

Title (EN): Domain-Specific NER Adaptation

In the past years, the Named Entity Recognition (NER) technology has been under an active development and enjoy a significant increase in popularity and usage in the academic and industrial sphere. Nevertheless, vast majority of the developed NER systems have been developed as general-purpose systems. While they can perform well on multiple domains (macro level), on specific domains (micro level) their performance quality might be low. The ultimate goal of the thesis is to develop domain-specific NER models. Guidelines:

- Get familiar with the NER technology and available NER frameworks.
- Investigate possible datasets for domain-specific training of NER.
- Develop NER training datasets for several selected domains (e.g. sports, politics, music, etc.).
- Train a domain-specific NER model using existing frameworks, such as DBpedia Spotlight or StanfordNER.
- Validate and evaluate the developed domain-specific NER models.



**FACULTY
OF INFORMATION
TECHNOLOGY
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Master's thesis

Domain-specific Name Entity Recognition

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May 15, 2018

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I would like to thank my family and friends for support during writing this thesis.

Declaration

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In Prague on May 15, 2018

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Czech Technical University in Prague

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Abstrakt

Klíčová slova

Abstract

Keywords

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Introduction

Motivation

Goals of the thesis

The main goal of the thesis is to show (test) does extracting information from a global domain gives us better results than extracting information from a specific domain, for example politics domain or any other domain.

Thesis outline

Background and related work

1.1 Information extraction

information extraction, that is, automatically building a relational database from information contained in unstructured text. Unlike linear-chain models, general CRFs can capture long distance dependencies between labels.

1.2 NER

NER is the problem of identifying and classifying proper names in text, including locations, such as China; people, such as George Bush; and organizations, such as the United Nations. The named-entity recognition task is, given a sentence, first to segment which words are part of entities, and then to classify each entity by type (person, organization, location, and so on). The challenge of this problem is that many named entities are too rare to appear even in a large training set, and therefore the system must identify them based only on context

1.3 RDF/NIF

1.4 DBpedia ontology

<http://wiki.dbpedia.org/services-resources/ontology> <http://mappings.dbpedia.org/server/ontology/class>

1.5 Evaluation/training datasets

1.6 Domain specific NER

<https://arxiv.org/pdf/1612.00148.pdf>

1.7 Stanford NER

Domain specific NER

There are parameters of the computer used for tests shown in Table ??.

2.1 Data pre-processing

• Coarse grained • Fine grained

2.2 Types retrieval

At the main file where we write text we retrieve all types that are available for that text. After that, that text is processed with coarse and fine grained types. In coarse grained we have politics, sport and transportation specific domains. In fine grained in politics domain we retrieve in total 26 types (write them all), which we sort in 11 more specific types like for example Ambassador, Mayor, Deputy etc. are fused in one specific domain Politician. We do the same for sport domain where we retrieve in total 171 types, so those types, same as politics domain, are specified in 8 types, like SportClub, SportsLeague, SportsTeam, Athlete, Coach, OrganizationMember, SportsManager, SportsEvent. We also do the same for transportation domain, where we retrieve in total 78 types and minimized in 14 more specific types like Aircraft, Automobile, Locomotive, MilitaryVehicle, Motorcycle, On-SiteTransportation, Rocket, Ship, SpaceShuttle, SpaceStation, Spacecraft, Train, PublicTransitSystem and Infrastructure.

2.3 Domain specification

• How we choose those domains (Politics, Sport, Transportation)?

2.4 Data transformation/output for Stanford

â€” How we process data to be ready to use on Stanford NER system?

Experiments

We have provide various types of experiments. In next sections we will discuss more about every provided experiment.

3.1 Goals of the experiments

We set a few goals of the experiments. First of all we waned to test does we will get better results if we run the model of all domains in coarse grained, against the model of all domains in fine grained. In this test we run the models also with all domains texts. Then we get those models and we run it with specific domain texts, in both fine and coarse grained. Also we make experiments with specific domain model runned with domain specific texts, for example, politics domain model in coarse grained is runned with politics domain text also annotated in coarse grained, politics domain model in fine grained is runned with politics domain text also annotated in fine grained, and the same for sport and transportation domains.

3.2 List of experiments

Make it like experiment - discussion

```
CRFClassifier tagged 4307 words in 1 documents at 5867,85 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 1,0000  0,0299  0,0580  2       0       65
SPORT 0,5000  0,0127  0,0247  1       1       78
TRANSPORTATION 1,0000  0,2857  0,4444  4       0       10
Totals 0,8750  0,0438  0,0833  7       1       153

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksCoarseGrained.ser.gz -testFile texts\All3DomainsBBCCoar
seGrainedSpecified.tsv
```

Figure 3.1: All 3 Domains Coarse BBC Coarse

3. EXPERIMENTS

```
CRFClassifier tagged 10336 words in 1 documents at 6764,40 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9655  0,9333  0,9492  28      1      2
SPORT    1,0000  1,0000  1,0000  15      0      0
TRANSPORTATION 1,0000  1,0000  1,0000  9       0      0
Totals   0,9811  0,9630  0,9720  52      1      2

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op10Links\All3DomainsTop10LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.2: All 3 Domains Coarse Top 10 Links

```
CRFClassifier tagged 4504 words in 1 documents at 5118,18 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9655  0,3636  0,5283  28      1     49
Totals   0,9655  0,3636  0,5283  28      1     49

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op10Links\PoliticsCoarseGrainedTop10Links.tsv
```

Figure 3.3: All 3 Domains Coarse Top 10 Links Politics

```
CRFClassifier tagged 2854 words in 1 documents at 4298,19 words per second.
Entity P      R      F1      TP      FP      FN
SPORT    1,0000  1,0000  1,0000  15      0      0
Totals   1,0000  1,0000  1,0000  15      0      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op10Links\SportCoarseGrainedTop10Links.tsv
```

Figure 3.4: All 3 Domains Coarse Top 10 Links Sport

3.2.1 Top 10 Links

In this experiment we get the model that is trained with all 3 domains together with coarse grained and we make an experiment with the text that is trained, that means text from all 3 domains annotated with coarse grained. Here we have for every domain 10 abstracts, so in total 30 annotated abstracts. This is our smallest model. How we can see from the picture in politics domain F1 value is lower than in sport and transportation. This results with lower F1 value in total, but still that is very satisfying value, because we have only 1 false positive and 2 false negative words.

In this experiment we get the previous trained model and test with politics coarse grained text. Result is not satisfying, because we have a very low recall, so that results with bad F1 value and very big false negative words. We can clearly say that this is not the model that we want to use in annotating. With those results we can say that all 3 domains together with all text perform better results than all 3 domain model tested with specified domain.

Then we get the same model, and like previous, we tested with sport coarse grained text. So how we can see from the picture, we have perfect result, there is no false positive or false negative words, there are only true positive which results with F1 value of 1.000 (no lost words).

Finally we tested this model with our last domain, transportation domain with coarse grained text. Because of very small annotated words we have

3.2. List of experiments

```
CRFClassifier tagged 2978 words in 1 documents at 4532,72 words per second.
Entity P      R      F1      TP      FP      FN
TRANSPORTATION 1,0000  1,0000  1,0000  9       0       0
Totals 1,0000  1,0000  1,0000  9       0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op10Links\TransportationCoarseGrainedTop10Links.tsv
```

Figure 3.5: All 3 Domains Coarse Top 10 Links Transportation

```
CRFClassifier tagged 10336 words in 1 documents at 3395,53 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  1       0       0
Athlete 1,0000  1,0000  1,0000  1       0       0
Coach 1,0000  1,0000  1,0000  1       0       0
PoliticalParty 0,9600  0,9231  0,9412  24      1       2
Politician 1,0000  1,0000  1,0000  4       0       0
PublicTransitSystem 1,0000  1,0000  1,0000  7       0       0
Ship 1,0000  1,0000  1,0000  1       0       0
SportsClub 1,0000  1,0000  1,0000  7       0       0
SportsEvent 1,0000  1,0000  1,0000  1       0       0
SportsLeague 1,0000  1,0000  1,0000  4       0       0
SportsTeam 1,0000  1,0000  1,0000  1       0       0
Totals 0,9811  0,9630  0,9720  52      1       2

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10
Links\All3DomainsTop10LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.6: All 3 Domains Fine Top 10 Links

```
CRFClassifier tagged 4504 words in 1 documents at 2861,50 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000  0,0000  0,0000  0       0       15
PoliticalParty 0,9600  0,9231  0,9412  24      1       2
Politician 1,0000  0,1111  0,2000  4       0       32
Totals 0,9655  0,3636  0,5283  28      1       49

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10
Links\PoliticsFineGrainedTop10Links.tsv
```

Figure 3.7: All 3 Domains Fine Top 10 Links Politics

again perfect results without any false positive or false negative words, same as previous test, there are only true positive matches, which is what we want.

After we finish testing of all 3 domains trained with coarse grained texts, we move on with new type of experiment, model that contains all our domains and is trained with fine grained texts. We run the same experiment like in coarse grained, but now text is annotated with fine grained. So, in such small trained model is not surprising that we get the same results as in experiment with coarse grained annotated text.

We have repeated the same experiments from previous, but now with fine grained annotation. So we tested our model with politics domain annotated in fine grained and we get exactly the same results like in coarse grained. In this case there is no difference if we use coarse or fine grained trained model, because the results are same.

The sport domain text annotated in fine grained provide also same result as coarse grained annotated domain.

Same as sport domain, the transportation domain Figure 3.9 text annotated with fine grained, provide also same results.

3. EXPERIMENTS

```
CRFClassifier tagged 2854 words in 1 documents at 2548,21 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 1,0000 1,0000 1       0       0
Coach 1,0000 1,0000 1,0000 1       0       0
SportsClub 1,0000 1,0000 1,0000 7       0       0
SportsEvent 1,0000 1,0000 1,0000 1       0       0
SportsLeague 1,0000 1,0000 1,0000 4       0       0
SportsTeam 1,0000 1,0000 1,0000 1       0       0
Totals 1,0000 1,0000 1,0000 15      0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10
Links\SportFineGrainedTop10Links.tsv
```

Figure 3.8: All 3 Domains Fine Top 10 Links Sport

```
CRFClassifier tagged 2978 words in 1 documents at 2538,79 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 1       0       0
PublicTransitSystem 1,0000 1,0000 1,0000 7       0       0
Ship 1,0000 1,0000 1,0000 1       0       0
Totals 1,0000 1,0000 1,0000 9       0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10
Links\TransportationFineGrainedTop10Links.tsv
```

Figure 3.9: All 3 Domains Fine Top 10 Links Transportation

```
CRFClassifier tagged 4504 words in 1 documents at 5941,95 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9737 0,9610 0,9673 74      2       3
Totals 0,9737 0,9610 0,9673 74      2       3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-PoliticsTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top10
Links\PoliticsCoarseGrainedTop10Links.tsv
```

Figure 3.10: Politics Coarse Top 10 Links Politics

After experimenting with models that are trained with all domains together, we move on with experiments where we create specific models, both coarse and fine grained. First we tested the model that is created with politics text annotated in coarse grained. How we can see from Figure 3.10 we have a better results than that experiment that we provide in all 3 domains. The F1 value is very big which is the results of low false positive and false negative annotated words.

We also provide the same experiment like previous, but now the model is annotated in fine grained. From Figure 3.11 is clearly that we have improve our model, here the F1 value is bigger that in coarse grained (see Figure 3.10) and also false positive annotated words are decreased by 1. That means even we have a complete review of our entities and can see the precision of each entity, this domain, in total, is more precise that coarse grained model and all 3 domains in coarse and fine grained. From here, with this small amount of data we can say that it's better to use a politics specific domain, in fine grained, than a global domain, because in global domain we have 28 words annotated as true positive, but in a politics specific coarse grained domain we have 74 words annotated as true positive, which is very big difference, if we want to be precise.

We repeated the experiment for sport specific domain, but in this case the

3.2. List of experiments

```
CRFClassifier tagged 4504 words in 1 documents at 3568,94 words per second.
Entity P      R      F1      TP      FP      FN
Election 1,0000 0,9333 0,9655 14      0      1
PoliticalParty 0,9600 0,9231 0,9412 24      1      2
Politician 1,0000 1,0000 1,0000 36      0      0
Totals 0,9867 0,9610 0,9737 74      1      3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-PoliticsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\
PoliticsFineGrainedTop10Links.tsv
```

Figure 3.11: Politics Fine Top 10 Links Politics

```
CRFClassifier tagged 2854 words in 1 documents at 4920,69 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 1,0000 1,0000 1,0000 15      0      0
Totals 1,0000 1,0000 1,0000 15      0      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-SportTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\
SportCoarseGrainedTop10Links.tsv
```

Figure 3.12: Sport Coarse Top 10 Links Sport

```
CRFClassifier tagged 2854 words in 1 documents at 2525,66 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 1,0000 1,0000 1      0      0
Coach 1,0000 1,0000 1,0000 1      0      0
SportsClub 1,0000 1,0000 1,0000 7      0      0
SportsEvent 1,0000 1,0000 1,0000 1      0      0
SportsLeague 1,0000 1,0000 1,0000 4      0      0
SportsTeam 1,0000 1,0000 1,0000 1      0      0
Totals 1,0000 1,0000 1,0000 15      0      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-SportTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\
SportFineGrainedTop10Links.tsv
```

Figure 3.13: Sport Fine Top 10 Links Sport

results are exactly the same in coarse and fine grained (see Figure 3.12 and Figure 3.13 as well as in all 3 domains also in coarse and fine grained

This model is really small, only 15 annotated words, that's because we cannot make a conclusion which model is better to use. But if we speak about performance, of coarse the better solution is specified domain.

