A Fun and Engaging Interface for Crowdsourcing Named Entities

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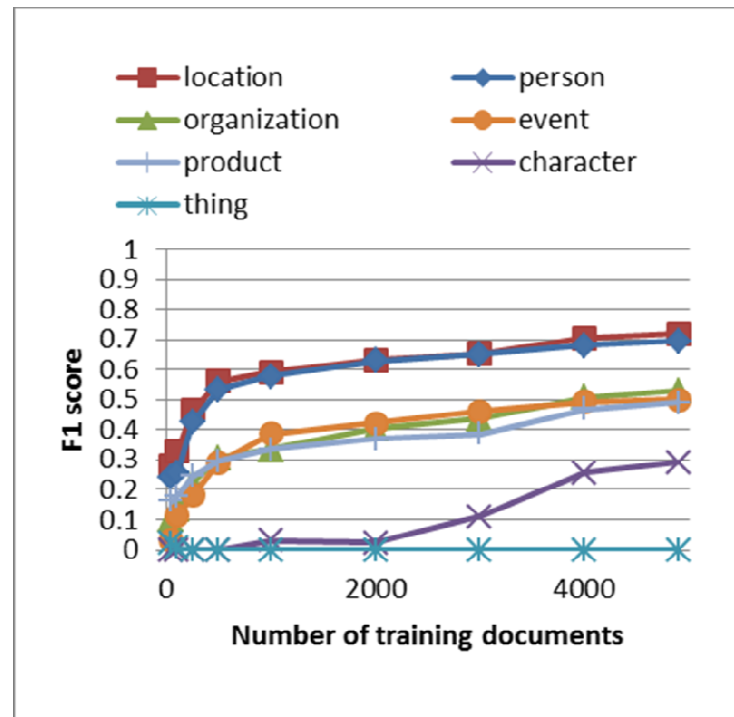MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Named Entity Recognition (NER)

- **Automatically extract named mentions of entities from natural language text**

- **Ontology of named entity types**
  - **Person**
  - **Organization**
  - **Location**
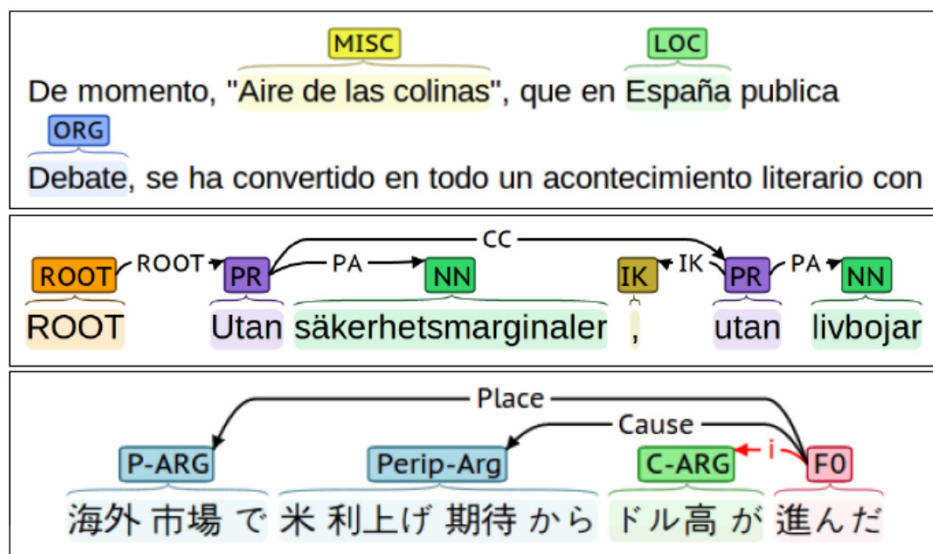
Don't NER Corpora Already Exist?

