Project

Requirements

- You are going to explore something new (could be reproduction study)
- Max 5 pages ACL style files: `https://github.com/acl-org/acl-style-files`
- Bibliography and appendix do not count
- Result should be close to a publishable paper!

Requirements

- You should focus on Named Entity Recognition (NER) or Relation Extraction (RE)
- You can pick one of the topics proposed by us, or propose your own
- If you plan to propose your own topic, get in touch with Rob
- Every group is required to implement a Baseline; for NER we'll use the EWT, for RE we'll use CrossRE

Requirements

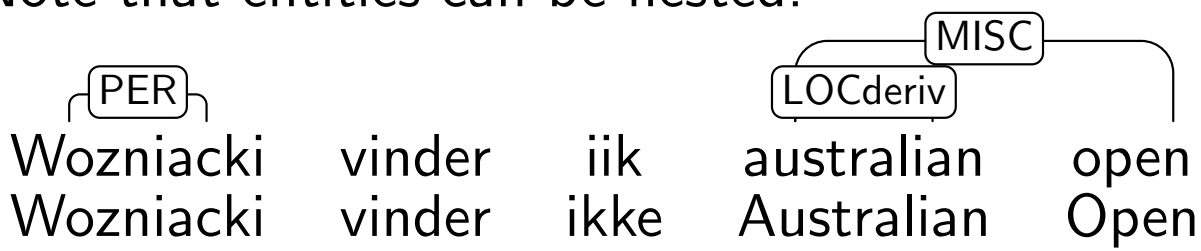
- More advanced than most-frequent class (O)
- Could be viterbi, CNN, LSTM, BERT, etc.
- For one of the projects, a machine learning classifier could be the best fit
- Solution to week 5 assignments will be posted, so code from week 3, 5 and 6 can be used as a starting point

Requirements

NER task:

Barack	Obama	was	born	in	Hawaii
B-PER	I-PER	O	O	O	B-LOC

Note that entities can be nested:



Requirements

IT	University	of	Copenhagen
B-ORG	I-ORG	I-ORG	I-ORG
O	O	O	B-LOC

Datasets

- EWT: https://aclanthology.org/2021.findings-acl.158.pdf
- Tweebank: https://aclanthology.org/2022.lrec-1.780.pdf
- DaN+: https://aclanthology.org/2020.coling-main.583.pdf
- CrossNER: https://ojs.aaai.org/index.php/AAAI/article/view/17587/17394
- WikiAnn, MultiCoNER II: Use with caution (silver data!)

Datasets

Varieties:

Name	Langs	Domains	Nested	Human	# labels
EWT	EN	5 web	Y	Y	12
Tweebank	EN	Social	N	Y	4
DaN+	DA	News,Social	Y	Y	12
CrossNER	EN	5 wiki	N	Y	39
WikiAnn	295	wiki	N	N	3
MultiCoNER II	12	wiki	N	N	33

Datasets

If these are insufficient for your research question: find another or make one!

Project ideas

Project ideas

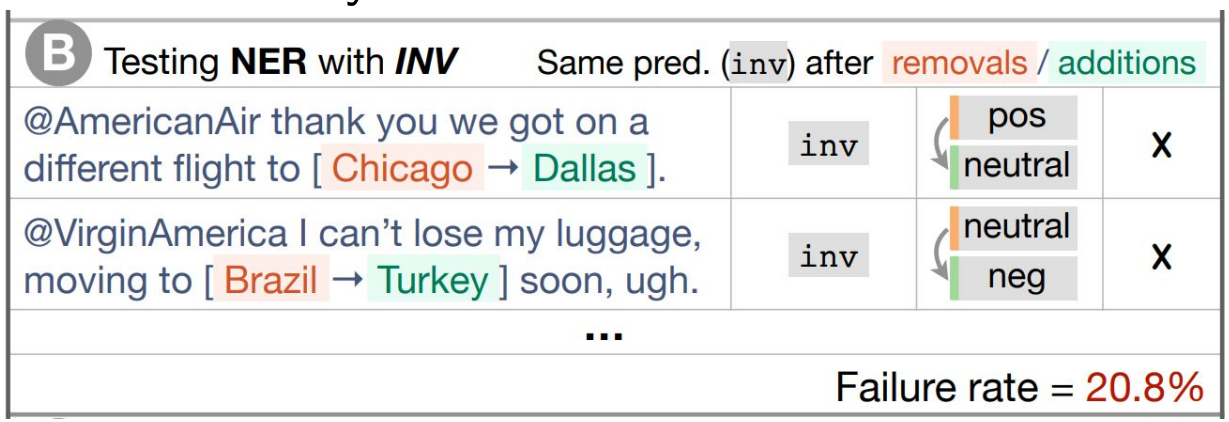
Can we improve NER systems?

- Might be hard
- Find challenging situations to focus on
- Incorporate POS tags?