The transportation model, like a sport domain, is also a very small, only 9 annotated words. We provide the experiments for coarse grained (see Figure 3.14) and we get same results as in all 3 domains (see Figure 3.9). Same is happening for the fine grained domain (see Figure 3.15). In such a small trained domain, we cannot clearly say which model is better to use.

```
CRFClassifier tagged 2978 words in 1 documents at 2951,44 words per second.
Entity P      R      F1      TP      FP      FN
TRANSPORTATION 1,0000 1,0000 1,0000 9      0      0
Totals 1,0000 1,0000 1,0000 9      0      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-TransportationTop10LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\
Top10Links\TransportationCoarseGrainedTop10Links.tsv
```

Figure 3.14: Transportation Coarse Top 10 Links Transportation

3. EXPERIMENTS

```
CRFClassifier tagged 2978 words in 1 documents at 3063,79 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 1       0       0
PublicTransitSystem 1,0000 1,0000 1,0000 7       0       0
Ship 1,0000 1,0000 1,0000 1       0       0
Totals 1,0000 1,0000 1,0000 9       0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top10Links\ner-TransportationTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\To
p10Links\TransportationFineGrainedTop10Links.tsv
```

Figure 3.15: Transportation Fine Top 10 Links Transportation

```
CRFClassifier tagged 18733 words in 1 documents at 6802,11 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 1,0000 0,9615 0,9804 50      0       2
SPORT 1,0000 1,0000 1,0000 27      0       0
TRANSPORTATION 1,0000 1,0000 1,0000 12      0       0
Totals 1,0000 0,9780 0,9889 89      0       2

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op20Links\All3DomainsTop20LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.16: All 3 Domains Coarse Top 20 Links

```
CRFClassifier tagged 7218 words in 1 documents at 5710,44 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 1,0000 0,3906 0,5618 50      0       78
Totals 1,0000 0,3906 0,5618 50      0       78

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op20Links\PoliticsCoarseGrainedTop20Links.tsv
```

Figure 3.17: All 3 Domains Coarse Top 20 Links Politics

3.2.2 Top 20 Links

In subsection 3.2.1 we provide various experiments with different models. Now in this subsection we will repeat those experiments, but now we doubled the number of text to every domain, so we have 20 abstracts for every domain, in total 60 abstract. Those models, like previous, are trained in both coarse grained and fine grained.

3.2.3 Top 40 Links

TEXT

TEXT

TEXT

TEXT

TEXT

```
CRFClassifier tagged 6810 words in 1 documents at 5198,47 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 1,0000 1,0000 1,0000 26      0       0
Totals 1,0000 1,0000 1,0000 26      0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op20Links\SportCoarseGrainedTop20Links.tsv
```

Figure 3.18: All 3 Domains Coarse Top 20 Links Sport

3.2. List of experiments

```
CRFClassifier tagged 4705 words in 1 documents at 5535,29 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,0000  1,0000  0,0000  0       1       0
TRANSPORTATION 1,0000  1,0000  1,0000  12      0       0
Totals 0,9231  1,0000  0,9600  12      1       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op20Links\TransportationCoarseGrainedTop20Links.tsv
```

Figure 3.19: All 3 Domains Coarse Top 20 Links Transportation

```
CRFClassifier tagged 18733 words in 1 documents at 2912,47 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  0,5000  0,6667  1       0       1
Athlete 1,0000  1,0000  1,0000  1       0       0
Coach 1,0000  1,0000  1,0000  1       0       0
Infrastructure 1,0000  0,5000  0,6667  1       0       1
PoliticalParty 1,0000  0,9512  0,9750  39      0       2
Politician 1,0000  1,0000  1,0000  11      0       0
Ship 1,0000  1,0000  1,0000  1       0       0
SpaceShuttle 1,0000  1,0000  1,0000  6       0       0
SpaceStation 1,0000  1,0000  1,0000  1       0       0
SportsClub 1,0000  1,0000  1,0000  10      0       0
SportsEvent 1,0000  1,0000  1,0000  1       0       0
SportsLeague 1,0000  1,0000  1,0000  12      0       0
SportsTeam 1,0000  1,0000  1,0000  2       0       0
Totals 1,0000  0,9560  0,9775  87      0       4

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top20
Links\All3DomainsTop20LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.20: All 3 Domains Fine Top 20 Links

```
CRFClassifier tagged 7218 words in 1 documents at 2440,99 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000  0,0000  0,0000  0       0       32
PoliticalParty 1,0000  0,9512  0,9750  39      0       2
Politician 1,0000  0,2000  0,3333  11      0       44
Totals 1,0000  0,3906  0,5618  50      0       78

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top20
Links\PoliticsFineGrainedTop20Links.tsv
```

Figure 3.21: All 3 Domains Fine Top 20 Links Politics

```
CRFClassifier tagged 6810 words in 1 documents at 2508,29 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000  1,0000  1,0000  1       0       0
Coach 1,0000  1,0000  1,0000  1       0       0
SportsClub 1,0000  1,0000  1,0000  10      0       0
SportsEvent 1,0000  1,0000  1,0000  1       0       0
SportsLeague 1,0000  1,0000  1,0000  12      0       0
SportsTeam 1,0000  1,0000  1,0000  1       0       0
Totals 1,0000  1,0000  1,0000  26      0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top20
Links\SportFineGrainedTop20Links.tsv
```

Figure 3.22: All 3 Domains Fine Top 20 Links Sport

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```
CRFClassifier tagged 4705 words in 1 documents at 2180,26 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 0,5000 0,6667 1       0       1
Infrastructure 1,0000 0,5000 0,6667 1       0       1
Ship 1,0000 1,0000 1,0000 1       0       0
SpaceShuttle 1,0000 1,0000 1,0000 6       0       0
SpaceStation 1,0000 1,0000 1,0000 1       0       0
SportsTeam 0,0000 1,0000 0,0000 0       1       0
Totals 0,9091 0,8333 0,8696 10      1       2

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-All3DomainsTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top20
Links\TransportationFineGrainedTop20Links.tsv
```

Figure 3.23: All 3 Domains Fine Top 20 Links Transportation

```
CRFClassifier tagged 7218 words in 1 documents at 4903,53 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9921 0,9766 0,9843 125     1       3
Totals 0,9921 0,9766 0,9843 125     1       3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-PoliticsTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top20
Links\PoliticsCoarseGrainedTop20Links.tsv
```

Figure 3.24: Politics Coarse Top 20 Links Politics

```
CRFClassifier tagged 7218 words in 1 documents at 6153,45 words per second.
Entity P      R      F1      TP      FP      FN
Election 1,0000 0,9688 0,9841 31      0       1
PoliticalParty 1,0000 0,9512 0,9750 39      0       2
Politician 1,0000 1,0000 1,0000 55      0       0
Totals 1,0000 0,9766 0,9881 125     0       3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-PoliticsTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top20Lin
ks\PoliticsFineGrainedTop20Links.tsv
```

Figure 3.25: Politics Fine Top 20 Links Politics

```
CRFClassifier tagged 6810 words in 1 documents at 6418,47 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 1,0000 1,0000 1,0000 26      0       0
Totals 1,0000 1,0000 1,0000 26      0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-SportTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top20Li
nks\SportCoarseGrainedTop20Links.tsv
```

Figure 3.26: Politics Coarse Top 20 Links Politics

```
CRFClassifier tagged 6810 words in 1 documents at 4518,91 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 1,0000 1,0000 1       0       0
Coach 1,0000 1,0000 1,0000 1       0       0
SportsClub 1,0000 1,0000 1,0000 10      0       0
SportsEvent 1,0000 1,0000 1,0000 1       0       0
SportsLeague 1,0000 1,0000 1,0000 12      0       0
SportsTeam 1,0000 1,0000 1,0000 1       0       0
Totals 1,0000 1,0000 1,0000 26      0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-SportTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top20Links
\SportFineGrainedTop20Links.tsv
```

Figure 3.27: Sport Fine Top 20 Links Sport

```
CRFClassifier tagged 4705 words in 1 documents at 5439,31 words per second.
Entity P      R      F1      TP      FP      FN
TRANSPORTATION 1,0000 0,8333 0,9091 10      0       2
Totals 1,0000 0,8333 0,9091 10      0       2

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-TransportationTop20LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top20Links\TransportationCoarseGrainedTop20Links.tsv
```

Figure 3.28: Politics Coarse Top 20 Links Politics

3.2. List of experiments

```
CRFClassifier tagged 4705 words in 1 documents at 5032,09 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 0,5000 0,6667 1       0       1
Infrastructure 1,0000 0,5000 0,6667 1       0       1
Ship 1,0000 1,0000 1,0000 1       0       0
SpaceShuttle 1,0000 1,0000 1,0000 6       0       0
SpaceStation 0,0000 0,0000 0,0000 0       0       1
Totals 1,0000 0,7500 0,8571 9       0       3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top20Links\ner-TransportationTop20LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
20Links\TransportationFineGrainedTop20Links.tsv
```

Figure 3.29: Sport Fine Top 20 Links Sport

```
CRFClassifier tagged 42657 words in 1 documents at 7408,30 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9890 0,9375 0,9626 90      1       6
SPORT 1,0000 1,0000 1,0000 93      0       0
TRANSPORTATION 1,0000 0,9846 0,9922 64      0       1
Totals 0,9960 0,9724 0,9841 247     1       7

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op40Links\All3DomainsTop40LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.30: All 3 Domains Coarse Top 40 Links

```
CRFClassifier tagged 17912 words in 1 documents at 6553,97 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9890 0,3529 0,5202 90      1      165
Totals 0,9890 0,3529 0,5202 90      1      165

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op40Links\PoliticsCoarseGrainedTop40Links.tsv
```

Figure 3.31: All 3 Domains Coarse Top 40 Links Politics

```
CRFClassifier tagged 13802 words in 1 documents at 6470,70 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 1,0000 1,0000 1,0000 91      0       0
Totals 1,0000 1,0000 1,0000 91      0       0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op40Links\SportCoarseGrainedTop40Links.tsv
```

Figure 3.32: All 3 Domains Coarse Top 40 Links Sport

```
CRFClassifier tagged 10943 words in 1 documents at 6560,55 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,0000 1,0000 0,0000 0       2       0
TRANSPORTATION 1,0000 0,9846 0,9922 64      0       1
Totals 0,9697 0,9846 0,9771 64      2       1

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\T
op40Links\TransportationCoarseGrainedTop40Links.tsv
```

Figure 3.33: All 3 Domains Coarse Top 40 Links Transportation

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```
CRFClassifier tagged 42657 words in 1 documents at 4228,07 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 16      0      0
Athlete 1,0000 1,0000 1,0000 8       0      0
Coach 1,0000 1,0000 1,0000 1       0      0
Infrastructure 1,0000 1,0000 1,0000 14      0      0
PoliticalParty 0,9863 0,9730 0,9796 72      1      2
Politician 1,0000 0,8182 0,9000 18      0      4
PublicTransitSystem 1,0000 1,0000 1,0000 27      0      0
Ship 1,0000 1,0000 1,0000 1       0      0
SpaceShuttle 1,0000 1,0000 1,0000 6       0      0
SpaceStation 1,0000 1,0000 1,0000 1       0      0
SportsClub 1,0000 1,0000 1,0000 20      0      0
SportsEvent 1,0000 1,0000 1,0000 29      0      0
SportsLeague 1,0000 1,0000 1,0000 23      0      0
SportsTeam 1,0000 1,0000 1,0000 12      0      0
Totals 0,9960 0,9764 0,9861 248      1      6

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
Links\All3DomainsTop40LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.34: All 3 Domains Fine Top 40 Links

```
CRFClassifier tagged 17912 words in 1 documents at 3556,79 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0       0      66
PoliticalParty 0,9863 0,9730 0,9796 72      1      2
Politician 1,0000 0,1565 0,2707 18      0      97
Totals 0,9890 0,3529 0,5202 90      1      165

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
Links\PoliticsFineGrainedTop40Links.tsv
```

Figure 3.35: All 3 Domains Fine Top 40 Links Politics

```
CRFClassifier tagged 13802 words in 1 documents at 3215,75 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 1,0000 1,0000 8       0      0
Coach 1,0000 1,0000 1,0000 1       0      0
SportsClub 1,0000 1,0000 1,0000 19      0      0
SportsEvent 1,0000 1,0000 1,0000 29      0      0
SportsLeague 1,0000 1,0000 1,0000 23      0      0
SportsTeam 1,0000 1,0000 1,0000 11      0      0
Totals 1,0000 1,0000 1,0000 91      0      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
Links\SportFineGrainedTop40Links.tsv
```

Figure 3.36: All 3 Domains Fine Top 40 Links Sport

TEXT
TEXT
TEXT
TEXT
TEXT
TEXT

3.2.4 Top 100 Links

TEXT
TEXT
TEXT
TEXT
TEXT

3.2. List of experiments

```
CRFClassifier tagged 10943 words in 1 documents at 3228,02 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  16      0      0
Infrastructure 1,0000  1,0000  1,0000  14      0      0
PublicTransitSystem 1,0000  1,0000  1,0000  27      0      0
Ship 1,0000  1,0000  1,0000  1      0      0
SpaceShuttle 1,0000  1,0000  1,0000  6      0      0
SpaceStation 1,0000  1,0000  1,0000  1      0      0
SportsClub 0,0000  1,0000  0,0000  0      1      0
SportsTeam 0,0000  1,0000  0,0000  0      1      0
Totals 0,9701  1,0000  0,9848  65      2      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-All3DomainsTop40LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
Links\TransportationFineGrainedTop40Links.tsv
```

Figure 3.37: All 3 Domains Fine Top 40 Links Transportation

```
CRFClassifier tagged 17912 words in 1 documents at 6014,78 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9921  0,9804  0,9862  250     2      5
Totals 0,9921  0,9804  0,9862  250     2      5

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-PoliticsTop40LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
Links\PoliticsCoarseGrainedTop40Links.tsv
```

Figure 3.38: Politics Coarse Top 40 Links Politics

```
CRFClassifier tagged 17912 words in 1 documents at 6014,78 words per second.
Entity P      R      F1      TP      FP      FN
Election 1,0000  0,9848  0,9924  65      0      1
PoliticalParty 0,9863  0,9730  0,9796  72      1      2
Politician 1,0000  1,0000  1,0000  115     0      0
Totals 0,9960  0,9882  0,9921  252     1      3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-PoliticsTop40LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top40Li
ks\PoliticsFineGrainedTop40Links.tsv
```

Figure 3.39: Politics Fine Top 40 Links Politics

```
CRFClassifier tagged 13802 words in 1 documents at 5808,92 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 1,0000  1,0000  1,0000  91      0      0
Totals 1,0000  1,0000  1,0000  91      0      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-SportTop40LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top40Li
ks\SportCoarseGrainedTop40Links.tsv
```

Figure 3.40: Politics Coarse Top 40 Links Politics

```
CRFClassifier tagged 13802 words in 1 documents at 4370,49 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000  1,0000  1,0000  8      0      0
Coach 1,0000  1,0000  1,0000  1      0      0
SportsClub 1,0000  0,9474  0,9730  18      0      1
SportsEvent 1,0000  1,0000  1,0000  29      0      0
SportsLeague 1,0000  1,0000  1,0000  23      0      0
SportsTeam 1,0000  1,0000  1,0000  11      0      0
Totals 1,0000  0,9890  0,9945  90      0      1

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top40Links\ner-SportTop40LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top40Li
ks\SportFineGrainedTop40Links.tsv
```

Figure 3.41: Sport Fine Top 40 Links Sport

3. EXPERIMENTS

```
CRFClassifier tagged 97089 words in 1 documents at 6866,27 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9920  0,9612  0,9764  248     2      10
SPORT    0,9963  0,9926  0,9944  268     1      2
TRANSPORTATION 1,0000  0,9735  0,9865  110     0      3
Totals   0,9952  0,9766  0,9858  626     3      15

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.42: All 3 Domains Coarse Top 100 Links

```
CRFClassifier tagged 40673 words in 1 documents at 8047,69 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9920  0,3615  0,5299  248     2      438
Totals   0,9920  0,3615  0,5299  248     2      438

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top100Links\PoliticsCoarseGrainedTop100Links.tsv
```

Figure 3.43: All 3 Domains Coarse Top 100 Links Politics

```
CRFClassifier tagged 31872 words in 1 documents at 7887,16 words per second.
Entity P      R      F1      TP      FP      FN
SPORT    0,9962  0,9888  0,9925  265     1      3
Totals   0,9962  0,9888  0,9925  265     1      3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top100Links\SportCoarseGrainedTop100Links.tsv
```

Figure 3.44: All 3 Domains Coarse Top 100 Links Sport