- **Domain adaptation is still a huge problem**
  - **New genre**
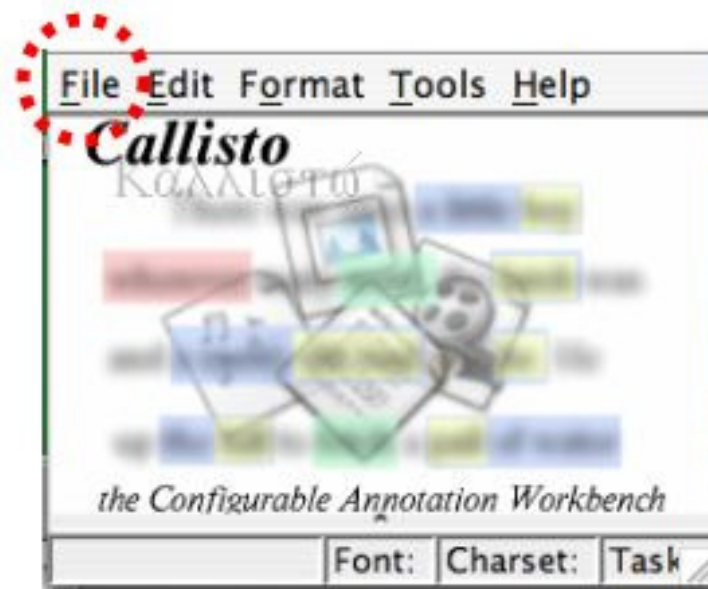 - **New language**
  - **New ontology**

Standard NER Annotation Tools

- **Applicable to many tasks, not just NER**

- **Require linguistic knowledge**

- **Designed for experts**

BRAT Rapid Annotation Tool
(Stenetorp, et al., 2012)

Callisto
(MITRE, 2013)

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Early NER Crowdsourcing Interfaces

- **Easy for the researcher to create human intelligence tasks**

- **Difficult for the worker to read the passage**

- **Limited to short spans of text**

- **Requires the worker to annotate multiple entity types simultaneously**

Twitter NER Annotation System

(Finin et al, 2010)

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Early NER Crowdsourcing Interfaces

- **Allows worker to annotate an entire entity mention at once instead of word by word**

- **Presents document in a more natural way**

- **Interface helps workers to distinguish named mentions from nominals at the expense of slightly more work**

Span-based NER Annotation

(Lawson et al, 2010)

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MITLL NER Annotation Interface

- **Make it easy for the worker to accurately complete the task**

- **Recognize when the worker didn't accurately complete the task**

- **Make the worker want to complete additional HITs**

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Help the Workers

- **Minimize the effort that a worker must go through to annotate a document**

- **Minimize the mental burden on a worker**

Clear Instructions Matter

- **The use of a small set of pilot experiments to tune the examples included in the instructions greatly eliminated requests for clarification in further runs**

- **Quickly responding to worker requests for clarification resulted in workers completing tasks accurately and completing more HITs**

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De-incentivizing Spam Workers

- **Workers who annotate too little**
  - **Financial**: incentive based pay structure where the monetary reward increases with the number of annotations (Lawson et. Al. 2010)
  - **Psychological**:
    - Asking workers who didn't annotate anything on a HIT if they were sure there were no entity mentions
    - Threats of lowered approval ratings

- **Workers who annotate too much**
  - **Psychological**:
    - Threats of lowered approval ratings

