UMass · CS685 | Advanced Natural Language Processing (2020)

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# Final projects

## CS 685, Fall 2020

Advanced Natural Language Processing
http://people.cs.umass.edu/~miyyer/cs685/

## Mohit Iyyer

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University of Massachusetts Amherst

# Timeline

- All groups will be formed by *Sep 7*
- Only two deliverables:
  - **Project proposal**: 2-4 pages, due *Sep 21*
  - **Final report**: 12+ pages, due *Dec 4*

- Almost completely open-ended!
  - All projects must involve natural language data
  - All projects should include at least some degree of model implementation

# Project

- Either *build* natural language processing systems, or *apply* them for some task.
- Use or develop a dataset. Report empirical results or analyses with it.
- Different possible areas of focus
  - Implementation & development of algorithms
  - Defining a new task or applying a linguistic formalism
  - Exploring a dataset or task

# Formulating a proposal

- What is the ***research question***?
- What's been done before?
- What experiments will you do?
- How will you know whether it worked?
    - If data: held-out accuracy
    - If no data: manual evaluation of system output. Or, annotate new data

Feel free to be ambitious (in fact, we explicitly encourage creative ideas)!  Your project doesn't necessarily have to "work" to get a good grade.

# The Heilmeier Catechism

- What are you trying to do? Articulate your objectives using absolutely no jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- What are the mid-term and final "exams" to check for success?

https://en.wikipedia.org/wiki/George_H._Heilmeier#Heilmeier.27s_Catechism

# An example proposal

- Introduction / problem statement
- Motivation (why should we care? why is this problem interesting?)
- Literature review (what has prev. been done?)
- Possible datasets
- Evaluation
- Tools and resources
- Project milestones / tentative schedule

# NLP Research

- All the best publications in NLP are open access!
  - Conference proceedings: ACL, EMNLP, NAACL (EACL, LREC...)
  - Journals: TACL, CL
  - "aclweb": ACL Anthology-hosted papers http://aclweb.org/anthology/
  - NLP-related work appears in other journals/conferences too: data mining (KDD), machine learning (ICML, NIPS), AI (AAAI), information retrieval (SIGIR, CIKM), social sciences (Text as Data), etc.
- Reading tips
  - Google Scholar
    - Find papers
    - See paper's number of citations (imperfect but useful correlate of paper quality) and what later papers cite it
    - [... or SemanticScholar...]
  - For topic X: search e.g. [[nlp X]], [[aclweb X]], [[acl X]], [[X research]]...
  - Authors' webpages
    find researchers who are good at writing and whose work you like
  - Misc. NLP research reading tips:
    http://idibon.com/top-nlp-conferences-journals/

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  - e.g. Urban Dictionary

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# Sources of data

- All projects must use (or make, and use) a textual dataset.  Many possibilities.
    - For some projects, creating the dataset may be a large portion of the work; for others, just download and more work on the system/modeling side

- SemEval and CoNLL Shared Tasks:
  dozens of datasets/tasks with labeled NLP annotations
    - Sentiment, NER, Coreference, Textual Similarity, Syntactic Parsing, Discourse Parsing, and many other things...
    - e.g. SemEval 2015 ... CoNLL Shared Task 2015 ...
    - https://en.wikipedia.org/wiki/SemEval (many per year)
    - http://ifarm.nl/signll/conll/ (one per year)

- General text data  (not necessarily task specific)
    - Books (e.g. Project Gutenberg)
    - Reviews  (e.g. Yelp Academic Dataset https://www.yelp.com/academic_dataset)
    - Web
    - Tweets

# Tools

- Tagging, parsing, NER, coref, ...
  - Stanford CoreNLP http://nlp.stanford.edu/software/corenlp.shtml
  - spaCy (English-only, no coref) http://spacy.io/
  - Twitter-specific tools (ARK, GATE)
- Many other tools and resources
  *tools* ... word segmentation ... morph analyzers ...
  *resources* ... pronunciation dictionaries ... wordnet, word embeddings, word clusters ...
- Long list of NLP resources
  https://medium.com/@joshdotai/a-curated-list-of-speech-and-natural-language-processing-resources-4d89f94c032a
- Deep learning? Try out AllenNLP, PyTorch, Tensorflow (https://allennlp.org, https://pytorch.org/, https://www.tensorflow.org/)

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