```
CRFClassifier tagged 24544 words in 1 documents at 7745,03 words per second.
Entity P      R      F1      TP      FP      FN
SPORT    0,0000  1,0000  0,0000  0       2      0
TRANSPORTATION 1,0000  0,9735  0,9865  110     0      3
Totals   0,9821  0,9735  0,9778  110     2      3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top100Links\TransportationCoarseGrainedTop100Links.tsv
```

Figure 3.45: All 3 Domains Coarse Top 100 Links Transportation

```
CRFClassifier tagged 97089 words in 1 documents at 3538,10 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  0,6957  0,8205  16      0      7
Athlete  1,0000  0,4167  0,5882  15      0      21
Automobile 1,0000  1,0000  1,0000  3       0      0
Coach    1,0000  0,6667  0,8000  2       0      1
Infrastructure 1,0000  1,0000  1,0000  22      0      0
PoliticalParty 0,8774  0,6700  0,7598  136     19     67
Politician 1,0000  0,7455  0,8542  41      0      14
PublicTransitSystem 0,9744  0,7308  0,8352  38      1      14
Ship     1,0000  0,6000  0,7500  3       0      2
SpaceShuttle 1,0000  1,0000  1,0000  6       0      0
SpaceStation 1,0000  1,0000  1,0000  1       0      0
SportsClub 0,9512  0,9398  0,9455  78      4      5
SportsEvent 0,9737  0,8605  0,9136  37      1      6
SportsLeague 0,9500  0,8636  0,9048  57      3      9
SportsManager 1,0000  1,0000  1,0000  6       0      0
SportsTeam 1,0000  0,6364  0,7778  21      0      12
Train    1,0000  1,0000  1,0000  1       0      0
Totals   0,9452  0,7535  0,8385  483     28     158

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.46: All 3 Domains Fine Top 100 Links

3.2. List of experiments

```
CRFClassifier tagged 40673 words in 1 documents at 4051,50 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      164
PoliticalParty 0,8774 0,6700 0,7598 136    19      67
Politician 1,0000 0,1285 0,2278 41     0      278
SportsEvent 0,0000 1,0000 0,0000 0      1      0
Totals 0,8985 0,2580 0,4009 177    20     509

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
100Links\PoliticsFineGrainedTop100Links.tsv
```

Figure 3.47: All 3 Domains Fine Top 100 Links Politics

```
CRFClassifier tagged 31872 words in 1 documents at 3906,84 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 0,4167 0,5882 15     0      21
Coach 1,0000 0,6667 0,8000 2      0      1
SportsClub 0,9506 0,9390 0,9448 77     4      5
SportsEvent 1,0000 0,8605 0,9250 37     0      6
SportsLeague 0,9500 0,8636 0,9048 57     3      9
SportsManager 1,0000 1,0000 1,0000 6      0      0
SportsTeam 1,0000 0,6250 0,7692 20     0      12
Totals 0,9683 0,7985 0,8753 214    7      54

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
100Links\SportFineGrainedTop100Links.tsv
```

Figure 3.48: All 3 Domains Fine Top 100 Links Sport

```
CRFClassifier tagged 24544 words in 1 documents at 3679,76 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 0,6957 0,8205 16     0      7
Automobile 1,0000 1,0000 1,0000 3      0      0
Infrastructure 1,0000 1,0000 1,0000 22     0      0
PublicTransitSystem 0,9744 0,7308 0,8352 38     1      14
Ship 1,0000 0,6000 0,7500 3      0      2
SpaceShuttle 1,0000 1,0000 1,0000 6      0      0
SpaceStation 1,0000 1,0000 1,0000 1      0      0
SportsClub 0,0000 1,0000 0,0000 0      1      0
SportsTeam 0,0000 1,0000 0,0000 0      1      0
Train 1,0000 1,0000 1,0000 1      0      0
Totals 0,9677 0,7965 0,8738 90     3      23

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\To
p100Links\TransportationFineGrainedTop100Links.tsv
```

Figure 3.49: All 3 Domains Fine Top 100 Links Transportation

TEXT
TEXT
TEXT
TEXT
TEXT
TEXT

```
CRFClassifier tagged 40673 words in 1 documents at 7738,39 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9956 0,9898 0,9927 679    3      7
Totals 0,9956 0,9898 0,9927 679    3      7

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-PoliticsTop100LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\To
p100Links\PoliticsCoarseGrainedTop100Links.tsv
```

Figure 3.50: Politics Coarse Top 100 Links Politics

3. EXPERIMENTS

```
CRFClassifier tagged 40673 words in 1 documents at 7513,95 words per second.
Entity P      R      F1      TP      FP      FN
Election 1,0000 0,9878 0,9939 162      0      2
PoliticalParty 0,9950 0,9852 0,9901 200      1      3
Politician 0,9937 0,9906 0,9922 316      2      3
Totals 0,9956 0,9883 0,9920 678      3      8

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-PoliticsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100
Links\PoliticsFineGrainedTop100Links.tsv
```

Figure 3.51: Politics Fine Top 100 Links Politics

```
CRFClassifier tagged 31872 words in 1 documents at 8157,67 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,9963 0,9963 0,9963 267      1      1
Totals 0,9963 0,9963 0,9963 267      1      1

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-SportTop100LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top100
Links\SportCoarseGrainedTop100Links.tsv
```

Figure 3.52: Politics Coarse Top 100 Links Politics

```
CRFClassifier tagged 31872 words in 1 documents at 5172,35 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 0,9722 0,9859 35      0      1
Coach 1,0000 1,0000 1,0000 3      0      0
SportsClub 1,0000 0,9878 0,9939 81      0      1
SportsEvent 1,0000 0,9767 0,9882 42      0      1
SportsLeague 1,0000 1,0000 1,0000 66      0      0
SportsManager 1,0000 1,0000 1,0000 6      0      0
SportsTeam 1,0000 1,0000 1,0000 32      0      0
Totals 1,0000 0,9888 0,9944 265      0      3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top100Links\ner-SportTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Lin
ks\SportFineGrainedTop100Links.tsv
```

Figure 3.53: Sport Fine Top 100 Links Sport

3.2.5 Top 300 Links

TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT

```
CRFClassifier tagged 270361 words in 1 documents at 4557,90 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9872 0,9462 0,9662 615      8      35
SPORT 0,9846 0,9629 0,9736 1090     17      42
TRANSPORTATION 0,9940 0,9823 0,9881 500      3      9
Totals 0,9875 0,9625 0,9748 2205     28      86

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top300Links\All3DomainsTop300LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.54: All 3 Domains Coarse Top 300 Links

3.2. List of experiments

```
CRFClassifier tagged 107491 words in 1 documents at 5438,73 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9839 0,4025 0,5713 611    10    907
TRANSPORTATION 0,0000 1,0000 0,0000 0      3      0
Totals 0,9792 0,4025 0,5705 611    13    907

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top300Links\PoliticsCoarseGrainedTop300Links.tsv
```

Figure 3.55: All 3 Domains Coarse Top 300 Links Politics

```
CRFClassifier tagged 89224 words in 1 documents at 4834,68 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,0000 1,0000 0,0000 0      2      0
SPORT 0,9846 0,9628 0,9736 1086   17    42
TRANSPORTATION 0,0000 1,0000 0,0000 0      1      0
Totals 0,9819 0,9628 0,9722 1086   20    42

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top300Links\SportCoarseGrainedTop300Links.tsv
```

Figure 3.56: All 3 Domains Coarse Top 300 Links Sport

```
CRFClassifier tagged 73646 words in 1 documents at 4706,42 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,0000 1,0000 0,0000 0      4      0
TRANSPORTATION 0,9940 0,9822 0,9880 496    3      9
Totals 0,9861 0,9822 0,9841 496    7      9

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation
\Top300Links\TransportationCoarseGrainedTop300Links.tsv
```

Figure 3.57: All 3 Domains Coarse Top 300 Links Transportation

```
CRFClassifier tagged 270361 words in 1 documents at 1875,59 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 102    0      0
Athlete 1,0000 0,9802 0,9900 198    0      4
Automobile 1,0000 1,0000 1,0000 20     0      0
Coach 1,0000 1,0000 1,0000 4       0      0
Infrastructure 1,0000 0,9820 0,9909 109    0      2
PoliticalParty 0,9860 0,9628 0,9743 492    7      19
Politician 1,0000 0,9353 0,9665 130    0      9
PublicTransitSystem 0,9919 0,9839 0,9879 244    2      4
Ship 1,0000 1,0000 1,0000 15     0      0
SpaceShuttle 1,0000 1,0000 1,0000 6       0      0
SpaceStation 1,0000 1,0000 1,0000 1       0      0
SportsClub 0,9796 0,9683 0,9739 336    7      11
SportsEvent 1,0000 0,9242 0,9606 61     0      5
SportsLeague 0,9647 0,9805 0,9725 301    11     6
SportsManager 1,0000 0,9423 0,9703 49     0      3
SportsTeam 1,0000 0,9805 0,9902 151    0      3
Train 1,0000 1,0000 1,0000 6       0      0
Totals 0,9880 0,9712 0,9795 2225   27     66

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
300Links\All3DomainsTop300LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.58: All 3 Domains Fine Top 300 Links

```
CRFClassifier tagged 107491 words in 1 documents at 3895,87 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      322
PoliticalParty 0,9860 0,9628 0,9743 492    7      19
Politician 1,0000 0,1849 0,3120 127    0      560
PublicTransitSystem 0,0000 1,0000 0,0000 0      2      0
Ship 0,0000 1,0000 0,0000 0      1      0
SportsLeague 0,0000 1,0000 0,0000 0      1      0
Totals 0,9825 0,4072 0,5758 619    11    901

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
300Links\PoliticsFineGrainedTop300Links.tsv
```

Figure 3.59: All 3 Domains Fine Top 300 Links Politics

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```
CRFClassifier tagged 89224 words in 1 documents at 4185,19 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 0,9802 0,9900 198    0      4
Coach 1,0000 1,0000 1,0000 4      0      0
Politician 0,0000 1,0000 0,0000 0      2      0
SportsClub 0,9794 0,9680 0,9737 333    7      11
SportsEvent 1,0000 0,9242 0,9606 61     0      5
SportsLeague 0,9678 0,9805 0,9741 301    10     6
SportsManager 1,0000 0,9423 0,9703 49     0      3
SportsTeam 1,0000 0,9804 0,9901 150    0      3
Train 0,0000 1,0000 0,0000 0      1      0
Totals 0,9821 0,9716 0,9768 1096   20     32

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
300Links\SportFineGrainedTop300Links.tsv
```

Figure 3.60: All 3 Domains Fine Top 300 Links Sport

```
CRFClassifier tagged 73646 words in 1 documents at 3681,01 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 102    0      0
Automobile 1,0000 1,0000 1,0000 20     0      0
Infrastructure 1,0000 0,9820 0,9909 109    0      2
Politician 0,0000 1,0000 0,0000 0      1      0
PublicTransitSystem 0,9918 0,9837 0,9878 242    2      4
Ship 1,0000 1,0000 1,0000 14     0      0
SpaceShuttle 1,0000 1,0000 1,0000 6      0      0
SpaceStation 1,0000 1,0000 1,0000 1      0      0
SportsClub 0,0000 1,0000 0,0000 0      3      0
SportsTeam 0,0000 1,0000 0,0000 0      1      0
Train 1,0000 1,0000 1,0000 5      0      0
Totals 0,9862 0,9881 0,9871 499    7      6

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top
300Links\TransportationFineGrainedTop300Links.tsv
```

Figure 3.61: All 3 Domains Fine Top 300 Links Transportation

```
CRFClassifier tagged 107491 words in 1 documents at 9027,55 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,8039 0,6779 0,7355 1029   251    489
Totals 0,8039 0,6779 0,7355 1029   251    489

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-PoliticsTop300LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\To
p300Links\PoliticsCoarseGrainedTop300Links.tsv
```

Figure 3.62: Politics Coarse Top 300 Links Politics

```
CRFClassifier tagged 107491 words in 1 documents at 6511,05 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,8240 0,6398 0,7203 206    44     116
PoliticalParty 0,8100 0,7006 0,7513 358    84     153
Politician 0,8599 0,7234 0,7858 497    81     190
Totals 0,8354 0,6980 0,7606 1061   209    459

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-PoliticsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300
Links\PoliticsFineGrainedTop300Links.tsv
```

Figure 3.63: Politics Fine Top 300 Links Politics

3.2. List of experiments

```
CRFClassifier tagged 89224 words in 1 documents at 9812,38 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,9432  0,8839  0,9126  997     60     131
Totals 0,9432  0,8839  0,9126  997     60     131

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-SportTop300LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top30
0Links\SportCoarseGrainedTop300Links.tsv
```

Figure 3.64: Politics Coarse Top 300 Links Politics

```
CRFClassifier tagged 89224 words in 1 documents at 5142,89 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 0,9713  0,8366  0,8989  169     5      33
Coach 1,0000  0,7500  0,8571  3       0      1
SportsClub 0,9453  0,9041  0,9242  311     18     33
SportsEvent 1,0000  0,7879  0,8814  52      0      14
SportsLeague 0,9418  0,8958  0,9182  275     17     32
SportsManager 1,0000  0,9615  0,9804  50      0      2
SportsTeam 0,9845  0,8301  0,9007  127     2      26
Totals 0,9592  0,8750  0,9152  987     42     141

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier
modelsWithOneAnnotation\Top300Links\ner-SportTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Lin
ks\SportFineGrainedTop300Links.tsv
```

Figure 3.65: Sport Fine Top 300 Links Sport

```
CRFClassifier tagged 351466 words in 1 documents at 3777,09 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9804  0,9434  0,9615  800     16     48
SPORT 0,9832  0,9590  0,9709  1519    26     65
TRANSPORTATION 0,9941  0,9754  0,9847  674     4      17
Totals 0,9849  0,9584  0,9714  2993    46     130

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier mo
delsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
0Links\All3DomainsTop400LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.66: All 3 Domains Coarse Top 400 Links

TEXT
TEXT

3.2.6 Top 400 Links

TEXT
TEXT
TEXT
TEXT
TEXT

```
CRFClassifier tagged 137620 words in 1 documents at 5615,08 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9754  0,4082  0,5756  792     20     1148
SPORT 0,0000  1,0000  0,0000  0       4      0
TRANSPORTATION 0,0000  1,0000  0,0000  0       15     0
Totals 0,9531  0,4082  0,5716  792     39     1148

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier mo
delsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top40
0Links\PoliticsCoarseGrainedTop400Links.tsv
```

Figure 3.67: All 3 Domains Coarse Top 400 Links Politics

3. EXPERIMENTS

```
CRFClassifier tagged 116878 words in 1 documents at 4957,08 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,0000 1,0000 0,0000 0      3      0
SPORT 0,9837 0,9588 0,9711 1511   25     65
TRANSPORTATION 0,0000 1,0000 0,0000 0      2      0
Totals 0,9805 0,9588 0,9695 1511   30     65

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\SportCoarseGrainedTop400Links.tsv
```