Project ideas

Checklist evaluation

- Checklists have been proposed to do controlled evaluation of classification systems:

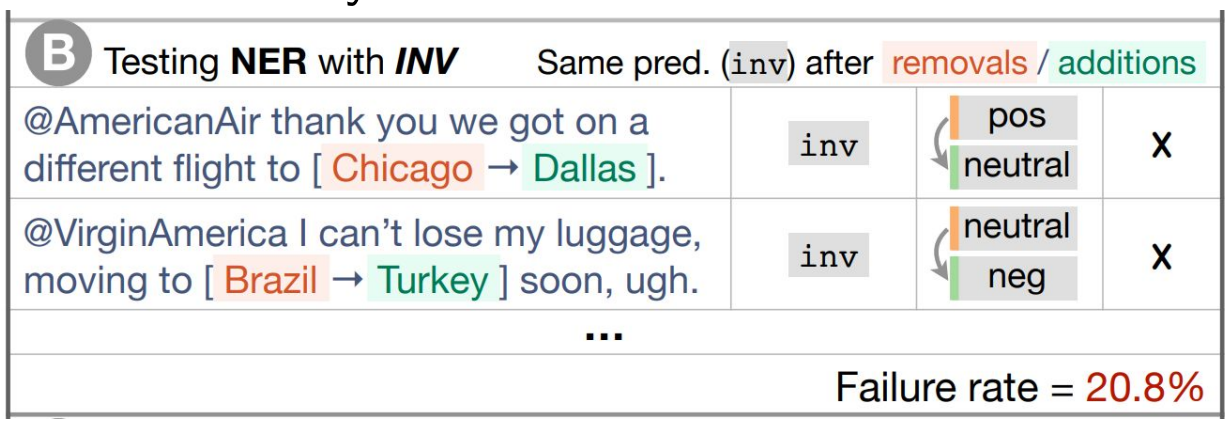


- `https://aclanthology.org/2020.acl-main.442.pdf`

Project ideas

Checklist evaluation

- Checklists have been proposed to do controlled evaluation of classification systems:



- `https://aclanthology.org/2020.acl-main.442.pdf`
- Can they be used for span-based tasks?

Project ideas

Cross-dataset NER (language/domain)

- How to exploit the strengths of multiple datasets for NER?
- They have different amounts of qualitaty and different annotation guidelines

Project ideas

NER for new language/domain

- I.E.: Can we build an NE tagger for Frisian social media data?
- Annotate a small dev/test set, transfer from other train set(s)
- Evaluate existing model(s)

Project ideas

Quality check of silver (or gold) data

- Re-annotate existing data
- Find difficult cases for humans, do they overlap with the difficult cases for automatic systems?

Project ideas

Emerging NEs

- Most datasets have overlapping entities between train and test splits
- Performance is much lower if these are separated (40%)
- How can we overcome this gap?
  - gazeteers
  - data augmentation
  - pre-training?
  - self-training?

Project ideas

Unsupervised NER

- Remove the assumption of training data
- Start with easy cases, bootstrap from there
- Capitalization or embeddings spaces can be used for example

Project ideas

Active learning for spans

- Active learning = human-in-the-loop
- Automatically select new batch of training samples to annotate after every N annotations.
- `https://aclanthology.org/W15-1511.pdf`
- Propose to use SVM for POS tagging, and focus only on ambiguous cases.
- For NER, the ambiguity problem is less important, but the labels have to be in the correct order!
  - I would suggest to ignore BIO labels, and add them post-hoc

Project ideas

How to do nested NER

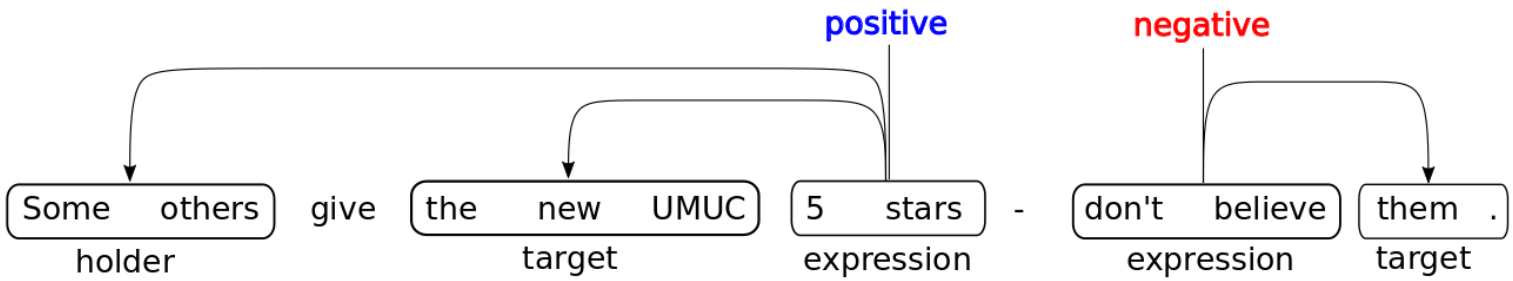
- Nested NER has a different structure as a task
- The second layer has much lower scores (`https://aclanthology.org/2020.coling-main.583.pdf` table 5)
- Hard to improve, as they are scarce!

Project ideas

For the ambitious: Relation Extraction

Project ideas

Relation extraction as sequence labeling



Project ideas

Pipeline versus sequence labeling

- Identify spans (span-labeling)
- Binary identification of relations
- Labeling of relations

vs.

- Convert task to sequence labeling

Project ideas