Final projects

CS 685, Fall 2020
Advanced Natural Language Processing
http://people.cs.umass.edu/~miyyer/cs685/

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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/
A few examples

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  • Sarcasm and humor detection
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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, ...
- spaCy (English-only, no coref) [http://spacy.io/](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](https://medium.com/@joshdotai/a-curated-list-of-speech-and-natural-language-processing-resources-4d89f94c032a)