Figure 3.68: All 3 Domains Coarse Top 400 Links Sport

```
CRFClassifier tagged 96968 words in 1 documents at 6509,67 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,0000 1,0000 0,0000 0      1      0
SPORT 0,0000 1,0000 0,0000 0      5      0
TRANSPORTATION 0,9939 0,9762 0,9850 657    4      16
Totals 0,9850 0,9762 0,9806 657    10     16

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\TransportationCoarseGrainedTop400Links.tsv
```

Figure 3.69: All 3 Domains Coarse Top 400 Links Transportation

```
CRFClassifier tagged 351466 words in 1 documents at 2788,70 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 123    0      0
Athlete 1,0000 0,9899 0,9949 294    0      3
Automobile 1,0000 1,0000 1,0000 24     0      0
Coach 1,0000 1,0000 1,0000 4      0      0
Infrastructure 1,0000 0,9896 0,9948 190    0      2
PoliticalParty 0,9766 0,9486 0,9624 627    15     34
Politician 1,0000 0,9893 0,9946 185    0      2
PublicTransitSystem 0,9935 0,9776 0,9855 305    2      7
Ship 1,0000 0,9231 0,9600 24     0      2
SpaceShuttle 1,0000 1,0000 1,0000 6      0      0
SpaceStation 1,0000 1,0000 1,0000 2      0      0
SportsClub 0,9796 0,9658 0,9726 480    10     17
SportsEvent 1,0000 0,8636 0,9268 76     0      12
SportsLeague 0,9698 0,9835 0,9766 417    13     7
SportsManager 1,0000 0,9726 0,9861 71     0      2
SportsTeam 1,0000 0,9851 0,9925 198    0      3
Train 1,0000 1,0000 1,0000 6      0      0
Totals 0,9870 0,9709 0,9789 3032   40     91

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\All3DomainsTop400LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.70: All 3 Domains Fine Top 400 Links

```
CRFClassifier tagged 137620 words in 1 documents at 2890,33 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 1,0000 0,0000 0      1      0
Election 0,0000 0,0000 0,0000 0      0      415
PoliticalParty 0,9766 0,9484 0,9623 625    15     34
Politician 1,0000 0,2092 0,3460 182    0      688
PublicTransitSystem 0,0000 1,0000 0,0000 0      4      0
Ship 0,0000 1,0000 0,0000 0      9      0
SportsClub 0,0000 1,0000 0,0000 0      1      0
SportsLeague 0,0000 1,0000 0,0000 0      2      0
Totals 0,9619 0,4151 0,5799 807    32     1137

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\PoliticsFineGrainedTop400Links.tsv
```

Figure 3.71: All 3 Domains Fine Top 400 Links Politics

3.2. List of experiments

```
CRFClassifier tagged 116878 words in 1 documents at 3423,29 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000  1,0000  0,0000  0       1       0
Athlete  1,0000  0,9899  0,9949  294     0       3
Coach    1,0000  1,0000  1,0000  4       0       0
PoliticalParty 0,0000  1,0000  0,0000  0       1       0
Politician 0,0000  1,0000  0,0000  0       2       0
SportsClub 0,9794  0,9654  0,9724  475    10      17
SportsEvent 1,0000  0,8636  0,9268  76     0      12
SportsLeague 0,9696  0,9834  0,9765  415    13       7
SportsManager 1,0000  0,9726  0,9861  71     0       2
SportsTeam 1,0000  0,9850  0,9924  197     0       3
Train    0,0000  1,0000  0,0000  0       1       0
Totals   0,9821  0,9721  0,9770  1532   28      44

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\SportFineGrainedTop400Links.tsv
```

Figure 3.72: All 3 Domains Fine Top 400 Links Sport

```
CRFClassifier tagged 96968 words in 1 documents at 3314,01 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  121     0       0
Automobile 1,0000  1,0000  1,0000  24      0       0
Infrastructure 1,0000  0,9896  0,9948  190     0       2
PoliticalParty 0,0000  1,0000  0,0000  0       1       0
Politician 0,0000  1,0000  0,0000  0       1       0
PublicTransitSystem 0,9934  0,9773  0,9853  301     2       7
Ship      1,0000  1,0000  1,0000  15      0       0
SpaceShuttle 1,0000  1,0000  1,0000  6       0       0
SpaceStation 1,0000  1,0000  1,0000  2       0       0
SportsClub 0,0000  1,0000  0,0000  0       4       0
SportsTeam 0,0000  1,0000  0,0000  0       1       0
Train     1,0000  1,0000  1,0000  5       0       0
Totals    0,9866  0,9866  0,9866  664     9       9

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-All3DomainsTop400LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\TransportationFineGrainedTop400Links.tsv
```

Figure 3.73: All 3 Domains Fine Top 400 Links Transportation

```
CRFClassifier tagged 137620 words in 1 documents at 6639,01 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9866  0,9479  0,9669  1839    25     101
Totals   0,9866  0,9479  0,9669  1839    25     101

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-PoliticsTop400LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\PoliticsCoarseGrainedTop400Links.tsv
```

Figure 3.74: Politics Coarse Top 400 Links Politics

TEXT
TEXT
TEXT
TEXT
TEXT

```
CRFClassifier tagged 137620 words in 1 documents at 6109,93 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,9075  0,9590  0,9779  398     1      17
PoliticalParty 0,9767  0,9530  0,9647  628    15      31
Politician 0,9977  0,9920  0,9948  863     2       7
Totals   0,9906  0,9717  0,9810  1889    18      55

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-PoliticsTop400LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\PoliticsFineGrainedTop400Links.tsv
```

Figure 3.75: Politics Fine Top 400 Links Politics

3. EXPERIMENTS

```
CRFClassifier tagged 116878 words in 1 documents at 7155,50 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,9858  0,9676  0,9766  1525    22     51
Totals 0,9858  0,9676  0,9766  1525    22     51

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-SportTop400LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\SportCoarseGrainedTop400Links.tsv
```

Figure 3.76: Politics Coarse Top 400 Links Politics

```
CRFClassifier tagged 116878 words in 1 documents at 4135,52 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000  0,9731  0,9863  289     0      8
Coach 1,0000  1,0000  1,0000  4       0      0
SportsClub 0,9815  0,9715  0,9765  478     9     14
SportsEvent 1,0000  0,9091  0,9524  80      0      8
SportsLeague 0,9718  0,9787  0,9752  413    12     9
SportsManager 1,0000  0,9726  0,9861  71     0      2
SportsTeam 1,0000  0,9900  0,9950  198     0      2
Totals 0,9865  0,9727  0,9796  1533    21     43

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top400Links\ner-SportTop400LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top400Links\SportFineGrainedTop400Links.tsv
```

Figure 3.77: Sport Fine Top 400 Links Sport

```
CRFClassifier tagged 423454 words in 1 documents at 4057,94 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9788  0,9444  0,9613  969     21     57
SPORT 0,9850  0,9596  0,9721  1899    29     80
TRANSPORTATION 0,9962  0,9750  0,9855  779     3     20
Totals 0,9857  0,9587  0,9720  3647    53    157

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractCoarseGrainedSpecified.tsv
```

Figure 3.78: All 3 Domains Coarse Top 500 Links

3.2.7 Top 500 Links

TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT
TEXT

```
CRFClassifier tagged 164060 words in 1 documents at 7056,04 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9734  0,4095  0,5765  953     26    1374
SPORT 0,0000  1,0000  0,0000  0       4      0
TRANSPORTATION 0,0000  1,0000  0,0000  0      15     0
Totals 0,9549  0,4095  0,5732  953     45    1374

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsCoarseGrainedTop500Links.tsv
```

Figure 3.79: All 3 Domains Coarse Top 500 Links Politics

3.2. List of experiments

```
CRFClassifier tagged 142322 words in 1 documents at 8310,77 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,0000  1,0000  0,0000  0      9      0
SPORT    0,9849  0,9594  0,9720  1890   29     80
TRANSPORTATION 0,0000  1,0000  0,0000  0      3      0
Totals   0,9788  0,9594  0,9690  1890   41     80

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\SportCoarseGrainedTop500Links.tsv
```

Figure 3.80: All 3 Domains Coarse Top 500 Links Sport

```
CRFClassifier tagged 117072 words in 1 documents at 6921,19 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,0000  1,0000  0,0000  0      2      0
SPORT    0,0000  1,0000  0,0000  0      5      0
TRANSPORTATION 0,9961  0,9769  0,9864  761    3      18
Totals   0,9870  0,9769  0,9819  761    10     18

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\TransportationCoarseGrainedTop500Links.tsv
```

Figure 3.81: All 3 Domains Coarse Top 500 Links Transportation

```
CRFClassifier tagged 423454 words in 1 documents at 2276,66 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  0,9929  0,9964  139    0      1
Athlete  1,0000  0,9896  0,9948  379    0      4
Automobile 1,0000  1,0000  1,0000  25     0      0
Coach    1,0000  1,0000  1,0000  6      0      0
Infrastructure 1,0000  0,9783  0,9890  225    0      5
PoliticalParty 0,9775  0,9403  0,9585  740    17     47
Politician 1,0000  0,9874  0,9937  236    0      3
PublicTransitSystem 0,9944  0,9807  0,9875  355    2      7
Ship     1,0000  0,9259  0,9615  25     0      2
SpaceShuttle 1,0000  1,0000  1,0000  7      0      0
SpaceStation 1,0000  1,0000  1,0000  2      0      0
SportsClub 0,9756  0,9553  0,9654  599    15     28
SportsEvent 1,0000  0,8796  0,9360  95     0      13
SportsLeague 0,9700  0,9810  0,9755  517    16     10
SportsManager 1,0000  0,9780  0,9889  89     0      2
SportsTeam 1,0000  0,9831  0,9915  233    0      4
Train    1,0000  1,0000  1,0000  6      0      0
Totals   0,9866  0,9669  0,9766  3678   50     126

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.82: All 3 Domains Fine Top 500 Links

```
CRFClassifier tagged 164060 words in 1 documents at 3562,26 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000  1,0000  0,0000  0      1      0
Election  0,0000  0,0000  0,0000  0      0     494
PoliticalParty 0,9774  0,9400  0,9583  736    17     47
Politician 1,0000  0,2171  0,3567  229    0     826
PublicTransitSystem 0,0000  1,0000  0,0000  0      4      0
Ship     0,0000  1,0000  0,0000  0      9      0
SpaceShuttle 0,0000  1,0000  0,0000  0      1      0
SportsClub 0,0000  1,0000  0,0000  0      2      0
SportsLeague 0,0000  1,0000  0,0000  0      3      0
Totals   0,9631  0,4138  0,5789  965    37    1367

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsFineGrainedTop500Links.tsv
```

Figure 3.83: All 3 Domains Fine Top 500 Links Politics

3. EXPERIMENTS

```
CRFClassifier tagged 142322 words in 1 documents at 3839,48 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000  1,0000  0,0000  0       2       0
Athlete  1,0000  0,9896  0,9948  379     0       4
Coach    1,0000  1,0000  1,0000  6       0       0
PoliticalParty 0,0000  1,0000  0,0000  0       3       0
Politician 0,0000  1,0000  0,0000  0       6       0
SportsClub 0,9753  0,9549  0,9650  593     15      28
SportsEvent 1,0000  0,8796  0,9360  95      0       13
SportsLeague 0,9717  0,9810  0,9763  515     15      10
SportsManager 1,0000  0,9780  0,9889  89      0       2
SportsTeam 1,0000  0,9831  0,9915  232     0       4
Train    0,0000  1,0000  0,0000  0       1       0
Totals   0,9785  0,9690  0,9737  1909    42      61

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\SportFineGrainedTop500Links.tsv
```

Figure 3.84: All 3 Domains Fine Top 500 Links Sport

```
CRFClassifier tagged 117072 words in 1 documents at 3763,28 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  0,9927  0,9963  136     0       1
Automobile 1,0000  1,0000  1,0000  25      0       0
Infrastructure 1,0000  0,9783  0,9890  225     0       5
PoliticalParty 0,0000  1,0000  0,0000  0       1       0
Politician 0,0000  1,0000  0,0000  0       1       0
PublicTransitSystem 0,9943  0,9804  0,9873  351     2       7
Ship      1,0000  1,0000  1,0000  16      0       0
SpaceShuttle 1,0000  1,0000  1,0000  6       0       0
SpaceStation 1,0000  1,0000  1,0000  2       0       0
SportsClub 0,0000  1,0000  0,0000  0       4       0
SportsTeam 0,0000  1,0000  0,0000  0       1       0
Train    1,0000  1,0000  1,0000  5       0       0
Totals   0,9884  0,9833  0,9858  766     9       13

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\TransportationFineGrainedTop500Links.tsv
```

Figure 3.85: All 3 Domains Fine Top 500 Links Transportation

```
CRFClassifier tagged 164060 words in 1 documents at 7597,48 words per second.
Entity P      R      F1      TP      FP      FN
POLITICS 0,9808  0,9450  0,9626  2199    43      128
Totals   0,9808  0,9450  0,9626  2199    43      128

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-PoliticsTop500LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsCoarseGrainedTop500Links.tsv
```

Figure 3.86: Politics Coarse Top 500 Links Politics

```
CRFClassifier tagged 164060 words in 1 documents at 5517,59 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,9915  0,9393  0,9647  464     4       30
PoliticalParty 0,9777  0,9502  0,9637  744     17      39
Politician 0,9962  0,9877  0,9919  1042    4       13
Totals   0,9890  0,9648  0,9768  2250    25      82

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-PoliticsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsFineGrainedTop500Links.tsv
```

Figure 3.87: Politics Fine Top 500 Links Politics

```
CRFClassifier tagged 142322 words in 1 documents at 8207,73 words per second.
Entity P      R      F1      TP      FP      FN
SPORT 0,9856  0,9706  0,9780  1912    28      58
Totals 0,9856  0,9706  0,9780  1912    28      58

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-SportTop500LinksCoarseGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\SportCoarseGrainedTop500Links.tsv
```

Figure 3.88: Politics Coarse Top 500 Links Politics

3.2. List of experiments

```
CRFClassifier tagged 142322 words in 1 documents at 5008,69 words per second.
Entity P R F1 TP FP FN
Athlete 1,0000 0,9791 0,9894 375 0 8
Coach 1,0000 1,0000 1,0000 6 0 0
SportsClub 0,9771 0,9630 0,9700 598 14 23
SportsEvent 1,0000 0,9074 0,9515 98 0 10
SportsLeague 0,9755 0,9848 0,9801 517 13 8
SportsManager 1,0000 0,9780 0,9889 89 0 2
SportsTeam 1,0000 0,9915 0,9957 234 0 2
Totals 0,9861 0,9731 0,9796 1917 27 53

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-SportTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\SportFineGrainedTop500Links.tsv
```