Identifying Worker Fatigue
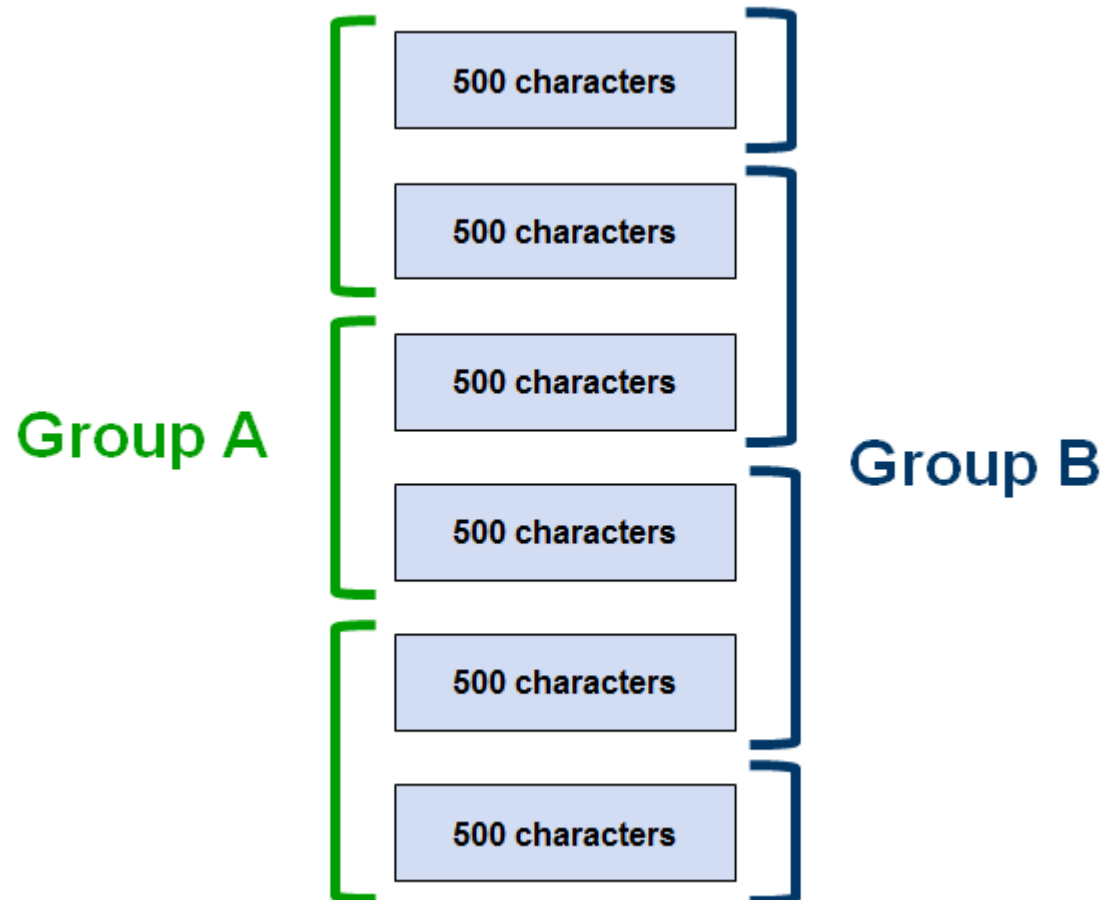
- **Compared the responses of a worker who was less likely to be fatigued with one who was more likely to be fatigued**

- **Document sizes based on preliminary experimentation with time workers took to complete a HIT and not ending documents mid-sentence**

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Identifying Worker Fatigue

- **Compare workers who may be fatigued to automated system output using MITIE (MIT Information Extraction system)**

- **Used a third worker to verify that system false positives (as compared to the first 2 workers) were in fact false positives**

- Make it easy for the worker to accurately complete the task

- Recognize when the worker didn't accurately complete the task

- **Make the worker want to complete additional HITs**

Easy to Use Interface

- **An easy to use interface can overpower a lack of strong financial incentives**

Morning :) Just some friendly advice :)
I have done about 140 of your hits. I really like the names ones.
I am guessing your account is a new, based on the # of reviews it has on the workers Turkopticon sight. I also noticed that it seems like your batches are not really being worked as fast as you likely hope, and I wanted to offer some advice on that. Though I really enjoy your hits (and the interface I must say is really fantastic! Kudos!), the pay does leave something to be desired.

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Conclusions

- **Strongest motivator seems to be an implicit threat of lowered approval ratings**

- **Most workers with high approval ratings didn't suddenly switch to deliberately performing poorly on our task, but did sometimes make honest mistakes due to fatigue or lack of comprehension**

- **An easy to use interface can be a stronger motivational factor than financial incentives**

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Future Work

- **More rigorously determine the relationship between financial incentives and ease of use incentives**

- **Develop similar easy to use interfaces for more complicated annotation tasks**

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