Figure 3.89: Sport Fine Top 500 Links Sport

```
CRFClassifier tagged 760067 words in 2 documents at 3091,92 words per second.
Entity P R F1 TP FP FN
Aircraft 0,9242 0,5755 0,7093 122 10 90
Athlete 0,8182 0,3778 0,5169 252 56 415
Automobile 0,9565 0,3607 0,5238 22 1 39
Coach 1,0000 0,2000 0,3333 4 0 16
Infrastructure 0,8457 0,2937 0,4359 148 27 356
Locomotive 0,0000 0,0000 0,0000 0 0 2
Motorcycle 0,0000 0,0000 0,0000 0 0 1
OrganisationMember 0,0000 0,0000 0,0000 0 0 1
PoliticalParty 0,7656 0,5819 0,6613 735 225 528
Politician 0,8925 0,4099 0,5618 166 20 239
PublicTransitSystem 0,8291 0,6178 0,7080 388 80 240
Rocket 0,0000 0,0000 0,0000 0 0 5
Ship 0,9375 0,3409 0,5000 15 1 29
SpaceShuttle 1,0000 0,3750 0,5455 6 0 10
SpaceStation 1,0000 0,3333 0,5000 1 0 2
SportsClub 0,8009 0,4276 0,5575 543 135 727
SportsEvent 0,9559 0,3171 0,4762 65 3 140
SportsLeague 0,8071 0,5912 0,6824 548 131 379
SportsManager 0,9643 0,2903 0,4463 54 2 132
SportsTeam 0,8856 0,5838 0,7037 209 27 149
Train 1,0000 0,5455 0,7059 6 0 5
Totals 0,8206 0,4837 0,6087 3284 718 3505

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFiles domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv,domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecifiedWithLowerPageRank.tsv
```

Figure 3.90: All 3 Domains Fine Grained Top 300 With All 3 Domains Fine Grained Top 500 Links And All 3 Domains Fine Grained Top 500 Links With Lower PageRank

TEXT

3.2.8 MIXED

3.2.9 With lower links on model

3.2.10 With higher links on model

3. EXPERIMENTS

```
CRFClassifier tagged 760067 words in 2 documents at 3060,01 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,9735 0,6934 0,8099 147    4      65
Athlete 0,9101 0,6222 0,7391 415    41     252
Automobile 1,0000 0,4098 0,5814 25     0      36
Coach 1,0000 0,3000 0,4615 6       0      14
Infrastructure 0,8885 0,5218 0,6575 263    33     241
Locomotive 0,0000 0,0000 0,0000 0       0      2
Motorcycle 0,0000 0,0000 0,0000 0       0      1
OrganisationMember 0,0000 0,0000 0,0000 0       0      1
PoliticalParty 0,8393 0,7403 0,7867 935    179    328
Politician 0,9271 0,6593 0,7706 267    21     138
PublicTransitSystem 0,9027 0,7389 0,8126 464    50     164
Rocket 0,0000 0,0000 0,0000 0       0      5
Ship 0,9615 0,5682 0,7143 25     1      19
SpaceShuttle 1,0000 0,4375 0,6087 7       0      9
SpaceStation 1,0000 0,6667 0,8000 2       0      1
SportsClub 0,8722 0,6071 0,7159 771    113    499
SportsEvent 0,9000 0,4829 0,6286 99     11     106
SportsLeague 0,8622 0,7357 0,7939 682    109    245
SportsManager 0,9787 0,4946 0,6571 92     2      94
SportsTeam 0,9276 0,7514 0,8302 269    21     89
Train 1,0000 0,5455 0,7059 6       0      5
Totals 0,8844 0,6592 0,7553 4475    585    2314

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFiles domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv,domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecifiedWithLowerPageRank.tsv
```

Figure 3.91: All 3 Domains Fine Grained Top 500 Links With All 3 Domains Fine Grained Top 500 Links And All 3 Domains Fine Grained Top 500 Links With Lower Page Rank

```
CRFClassifier tagged 336613 words in 1 documents at 2685,15 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,6667 0,1111 0,1905 8       4      64
Athlete 0,4675 0,1268 0,1994 36     41     248
Automobile 0,0000 0,0000 0,0000 0       0      36
Coach 0,0000 0,0000 0,0000 0       0      14
Infrastructure 0,5352 0,1387 0,2203 38     33     236
Locomotive 0,0000 0,0000 0,0000 0       0      2
Motorcycle 0,0000 0,0000 0,0000 0       0      1
OrganisationMember 0,0000 0,0000 0,0000 0       0      1
PoliticalParty 0,5462 0,4097 0,4682 195    162    281
Politician 0,5962 0,1867 0,2844 31     21     135
PublicTransitSystem 0,6043 0,4098 0,5154 109    48     157
Rocket 0,0000 0,0000 0,0000 0       0      5
Ship 0,0000 0,0000 0,0000 0       1      17
SpaceShuttle 0,0000 0,0000 0,0000 0       0      9
SpaceStation 0,0000 0,0000 0,0000 0       0      1
SportsClub 0,6370 0,2675 0,3768 172    98     471
SportsEvent 0,2667 0,0412 0,0714 4       11     93
SportsLeague 0,6395 0,4125 0,5015 165    93     235
SportsManager 0,6000 0,0316 0,0600 3       2      92
SportsTeam 0,6316 0,2975 0,4045 36     21     85
Train 0,0000 0,0000 0,0000 0       0      5
Totals 0,5983 0,2670 0,3692 797    535    2188

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecifiedWithLowerPageRank.tsv
```

Figure 3.92: All 3 Domains Fine Grained Top 500 Links With All 3 Domains Fine Grained Top 500 Links With Lower PageRank

3.2. List of experiments

```
CRFClassifier tagged 344007 words in 2 documents at 4801,01 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,9950  0,9706  0,9826  198     1      6
Athlete  0,0000  0,0000  0,0000  0       0      202
Automobile 1,0000  0,8500  0,9189  34      0      6
Coach    0,0000  0,0000  0,0000  0       0      4
Infrastructure 1,0000  0,9820  0,9909  218     0      4
PoliticalParty 0,0000  0,0000  0,0000  0       0      511
Politician 0,0000  0,0000  0,0000  0       0      139
PublicTransitSystem 0,9835  0,9676  0,9755  478     8      16
Ship     1,0000  0,9655  0,9825  28      0      1
SpaceShuttle 1,0000  0,6667  0,8000  8       0      4
SpaceStation 1,0000  1,0000  1,0000  2       0      0
SportsClub 0,0000  0,0000  0,0000  0       0      347
SportsEvent 0,0000  0,0000  0,0000  0       0      66
SportsLeague 0,0000  0,0000  0,0000  0       0      307
SportsManager 0,0000  0,0000  0,0000  0       0      52
SportsTeam 0,0000  0,0000  0,0000  0       0      154
Train    1,0000  0,9091  0,9524  10      0      1
Totals   0,9909  0,3491  0,5163  976     9      1820

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-TransportationTop500LinksFineGrained.ser.gz -testFiles domainsWithOneAnnotation\Top300Links\All3DomainsTop300LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv,domainsWithOneAnnotation\Top300Links\TransportationFineGrainedTop300Links.tsv
```

Figure 3.93: Transportation Fine Grained Top 500 Links Runned With All 3 Domains Fine Grained Top 300 Links And Transportation Fine Grained Top 300 Links

```
CRFClassifier tagged 97089 words in 1 documents at 2905,12 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  0,0435  0,0833  1       0      22
Athlete  1,0000  0,0278  0,0541  1       0      35
Automobile 0,0000  0,0000  0,0000  0       0      3
Coach    1,0000  0,3333  0,5000  1       0      2
Infrastructure 0,0000  0,0000  0,0000  0       0      22
PoliticalParty 0,6458  0,3054  0,4147  62      34      141
Politician 1,0000  0,0727  0,1356  4       0      51
PublicTransitSystem 0,8750  0,1346  0,2333  7       1      45
Ship     1,0000  0,2000  0,3333  1       0      4
SpaceShuttle 0,0000  0,0000  0,0000  0       0      6
SpaceStation 0,0000  0,0000  0,0000  0       0      1
SportsClub 0,0000  0,1084  0,1935  9       1      74
SportsEvent 1,0000  0,0233  0,0455  1       0      42
SportsLeague 0,6667  0,2121  0,3218  14      7      52
SportsManager 0,0000  0,0000  0,0000  0       0      6
SportsTeam 1,0000  0,0303  0,0588  1       0      32
Train    0,0000  0,0000  0,0000  0       0      1
Totals   0,7034  0,1591  0,2595  102     43      539

C:\Dev\stanford-ner-2017-06-09>java -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.94: All 3 Domains Fine Grained Top 10 Links Runned With All 3 Domains Fine Grained Top 100 Links

3. EXPERIMENTS

```
CRFClassifier tagged 270361 words in 1 documents at 3542.70 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 0,0000 0,0194 1      0      101
Athlete 1,0000 0,0050 0,0099 1      0      201
Automobile 0,0000 0,0000 0,0000 0      0      20
Coach 1,0000 0,2500 0,4000 1      0      3
Infrastructure 0,0000 0,0000 0,0000 0      0      111
PoliticalParty 0,5517 0,2192 0,3137 112    91     399
Politician 0,8000 0,0288 0,0556 4      1      135
PublicTransitSystem 0,6364 0,0282 0,0541 7      4      241
Ship 1,0000 0,0667 0,1250 1      0      14
SpaceShuttle 0,0000 0,0000 0,0000 0      0      6
SpaceStation 0,0000 0,0000 0,0000 0      0      1
SportsClub 0,8750 0,0403 0,0771 14     2      333
SportsEvent 1,0000 0,0152 0,0299 1      0      65
SportsLeague 0,6102 0,1173 0,1967 36     23     271
SportsManager 0,0000 0,0000 0,0000 0      0      52
SportsTeam 1,0000 0,0065 0,0129 1      0      153
Train 0,0000 0,0000 0,0000 0      0      6
Totals 0,5967 0,0781 0,1382 179    121    2112

C:\Dev\stanford-ner-2017-06-09>java -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Links\All3DomainsTop300LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.95: All 3 Domains Fine Grained Top 10 Links Runned With All 3 Domains Fine Grained Top 300 Links

```
CRFClassifier tagged 423454 words in 1 documents at 3197.54 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 0,0071 0,0142 1      0      139
Athlete 1,0000 0,0026 0,0052 1      0      382
Automobile 0,0000 0,0000 0,0000 0      0      25
Coach 1,0000 0,1667 0,2857 1      0      5
Infrastructure 0,0000 0,0000 0,0000 0      0      230
PoliticalParty 0,5385 0,1957 0,2870 154    132    633
Politician 0,8000 0,0167 0,0328 4      1      235
PublicTransitSystem 0,4118 0,0193 0,0369 7      10     355
Ship 1,0000 0,0370 0,0714 1      0      26
SpaceShuttle 0,0000 0,0000 0,0000 0      0      7
SpaceStation 0,0000 0,0000 0,0000 0      0      2
SportsClub 0,8148 0,0351 0,0673 22     5      605
SportsEvent 1,0000 0,0093 0,0183 1      0      107
SportsLeague 0,5556 0,0854 0,1480 45     36     482
SportsManager 0,0000 0,0000 0,0000 0      0      91
SportsTeam 1,0000 0,0295 0,0574 7      0      230
Train 0,0000 0,0000 0,0000 0      0      6
Totals 0,5701 0,0641 0,1153 244    184    3560

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top10Links\ner-All3DomainsTop10LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.96: All 3 Domains Fine Grained Top 10 Links Runned With All 3 Domains Fine Grained Top 500 Links

3.2. List of experiments

```
CRFClassifier tagged 336613 words in 1 documents at 2416,32 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 0,0000 0,0000 0      0      72
Athlete 0,0000 0,0000 0,0000 0      0      284
Automobile 0,0000 0,0000 0,0000 0      0      36
Coach 0,0000 0,0000 0,0000 0      0      14
Infrastructure 0,0000 0,0000 0,0000 0      0      274
Locomotive 0,0000 0,0000 0,0000 0      0      2
Motorcycle 0,0000 0,0000 0,0000 0      0      1
OrganisationMember 0,0000 0,0000 0,0000 0      0      1
PoliticalParty 0,3916 0,1176 0,1809 56      87      420
Politician 0,0000 0,0000 0,0000 0      0      166
PublicTransitSystem 0,0000 0,0000 0,0000 0      0      10
Rocket 0,0000 0,0000 0,0000 0      0      5
Ship 0,0000 0,0000 0,0000 0      0      17
SpaceShuttle 0,0000 0,0000 0,0000 0      0      9
SpaceStation 0,0000 0,0000 0,0000 0      0      1
SportsClub 0,5455 0,0187 0,0361 12      10      631
SportsEvent 0,0000 0,0000 0,0000 0      0      97
SportsLeague 0,4348 0,0500 0,0897 20      26      380
SportsManager 0,0000 0,0000 0,0000 0      0      95
SportsTeam 1,0000 0,0331 0,0640 4      0      117
Train 0,0000 0,0000 0,0000 0      0      5
Totals 0,4089 0,0308 0,0573 92      133      2893

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecifiedWithLowerPageRank.tsv
```

Figure 3.97: All 3 Domains Fine Grained Top 10 Links Runned With All 3 Domains Fine Grained Top 500 Links With Lower PageRank

```
CRFClassifier tagged 423454 words in 1 documents at 2649,15 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,9677 0,2143 0,3509 30      1      110
Athlete 1,0000 0,0392 0,0754 15      0      368
Automobile 1,0000 0,1600 0,2759 4      0      21
Coach 1,0000 0,3333 0,5000 2      0      4
Infrastructure 0,8065 0,1087 0,1916 25      6      205
PoliticalParty 0,7288 0,4473 0,5543 352      131      435
Politician 0,8851 0,3222 0,4724 77      10      162
PublicTransitSystem 0,8217 0,3564 0,4971 129      28      233
Ship 1,0000 0,1111 0,2000 3      0      24
SpaceShuttle 1,0000 0,8571 0,9231 6      0      1
SpaceStation 1,0000 0,5000 0,6667 1      0      1
SportsClub 0,8193 0,3254 0,4658 204      45      423
SportsEvent 0,9048 0,3519 0,5067 38      4      70
SportsLeague 0,8392 0,4953 0,6229 261      50      266
SportsManager 1,0000 0,0769 0,1429 7      0      84
SportsTeam 1,0000 0,1814 0,3071 43      0      194
Train 1,0000 0,5000 0,6667 3      0      3
Totals 0,8136 0,3155 0,4546 1200      275      2604

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.98: All 3 Domains Fine Grained Top 100 Links Runned With All 3 Domains Fine Grained Top 500 Links

3. EXPERIMENTS

```
CRFClassifier tagged 336613 words in 1 documents at 3519,92 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 0,0000 0,0000 0      1      72
Athlete 0,0000 0,0000 0,0000 0      0      284
Automobile 0,0000 0,0000 0,0000 0      0      36
Coach 0,0000 0,0000 0,0000 0      0      14
Infrastructure 0,0000 0,0000 0,0000 0      7      274
Locomotive 0,0000 0,0000 0,0000 0      0      2
Motorcycle 0,0000 0,0000 0,0000 0      0      1
OrganisationMember 0,0000 0,0000 0,0000 0      0      1
PoliticalParty 0,5022 0,2374 0,3224 113    112    363
Politician 0,5517 0,0964 0,1641 16     13     150
PublicTransitSystem 0,7255 0,1391 0,2334 37     14     229
Rocket 0,0000 0,0000 0,0000 0      0      5
Ship 0,0000 0,0000 0,0000 0      0      17
SpaceShuttle 0,0000 0,0000 0,0000 0      0      9
SpaceStation 0,0000 0,0000 0,0000 0      0      1
SportsClub 0,6093 0,1431 0,2317 92     59     551
SportsEvent 0,1667 0,0103 0,0194 1      5      96
SportsLeague 0,6092 0,2650 0,3693 106    68     294
SportsManager 0,0000 0,0000 0,0000 0      1      95
SportsTeam 0,8571 0,0496 0,0937 6      1      115
Train 0,0000 0,0000 0,0000 0      0      5
Totals 0,5690 0,1243 0,2040 371    281    2614

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecifiedWithLowerPageRank.tsv
```

Figure 3.99: All 3 Domains Fine Grained Top 100 Links Runned With All 3 Domains Fine Grained Top 500 Links With Lower PageRank

```
CRFClassifier tagged 164060 words in 1 documents at 3254,58 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      494
PoliticalParty 0,7282 0,4483 0,5549 351    131    432
Politician 0,9398 0,0739 0,1371 78     5      977
SportsEvent 0,0000 1,0000 0,0000 0      1      0
SportsLeague 0,0000 1,0000 0,0000 0      5      0
Totals 0,7513 0,1840 0,2956 429    142    1903

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsFineGrainedTop500Links.tsv
```

Figure 3.100: All 3 Domains Fine Grained Top 100 Links Runned With Politics Fine Grained Top 500 Links

```
CRFClassifier tagged 117053 words in 1 documents at 3034,66 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      197
Infrastructure 0,0000 1,0000 0,0000 0      2      0
PoliticalParty 0,5045 0,2379 0,3233 113    111    362
Politician 0,6667 0,0245 0,0473 16     8      636
PublicTransitSystem 0,0000 1,0000 0,0000 0      3      0
SportsEvent 0,0000 1,0000 0,0000 0      2      0
SportsLeague 0,0000 1,0000 0,0000 0      3      0
Totals 0,5000 0,0974 0,1631 129    129    1195

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsFineGrainedTop500Links\ner-All3DomainsTop500LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecifiedWithLowerPageRank.tsv
```

Figure 3.101: All 3 Domains Fine Grained Top 100 Links Runned With Politics Fine Grained Top 500 Links With Lower PageRank

3.2. List of experiments

```
CRFClassifier tagged 142322 words in 1 documents at 3035,30 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 0,0392 0,0754 15      0      368
Coach 1,0000 0,3333 0,5000 2       0      4
Infrastructure 0,0000 1,0000 0,0000 0       1      0
PoliticalParty 0,0000 1,0000 0,0000 0       1      0
Politician 0,0000 1,0000 0,0000 0       1      0
SportsClub 0,8185 0,3269 0,4672 203     45     418
SportsEvent 0,9268 0,3519 0,5101 38      3       70
SportsLeague 0,8497 0,4952 0,6258 260     46     265
SportsManager 1,0000 0,0769 0,1429 7       0      84
SportsTeam 1,0000 0,1780 0,3022 42      0      194
Totals 0,8539 0,2878 0,4305 567     97     1403

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\SportFineGrainedTop500Links.tsv
```

Figure 3.102: All 3 Domains Fine Grained Top 100 Links Runned With Sport Fine Grained Top 500 Links

```
CRFClassifier tagged 118469 words in 1 documents at 3761,28 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 0,0000 0,0000 0,0000 0       0      271
Coach 0,0000 0,0000 0,0000 0       0      14
Infrastructure 0,0000 1,0000 0,0000 0       1      0
OrganisationMember 0,0000 0,0000 0,0000 0       0      1
Politician 0,0000 1,0000 0,0000 0       4      0
SportsClub 0,6216 0,1467 0,2374 92      56     535
SportsEvent 0,2500 0,0104 0,0200 1       3       95
SportsLeague 0,6082 0,2620 0,3662 104     67     293
SportsManager 0,0000 0,0000 0,0000 0       1      89
SportsTeam 0,8571 0,0504 0,0952 6       1     113
Totals 0,6042 0,1258 0,2082 203     133    1411

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\WithLowerPageRank\SportFineGrainedTop500Links\WithLowerPageRank.tsv
```

Figure 3.103: All 3 Domains Fine Grained Top 100 Links Runned With Sport Fine Grained Top 500 Links With Lower PageRank

```
CRFClassifier tagged 117072 words in 1 documents at 3791,68 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,9677 0,2190 0,3571 30      1     107
Automobile 1,0000 0,1600 0,2759 4       0      21
Infrastructure 0,8333 0,1087 0,1923 25      5     205
Politician 0,0000 1,0000 0,0000 0       3      0
PublicTransitSystem 0,8217 0,3603 0,5010 129     28     229
Ship 1,0000 0,1875 0,3158 3       0     13
SpaceShuttle 1,0000 1,0000 1,0000 6       0      0
SpaceStation 1,0000 0,5000 0,6667 1       0      1
SportsClub 0,0000 1,0000 0,0000 0       1      0
SportsTeam 0,0000 1,0000 0,0000 0       1      0
Train 1,0000 0,6000 0,7500 3       0      2
Totals 0,8375 0,2580 0,3945 201     39     578

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\TransportationFineGrainedTop500Links.tsv
```

Figure 3.104: All 3 Domains Fine Grained Top 100 Links Runned With Transportation Fine Grained Top 500 Links

3. EXPERIMENTS

```
CRFClassifier tagged 101091 words in 1 documents at 3831,82 words per second.
Entity P R F1 TP FP FN
Aircraft 0,0000 0,0000 0,0000 0 1 72
Automobile 0,0000 0,0000 0,0000 0 0 36
Infrastructure 0,0000 0,0000 0,0000 0 4 272
Locomotive 0,0000 0,0000 0,0000 0 0 2
Motorcycle 0,0000 0,0000 0,0000 0 0 1
PoliticalParty 0,0000 1,0000 0,0000 0 1 0
Politician 0,0000 1,0000 0,0000 0 1 0
PublicTransitSystem 0,7083 0,1399 0,2337 34 14 209
Rocket 0,0000 0,0000 0,0000 0 0 5
Ship 0,0000 0,0000 0,0000 0 0 12
SpaceShuttle 0,0000 0,0000 0,0000 0 0 9
SpaceStation 0,0000 0,0000 0,0000 0 0 1
SportsClub 0,0000 1,0000 0,0000 0 3 0
Train 0,0000 0,0000 0,0000 0 0 5
Totals 0,5862 0,0517 0,0950 34 24 624

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top100Links\ner-All3DomainsTop100LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\LowerPageRank\TransportationFineGrainedTop500Links\LowerPageRank.tsv
```

Figure 3.105: All 3 Domains Fine Grained Top 100 Links Runned With Transportation Fine Grained Top 500 Links With Lower PageRank

```
CRFClassifier tagged 423454 words in 1 documents at 2349,18 words per second.
Entity P R F1 TP FP FN
Aircraft 0,9573 0,8000 0,8716 112 5 28
Athlete 0,8889 0,5849 0,7055 224 28 159
Automobile 0,9565 0,8800 0,9167 22 1 3
Coach 1,0000 0,6667 0,8000 4 0 2
Infrastructure 0,9034 0,5696 0,6987 131 14 99
PoliticalParty 0,8854 0,7268 0,7983 572 74 215
Politician 0,9664 0,6025 0,7423 144 5 95
PublicTransitSystem 0,8966 0,7901 0,8399 286 33 76
Ship 1,0000 0,5556 0,7143 15 0 12
SpaceShuttle 1,0000 0,8571 0,9231 6 0 1
SpaceStation 1,0000 0,5000 0,6667 1 0 1
SportsClub 0,9018 0,6443 0,7516 404 44 223
SportsEvent 0,9688 0,5741 0,7209 62 2 46
SportsLeague 0,9079 0,7856 0,8423 414 42 113
SportsManager 0,9811 0,5714 0,7222 52 1 39
SportsTeam 0,9784 0,7637 0,8578 181 4 56
Train 1,0000 1,0000 1,0000 6 0 0
Totals 0,9124 0,6930 0,7877 2636 253 1168

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\All3DomainsTop500Links\TextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.106: All 3 Domains Fine Grained Top 300 Links Runned With All 3 Domains Fine Grained Top 500 Links

```
CRFClassifier tagged 336613 words in 1 documents at 3545,42 words per second.
Entity P R F1 TP FP FN
Aircraft 0,6667 0,1389 0,2299 10 5 62
Athlete 0,5000 0,0986 0,1647 28 28 256
Automobile 0,0000 0,0000 0,0000 0 0 36
Coach 0,0000 0,0000 0,0000 0 0 14
Infrastructure 0,5667 0,0620 0,1118 17 13 257
Locomotive 0,0000 0,0000 0,0000 0 0 2
Motorcycle 0,0000 0,0000 0,0000 0 0 1
OrganisationMember 0,0000 0,0000 0,0000 0 0 1
PoliticalParty 0,5191 0,3424 0,4127 163 151 313
Politician 0,5946 0,1325 0,2167 22 15 144
PublicTransitSystem 0,6846 0,3835 0,4916 102 47 164
Rocket 0,0000 0,0000 0,0000 0 0 5
Ship 0,0000 0,0000 0,0000 0 1 17
SpaceShuttle 0,0000 0,0000 0,0000 0 0 9
SpaceStation 0,0000 0,0000 0,0000 0 0 1
SportsClub 0,6043 0,2162 0,3184 139 91 504
SportsEvent 0,7500 0,0309 0,0594 3 1 94
SportsLeague 0,6009 0,3350 0,4302 134 89 266
SportsManager 0,6667 0,0211 0,0408 2 1 93
SportsTeam 0,5490 0,2314 0,3256 28 23 93
Train 0,0000 0,0000 0,0000 0 0 5
Totals 0,5822 0,2171 0,3163 648 465 2337

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\LowerPageRank\All3DomainsTop500Links\TextWithSameProcessedLinksOnAbstractFineGrainedSpecified\LowerPageRank.tsv
```

Figure 3.107: All 3 Domains Fine Grained Top 300 Links Runned With All 3 Domains Fine Grained Top 500 Links With Lower PageRank

3.2. List of experiments

```
CRFClassifier tagged 164060 words in 1 documents at 4066,23 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 0,0000  1,0000  0,0000  0       9       0
Election 0,0000  0,0000  0,0000  0       0      494
PoliticalParty 0,8853  0,7292  0,7997  571     74     212
Politician 0,9792  0,1336  0,2352  141     3      914
PublicTransitSystem 0,0000  1,0000  0,0000  0       2       0
Ship 0,0000  1,0000  0,0000  0       1       0
SportsClub 0,0000  1,0000  0,0000  0       1       0
SportsLeague 0,0000  1,0000  0,0000  0       2       0
SportsManager 0,0000  1,0000  0,0000  0       1       0
Totals 0,8845  0,3053  0,4539  712     93     1620

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\PoliticsFineGrainedTop500Links.tsv
```

Figure 3.108: All 3 Domains Fine Grained Top 300 Links Runned With Politics Fine Grained Top 500 Links

```
CRFClassifier tagged 117053 words in 1 documents at 4211,90 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 0,0000  1,0000  0,0000  0       6       0
Election 0,0000  0,0000  0,0000  0       0      197
Infrastructure 0,0000  1,0000  0,0000  0       1       0
PoliticalParty 0,5209  0,3411  0,4122  162     149    313
Politician 0,5882  0,0307  0,0583  20      14     632
PublicTransitSystem 0,0000  1,0000  0,0000  0       9       0
SportsLeague 0,0000  1,0000  0,0000  0       2       0
SportsTeam 0,0000  1,0000  0,0000  0       1       0
Totals 0,5000  0,1375  0,2156  182     182    1142

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\WithLowerPageRank\PoliticsFineGrainedTop500Links\WithLowerPageRank.tsv
```

Figure 3.109: All 3 Domains Fine Grained Top 300 Links Runned With Politics Fine Grained Top 500 Links With Lower PageRank

```
CRFClassifier tagged 142322 words in 1 documents at 4466,12 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000  1,0000  0,0000  0       1       0
Athlete 0,9218  0,5849  0,7157  224     19     159
Automobile 0,0000  1,0000  0,0000  0       1       0
Coach 1,0000  0,6667  0,8000  4       0       2
PoliticalParty 0,0000  1,0000  0,0000  0       1       0
Politician 0,0000  1,0000  0,0000  0       3       0
SportsClub 0,9809  0,6441  0,7512  400     44     221
SportsEvent 0,9688  0,5741  0,7209  62      2       46
SportsLeague 0,9097  0,7867  0,8437  413     41     112
SportsManager 1,0000  0,5714  0,7273  52      0       39
SportsTeam 0,9783  0,7627  0,8571  180     4       56
Train 0,0000  1,0000  0,0000  0       1       0
Totals 0,9194  0,6777  0,7802  1335    117     635

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\SportFineGrainedTop500Links.tsv
```

Figure 3.110: All 3 Domains Fine Grained Top 300 Links Runned With Sport Fine Grained Top 500 Links

3. EXPERIMENTS

```
CRFClassifier tagged 118469 words in 1 documents at 4461,27 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 0,5833  0,1033  0,1755  28      20      243
Coach 0,0000  0,0000  0,0000  0        0        14
OrganisationMember 0,0000  0,0000  0,0000  0        0        1
PoliticalParty 0,0000  1,0000  0,0000  0        3        0
Politician 0,0000  1,0000  0,0000  0        3        0
SportsClub 0,6096  0,2217  0,3251  139     89      488
SportsEvent 0,7500  0,0313  0,0600  3        1        93
SportsLeague 0,6000  0,3325  0,4279  132     88      265
SportsManager 0,6667  0,0225  0,0435  2        1        87
SportsTeam 0,5833  0,2353  0,3353  28      20      91
Totals 0,5961  0,2057  0,3058  332     225     1282

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\inksWithLowerPageRank\SportFineGrainedTop500Links\inksWithLowerPageRank.tsv
```

Figure 3.111: All 3 Domains Fine Grained Top 300 Links Runned With Sport Fine Grained Top 500 Links With Lower PageRank

```
CRFClassifier tagged 117072 words in 1 documents at 4190,42 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,9569  0,8102  0,8775  111     5        26
Automobile 1,0000  0,8800  0,9362  22      0        3
Infrastructure 0,9034  0,5696  0,6987  131     14      99
Politician 0,0000  1,0000  0,0000  0        2        0
PublicTransitSystem 0,8959  0,7933  0,8415  284     33      74
Ship 1,0000  0,8750  0,9333  14      0        2
SpaceShuttle 1,0000  1,0000  1,0000  6        0        0
SpaceStation 1,0000  0,5000  0,6667  1        0        1
SportsClub 0,0000  1,0000  0,0000  0        3        0
SportsTeam 0,0000  1,0000  0,0000  0        1        0
Train 1,0000  1,0000  1,0000  5        0        0
Totals 0,9082  0,7368  0,8136  574     58      205

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\TransportationFineGrainedTop500Links\inksWithLowerPageRank.tsv
```

Figure 3.112: All 3 Domains Fine Grained Top 300 Links Runned With Transportation Fine Grained Top 500 Links

```
CRFClassifier tagged 101091 words in 1 documents at 3283,24 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,6667  0,1380  0,2299  10      5        62
Athlete 0,0000  1,0000  0,0000  0        2        0
Automobile 0,0000  0,0000  0,0000  0        0        36
Infrastructure 0,5862  0,0625  0,1130  17      12      255
Locomotive 0,0000  0,0000  0,0000  0        0        2
Motorcycle 0,0000  0,0000  0,0000  0        0        1
PublicTransitSystem 0,6714  0,3868  0,4909  94      46      149
Rocket 0,0000  0,0000  0,0000  0        0        5
Ship 0,0000  0,0000  0,0000  0        1        12
SpaceShuttle 0,0000  0,0000  0,0000  0        0        9
SpaceStation 0,0000  0,0000  0,0000  0        0        1
SportsClub 0,0000  1,0000  0,0000  0        2        0
SportsLeague 0,0000  1,0000  0,0000  0        1        0
SportsTeam 0,0000  1,0000  0,0000  0        2        0
Train 0,0000  0,0000  0,0000  0        0        5
Totals 0,6302  0,1839  0,2847  121     71      537

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top500Links\inksWithLowerPageRank\TransportationFineGrainedTop500Links\inksWithLowerPageRank.tsv
```

Figure 3.113: All 3 Domains Fine Grained Top 300 Links Runned With Transportation Fine Grained Top 500 Links With Lower PageRank

3.2. List of experiments

```
CRFClassifier tagged 10336 words in 1 documents at 2532,71 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  1      0      0
Athlete 1,0000  1,0000  1,0000  1      0      0
Coach 1,0000  1,0000  1,0000  1      0      0
PoliticalParty 0,9545  0,8077  0,8750  21     1      5
Politician 1,0000  1,0000  1,0000  4      0      0
PublicTransitSystem 1,0000  0,8571  0,9231  6      0      1
Ship 1,0000  1,0000  1,0000  1      0      0
SportsClub 1,0000  1,0000  1,0000  7      0      0
SportsEvent 1,0000  1,0000  1,0000  1      0      0
SportsLeague 1,0000  0,7500  0,8571  3      0      1
SportsTeam 1,0000  1,0000  1,0000  1      0      0
Totals 0,9792  0,8704  0,9216  47     1      7

C:\Dev\stanford-nlp-2017-06-09>java -Xmx11g -cp stanford-nlp.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\All3DomainsTop10LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.114: All 3 Domains Fine Grained Top 300 Links Runned With All 3 Domains Fine Grained Top 10 Links

```
CRFClassifier tagged 97089 words in 1 documents at 4145,56 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  23     0      0
Athlete 1,0000  1,0000  1,0000  36     0      0
Automobile 1,0000  1,0000  1,0000  3      0      0
Coach 1,0000  1,0000  1,0000  3      0      0
Infrastructure 1,0000  1,0000  1,0000  22     0      0
PoliticalParty 0,9848  0,9606  0,9726  195    3      8
Politician 1,0000  0,8909  0,9423  49     0      6
PublicTransitSystem 0,9800  0,9423  0,9608  49     1      3
Ship 1,0000  1,0000  1,0000  5      0      0
SpaceShuttle 1,0000  1,0000  1,0000  6      0      0
SpaceStation 1,0000  1,0000  1,0000  1      0      0
SportsClub 0,9639  0,9639  0,9639  80     3      3
SportsEvent 1,0000  0,9767  0,9882  42     0      1
SportsLeague 0,9403  0,9545  0,9474  63     4      3
SportsManager 1,0000  0,8333  0,9091  5      0      1
SportsTeam 1,0000  1,0000  1,0000  33     0      0
Train 1,0000  1,0000  1,0000  1      0      0
Totals 0,9825  0,9610  0,9716  616    11     25

C:\Dev\stanford-nlp-2017-06-09>java -Xmx11g -cp stanford-nlp.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.115: All 3 Domains Fine Grained Top 300 Links Runned With All 3 Domains Fine Grained Top 100 Links

```
CRFClassifier tagged 4504 words in 1 documents at 2969,02 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000  0,0000  0,0000  0      0      15
PoliticalParty 0,9545  0,8077  0,8750  21     1      5
Politician 1,0000  0,1111  0,2000  4      0      32
Totals 0,9615  0,3247  0,4854  25     1      52

C:\Dev\stanford-nlp-2017-06-09>java -Xmx11g -cp stanford-nlp.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\PoliticsFineGrainedTop10Links.tsv
```

Figure 3.116: All 3 Domains Fine Grained Top 300 Links Runned With Politics Fine Grained Top 10 Links

```
CRFClassifier tagged 40673 words in 1 documents at 4019,47 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000  0,0000  0,0000  0      0      164
PoliticalParty 0,9848  0,9606  0,9726  195    3      8
Politician 1,0000  0,1536  0,2663  49     0      270
Totals 0,9879  0,3557  0,5230  244    3      442

C:\Dev\stanford-nlp-2017-06-09>java -Xmx11g -cp stanford-nlp.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\PoliticsFineGrainedTop100Links.tsv
```

Figure 3.117: All 3 Domains Fine Grained Top 300 Links Runned With Politics Fine Grained Top 100 Links

3. EXPERIMENTS

```
CRFClassifier tagged 2854 words in 1 documents at 2994,75 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000  1,0000  1,0000  1       0       0
Coach 1,0000  1,0000  1,0000  1       0       0
SportsClub 1,0000  1,0000  1,0000  7       0       0
SportsEvent 1,0000  1,0000  1,0000  1       0       0
SportsLeague 1,0000  0,7500  0,8571  3       0       1
SportsTeam 1,0000  1,0000  1,0000  1       0       0
Totals 1,0000  0,9333  0,9655  14      0       1

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\SportFineGrainedTop10Links.tsv
```

Figure 3.118: All 3 Domains Fine Grained Top 300 Links Runned With Sport Fine Grained Top 10 Links

```
CRFClassifier tagged 31872 words in 1 documents at 3691,88 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000  1,0000  1,0000  36      0       0
Coach 1,0000  1,0000  1,0000  3       0       0
SportsClub 0,9634  0,9634  0,9634  79      3       3
SportsEvent 1,0000  0,9767  0,9882  42      0       1
SportsLeague 0,9403  0,9545  0,9474  63      4       3
SportsManager 1,0000  0,8333  0,9091  5       0       1
SportsTeam 1,0000  1,0000  1,0000  32      0       0
Totals 0,9738  0,9701  0,9720  260     7       8

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\SportFineGrainedTop100Links.tsv
```

Figure 3.119: All 3 Domains Fine Grained Top 300 Links Runned With Sport Fine Grained Top 100 Links

```
CRFClassifier tagged 2978 words in 1 documents at 2863,46 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  1       0       0
PublicTransitSystem 1,0000  0,8571  0,9231  6       0       1
Ship 1,0000  1,0000  1,0000  1       0       0
Totals 1,0000  0,8889  0,9412  8       0       1

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\TransportationFineGrainedTop10Links.tsv
```

Figure 3.120: All 3 Domains Fine Grained Top 300 Links Runned With Transportation Fine Grained Top 10 Links

```
CRFClassifier tagged 24544 words in 1 documents at 4180,55 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000  1,0000  1,0000  23      0       0
Automobile 1,0000  1,0000  1,0000  3       0       0
Infrastructure 1,0000  1,0000  1,0000  22      0       0
PublicTransitSystem 0,9800  0,9423  0,9608  49      1       3
Ship 1,0000  1,0000  1,0000  5       0       0
SpaceShuttle 1,0000  1,0000  1,0000  6       0       0
SpaceStation 1,0000  1,0000  1,0000  1       0       0
SportsClub 0,0000  1,0000  0,0000  0       1       0
SportsTeam 0,0000  1,0000  0,0000  0       1       0
Train 1,0000  1,0000  1,0000  1       0       0
Totals 0,9735  0,9735  0,9735  110     3       3

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-All3DomainsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\TransportationFineGrainedTop100Links.tsv
```

Figure 3.121: All 3 Domains Fine Grained Top 300 Links Runned With Transportation Fine Grained Top 100 Links

3.2. List of experiments

```
CRFClassifier tagged 10336 words in 1 documents at 3459,17 words per second.
Entity P R F1 TP FP FN
Aircraft 1,0000 1,0000 1,0000 1 0 0
Athlete 1,0000 1,0000 1,0000 1 0 0
Coach 1,0000 1,0000 1,0000 1 0 0
PoliticalParty 0,9545 0,8077 0,8750 21 1 5
Politician 1,0000 1,0000 1,0000 4 0 0
PublicTransitSystem 0,8333 0,7143 0,7692 5 1 2
Ship 1,0000 1,0000 1,0000 1 0 0
SportsClub 0,8750 1,0000 0,9333 7 1 0
SportsEvent 1,0000 1,0000 1,0000 1 0 0
SportsLeague 1,0000 1,0000 1,0000 4 0 0
SportsTeam 1,0000 1,0000 1,0000 1 0 0
Totals 0,9400 0,8704 0,9038 47 3 7

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\All3DomainsTop10LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.122: All 3 Domains Fine Grained Top 500 Links Runned With All 3 Domains Fine Grained Top 10 Links

```
CRFClassifier tagged 97089 words in 1 documents at 3675,94 words per second.
Entity P R F1 TP FP FN
Aircraft 1,0000 1,0000 1,0000 23 0 0
Athlete 1,0000 1,0000 1,0000 36 0 0
Automobile 1,0000 1,0000 1,0000 3 0 0
Coach 1,0000 1,0000 1,0000 3 0 0
Infrastructure 1,0000 0,9545 0,9767 21 0 1
PoliticalParty 0,9799 0,9606 0,9701 195 4 8
Politician 1,0000 1,0000 1,0000 55 0 0
PublicTransitSystem 0,9796 0,9231 0,9505 48 1 4
Ship 1,0000 1,0000 1,0000 5 0 0
SpaceShuttle 1,0000 1,0000 1,0000 6 0 0
SpaceStation 1,0000 1,0000 1,0000 1 0 0
SportsClub 0,9529 0,9759 0,9643 81 4 2
SportsEvent 1,0000 0,8837 0,9383 38 0 5
SportsLeague 0,9275 0,9697 0,9481 64 5 2
SportsManager 1,0000 1,0000 1,0000 6 0 0
SportsTeam 1,0000 1,0000 1,0000 33 0 0
Train 1,0000 1,0000 1,0000 1 0 0
Totals 0,9779 0,9657 0,9717 619 14 22

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.123: All 3 Domains Fine Grained Top 500 Links Runned With All 3 Domains Fine Grained Top 100 Links

```
CRFClassifier tagged 270361 words in 1 documents at 2605,86 words per second.
Entity P R F1 TP FP FN
Aircraft 1,0000 1,0000 1,0000 102 0 0
Athlete 1,0000 0,9802 0,9900 198 0 4
Automobile 1,0000 1,0000 1,0000 20 0 0
Coach 1,0000 1,0000 1,0000 4 0 0
Infrastructure 1,0000 0,9640 0,9817 107 0 4
PoliticalParty 0,9718 0,9432 0,9573 482 14 29
Politician 1,0000 1,0000 1,0000 139 0 0
PublicTransitSystem 0,9918 0,9718 0,9817 241 2 7
Ship 1,0000 1,0000 1,0000 15 0 0
SpaceShuttle 1,0000 1,0000 1,0000 6 0 0
SpaceStation 1,0000 1,0000 1,0000 1 0 0
SportsClub 0,9709 0,9625 0,9667 334 10 13
SportsEvent 1,0000 0,8333 0,9091 55 0 11
SportsLeague 0,9551 0,9707 0,9628 298 14 9
SportsManager 1,0000 0,9615 0,9804 50 0 2
SportsTeam 1,0000 0,9805 0,9902 151 0 3
Train 1,0000 1,0000 1,0000 6 0 0
Totals 0,9822 0,9642 0,9731 2209 40 82

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Links\All3DomainsTop300LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.124: All 3 Domains Fine Grained Top 500 Links Runned With All 3 Domains Fine Grained Top 300 Links

3. EXPERIMENTS

```
CRFClassifier tagged 4504 words in 1 documents at 2429,34 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      15
PoliticalParty 0,9545 0,8077 0,8750 21     1      5
Politician 1,0000 0,1111 0,2000 4      0      32
Totals 0,9615 0,3247 0,4854 25     1      52

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\PoliticsFineGrainedTop10Links.tsv
```

Figure 3.125: All 3 Domains Fine Grained Top 500 Links Runned With Politics Fine Grained Top 10 Links

```
CRFClassifier tagged 40673 words in 1 documents at 4212,64 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      164
PoliticalParty 0,9799 0,9606 0,9701 195    4      8
Politician 1,0000 0,1724 0,2941 55     0      264
Totals 0,9843 0,3644 0,5319 250    4      436

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\PoliticsFineGrainedTop100Links.tsv
```

Figure 3.126: All 3 Domains Fine Grained Top 500 Links Runned With Politics Fine Grained Top 100 Links

```
CRFClassifier tagged 107491 words in 1 documents at 2506,26 words per second.
Entity P      R      F1      TP      FP      FN
Election 0,0000 0,0000 0,0000 0      0      322
PoliticalParty 0,9718 0,9432 0,9573 482    14     29
Politician 1,0000 0,1980 0,3305 136    0      551
PublicTransitSystem 0,0000 1,0000 0,0000 0      2      0
Ship 0,0000 1,0000 0,0000 0      1      0
SportsLeague 0,0000 1,0000 0,0000 0      1      0
Totals 0,9717 0,4066 0,5733 618    18     902

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Links\PoliticsFineGrainedTop300Links.tsv
```

Figure 3.127: All 3 Domains Fine Grained Top 500 Links Runned With Politics Fine Grained Top 300 Links

```
CRFClassifier tagged 2854 words in 1 documents at 2679,81 words per second.
Entity P      R      F1      TP      FP      FN
Athlete 1,0000 1,0000 1,0000 1      0      0
Coach 1,0000 1,0000 1,0000 1      0      0
SportsClub 0,8750 1,0000 0,9333 7      1      0
SportsEvent 1,0000 1,0000 1,0000 1      0      0
SportsLeague 1,0000 1,0000 1,0000 4      0      0
SportsTeam 1,0000 1,0000 1,0000 1      0      0
Totals 0,9375 1,0000 0,9677 15     1      0

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\SportFineGrainedTop10Links.tsv
```

Figure 3.128: All 3 Domains Fine Grained Top 500 Links Runned With Sport Fine Grained Top 10 Links

3.2. List of experiments

```
CRFClassifier tagged 31872 words in 1 documents at 4022,72 words per second.
Entity P R F1 TP FP FN
Athlete 1,0000 1,0000 1,0000 36 0 0
Coach 1,0000 1,0000 1,0000 3 0 0
SportsClub 0,9524 0,9756 0,9639 80 4 2
SportsEvent 1,0000 0,8837 0,9383 38 0 5
SportsLeague 0,9275 0,9697 0,9481 64 5 2
SportsManager 1,0000 1,0000 1,0000 6 0 0
SportsTeam 1,0000 1,0000 1,0000 32 0 0
Totals 0,9664 0,9664 0,9664 259 9 9

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\SportFineGrainedTop100Links.tsv
```

Figure 3.129: All 3 Domains Fine Grained Top 500 Links Runned With Sport Fine Grained Top 100 Links

```
CRFClassifier tagged 89224 words in 1 documents at 3135,95 words per second.
Entity P R F1 TP FP FN
Athlete 1,0000 0,9802 0,9900 198 0 4
Coach 1,0000 1,0000 1,0000 4 0 0
Politician 0,0000 1,0000 0,0000 0 2 0
SportsClub 0,9707 0,9622 0,9664 331 10 13
SportsEvent 1,0000 0,8333 0,9091 55 0 11
SportsLeague 0,9582 0,9707 0,9644 298 13 9
SportsManager 1,0000 0,9615 0,9804 50 0 2
SportsTeam 1,0000 0,9804 0,9901 150 0 3
Train 0,0000 1,0000 0,0000 0 1 0
Totals 0,9766 0,9628 0,9696 1086 26 42

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Links\SportFineGrainedTop300Links.tsv
```

Figure 3.130: All 3 Domains Fine Grained Top 500 Links Runned With Sport Fine Grained Top 300 Links

```
CRFClassifier tagged 2978 words in 1 documents at 2749,77 words per second.
Entity P R F1 TP FP FN
Aircraft 1,0000 1,0000 1,0000 1 0 0
PublicTransitSystem 0,8333 0,7143 0,7692 5 1 2
Ship 1,0000 1,0000 1,0000 1 0 0
Totals 0,8750 0,7778 0,8235 7 1 2

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top10Links\TransportationFineGrainedTop10Links.tsv
```

Figure 3.131: All 3 Domains Fine Grained Top 500 Links Runned With Transportation Fine Grained Top 10 Links

```
CRFClassifier tagged 24544 words in 1 documents at 3821,86 words per second.
Entity P R F1 TP FP FN
Aircraft 1,0000 1,0000 1,0000 23 0 0
Automobile 1,0000 1,0000 1,0000 3 0 0
Infrastructure 1,0000 0,9545 0,9767 21 0 1
PublicTransitSystem 0,9796 0,9231 0,9505 48 1 4
Ship 1,0000 1,0000 1,0000 5 0 0
SpaceShuttle 1,0000 1,0000 1,0000 6 0 0
SpaceStation 1,0000 1,0000 1,0000 1 0 0
SportsClub 0,0000 1,0000 0,0000 0 1 0
SportsTeam 0,0000 1,0000 0,0000 0 1 0
Train 1,0000 1,0000 1,0000 1 0 0
Totals 0,9730 0,9558 0,9643 108 3 5

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\TransportationFineGrainedTop100Links.tsv
```

Figure 3.132: All 3 Domains Fine Grained Top 500 Links Runned With Transportation Fine Grained Top 100 Links

3. EXPERIMENTS

```
CRFClassifier tagged 73646 words in 1 documents at 3209,68 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 1,0000 1,0000 1,0000 102    0      0
Automobile 1,0000 1,0000 1,0000 20     0      0
Infrastructure 1,0000 0,9640 0,9817 107    0      4
Politician 0,0000 1,0000 0,0000 0       1      0
PublicTransitSystem 0,9917 0,9715 0,9815 239    2      7
Ship 1,0000 1,0000 1,0000 14     0      0
SpaceShuttle 1,0000 1,0000 1,0000 6       0      0
SpaceStation 1,0000 1,0000 1,0000 1       0      0
SportsClub 0,0000 1,0000 0,0000 0       3      0
SportsTeam 0,0000 1,0000 0,0000 0       1      0
Train 1,0000 1,0000 1,0000 5       0      0
Totals 0,9860 0,9782 0,9821 494    7      11

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-All3DomainsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Links\TransportationFineGrainedTop300Links.tsv
```

Figure 3.133: All 3 Domains Fine Grained Top 500 Links Runned With Transportation Fine Grained Top 300 Links

```
CRFClassifier tagged 97089 words in 1 documents at 7883,80 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 0,0000 0,0000 0       0      23
Athlete 0,0000 0,0000 0,0000 0       0      36
Automobile 0,0000 0,0000 0,0000 0       0      3
Coach 0,0000 0,0000 0,0000 0       0      3
Election 0,0000 1,0000 0,0000 0      136    0
Infrastructure 0,0000 0,0000 0,0000 0       0      22
PoliticalParty 0,7831 0,7291 0,7551 148    41     55
Politician 0,1541 0,9273 0,2642 51     280    4
PublicTransitSystem 0,0000 0,0000 0,0000 0       0      52
Ship 0,0000 0,0000 0,0000 0       0      5
SpaceShuttle 0,0000 0,0000 0,0000 0       0      6
SpaceStation 0,0000 0,0000 0,0000 0       0      1
SportsClub 0,0000 0,0000 0,0000 0       0      83
SportsEvent 0,0000 0,0000 0,0000 0       0      43
SportsLeague 0,0000 0,0000 0,0000 0       0      66
SportsManager 0,0000 0,0000 0,0000 0       0      6
SportsTeam 0,0000 0,0000 0,0000 0       0      33
Train 0,0000 0,0000 0,0000 0       0      1
Totals 0,3034 0,3105 0,3069 199    457    442

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-PoliticsTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.134: Politics Fine Grained Top 300 Links Runned With All 3 Domains Fine Grained Top 100 Links

```
CRFClassifier tagged 97089 words in 1 documents at 5175,60 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 0,0000 0,0000 0       0      23
Athlete 0,0000 0,0000 0,0000 0       0      36
Automobile 0,0000 0,0000 0,0000 0       0      3
Coach 0,0000 0,0000 0,0000 0       0      3
Election 0,0000 1,0000 0,0000 0      163    0
Infrastructure 0,0000 0,0000 0,0000 0       0      22
PoliticalParty 0,9652 0,9557 0,9604 194    7       0
Politician 0,1471 1,0000 0,2564 55     319    0
PublicTransitSystem 0,0000 0,0000 0,0000 0       0      52
Ship 0,0000 0,0000 0,0000 0       0      5
SpaceShuttle 0,0000 0,0000 0,0000 0       0      6
SpaceStation 0,0000 0,0000 0,0000 0       0      1
SportsClub 0,0000 0,0000 0,0000 0       0      83
SportsEvent 0,0000 0,0000 0,0000 0       0      43
SportsLeague 0,0000 0,0000 0,0000 0       0      66
SportsManager 0,0000 0,0000 0,0000 0       0      6
SportsTeam 0,0000 0,0000 0,0000 0       0      33
Train 0,0000 0,0000 0,0000 0       0      1
Totals 0,3374 0,3885 0,3611 249    489    392

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-PoliticsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.135: Politics Fine Grained Top 500 Links Runned With All 3 Domains Fine Grained Top 100 Links

3.2. List of experiments

```
CRFClassifier tagged 270361 words in 1 documents at 4572,62 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 0,0000 0,0000 0      0      102
Athlete 0,0000 0,0000 0,0000 0      0      202
Automobile 0,0000 0,0000 0,0000 0      0      20
Coach 0,0000 0,0000 0,0000 0      0      4
Election 0,0000 1,0000 0,0000 0      337      0
Infrastructure 0,0000 0,0000 0,0000 0      0      111
PoliticalParty 0,9569 0,9550 0,9559 488      22      23
Politician 0,1518 0,9784 0,2628 136      760      3
PublicTransitSystem 0,0000 0,0000 0,0000 0      0      248
Ship 0,0000 0,0000 0,0000 0      0      15
SpaceShuttle 0,0000 0,0000 0,0000 0      0      6
SpaceStation 0,0000 0,0000 0,0000 0      0      1
SportsClub 0,0000 0,0000 0,0000 0      0      347
SportsEvent 0,0000 0,0000 0,0000 0      0      66
SportsLeague 0,0000 0,0000 0,0000 0      0      307
SportsManager 0,0000 0,0000 0,0000 0      0      52
SportsTeam 0,0000 0,0000 0,0000 0      0      154
Train 0,0000 0,0000 0,0000 0      0      6
Totals 0,3580 0,2724 0,3094 624      1119      1667

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top500Links\ner-PoliticsTop500LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top300Links\All3DomainsTop300LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.136: Politics Fine Grained Top 500 Links Runned With All 3 Domains Fine Grained Top 300 Links

```
CRFClassifier tagged 97089 words in 1 documents at 5454,44 words per second.
Entity P      R      F1      TP      FP      FN
Aircraft 0,0000 0,0000 0,0000 0      0      23
Athlete 0,2817 0,5556 0,3738 20      51      16
Automobile 0,0000 0,0000 0,0000 0      0      3
Coach 1,0000 0,6667 0,8000 2      0      1
Infrastructure 0,0000 0,0000 0,0000 0      0      22
PoliticalParty 0,0000 0,0000 0,0000 0      0      203
Politician 0,0000 0,0000 0,0000 0      0      55
PublicTransitSystem 0,0000 0,0000 0,0000 0      0      52
Ship 0,0000 0,0000 0,0000 0      0      5
SpaceShuttle 0,0000 0,0000 0,0000 0      0      6
SpaceStation 0,0000 0,0000 0,0000 0      0      1
SportsClub 0,8795 0,8795 0,8795 73      10      10
SportsEvent 0,9706 0,7674 0,8571 33      1      10
SportsLeague 0,8852 0,8182 0,8504 54      7      12
SportsManager 0,5000 1,0000 0,6667 6      6      0
SportsTeam 0,9583 0,6970 0,8070 23      1      10
Train 0,0000 0,0000 0,0000 0      0      1
Totals 0,7352 0,3292 0,4547 211      76      430

C:\Dev\stanford-ner-2017-06-09>java -Xmx11g -cp stanford-ner.jar edu.stanford.nlp.ie.crf.CRFClassifier -loadClassifier modelsWithOneAnnotation\Top300Links\ner-SportTop300LinksFineGrained.ser.gz -testFile domainsWithOneAnnotation\Top100Links\All3DomainsTop100LinksTextWithSameProcessedLinksOnAbstractFineGrainedSpecified.tsv
```

Figure 3.137: Sport Fine Grained Top 300 Links Runned With All 3 Domains Fine Grained Top 100 Links

3. EXPERIMENTS

3.3 Summary of results

3.3.1 Graphs

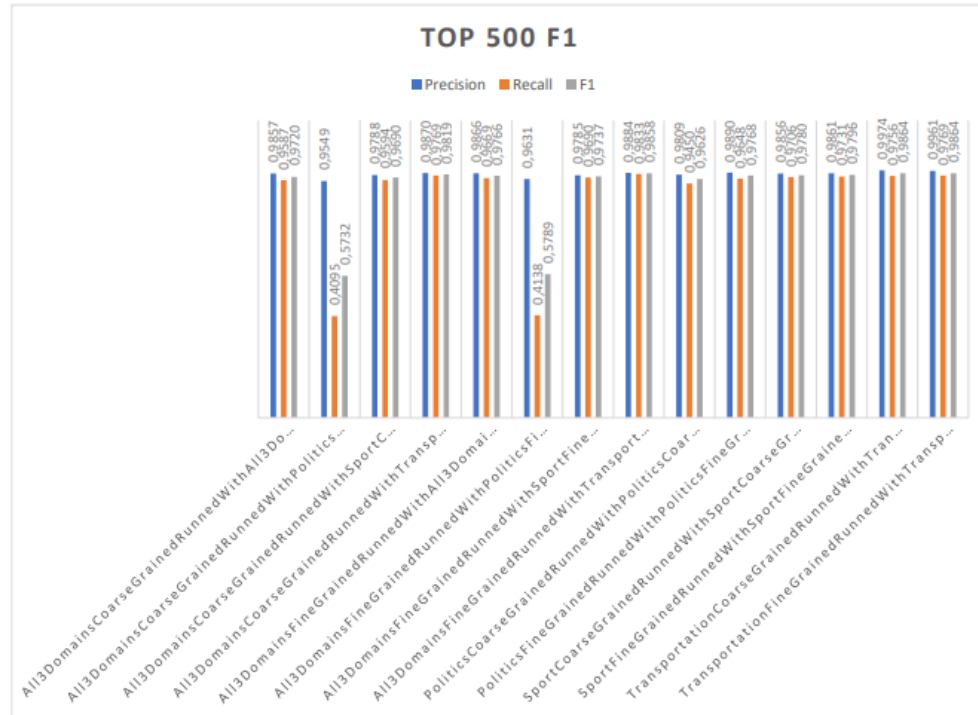


Figure 3.138: Top 500 Links F1

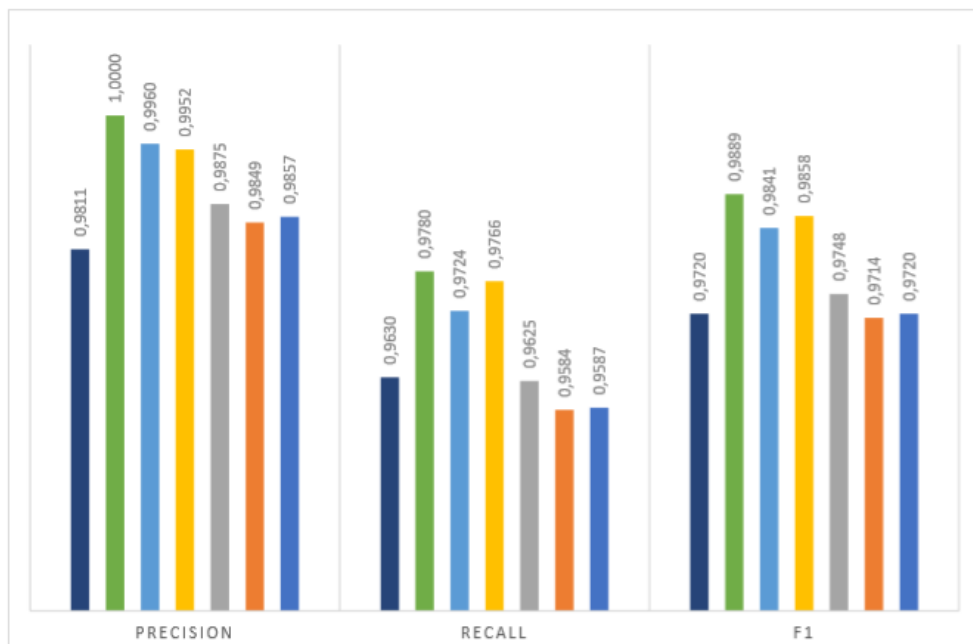


Figure 3.139: All 3 Domains Coarse Grained Runned With All 3 Domains Coarse Grained-tsv F1

Conclusion

Contents of CD