Predicting MT Fluency from IE Precision and Recall

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ISLE Keywords

- Quality of output text as a whole
  - – Fluency (itself as a predictor of fidelity)
  - – Utility of output for IE
- Automation
- F-score, Precision, Recall,

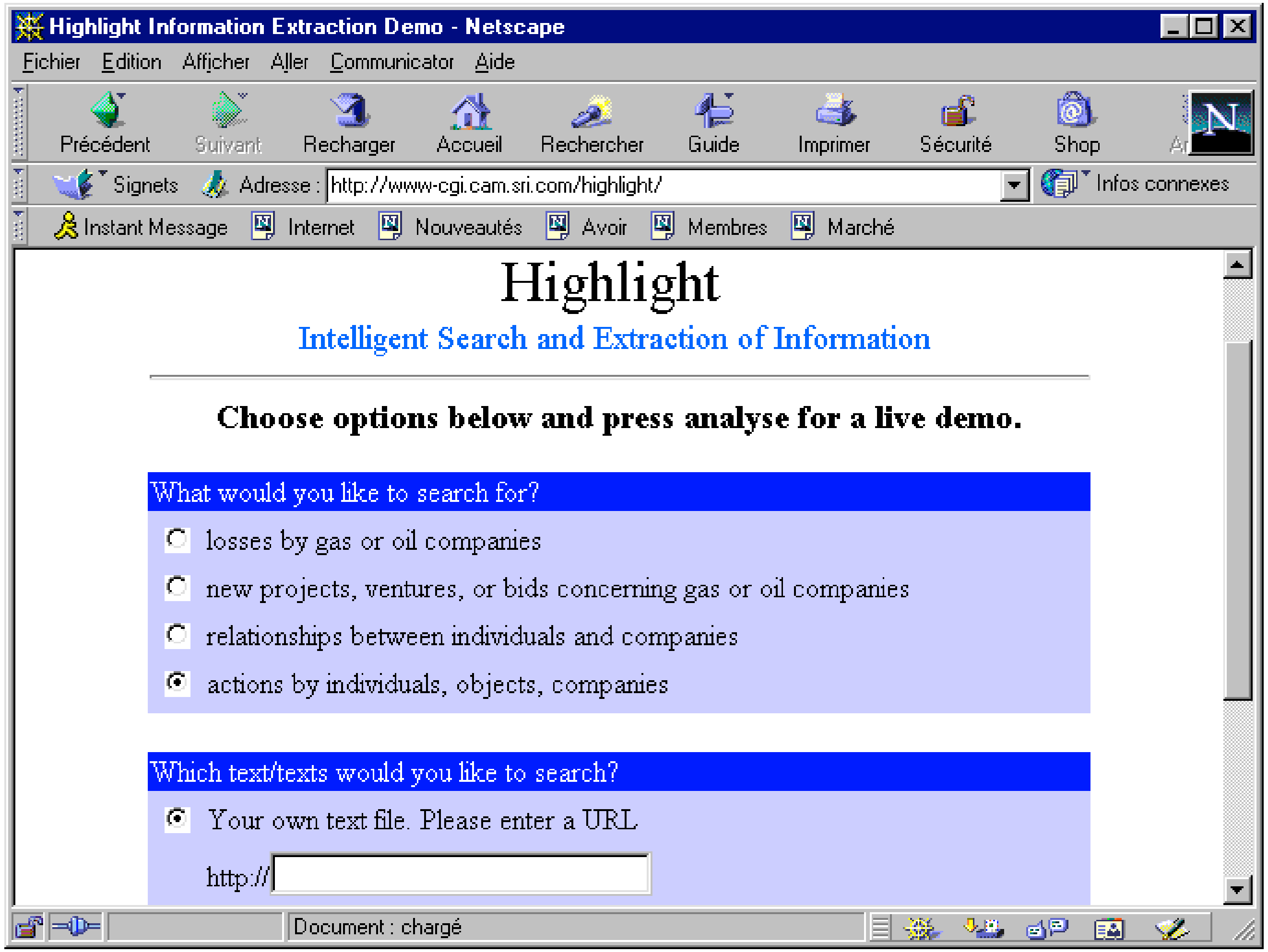
Data Sources

- Fluency
  - DARPA 94 scores for French => English
  - 100 source texts * (1 HT + 5 MT)
- IE
  - Output from SRI *Highlight* engine
  - **`http://www-cgi.cam.sri.com/highlight/`**

Data Sampling

- Select 3 ‘systems’
  - – Human expert -- mean fluency: 0.851934
  - – S1 -- highest mean fluency: 0.508431
  - – S2 -- lowest mean fluency: 0.124882
- Cover ‘best to worse’ for each
  - – Aim -- select 20 texts
  - – Actual -- 17 texts

IE Task


Highlight Information Extraction Demo - Netscape
Fichier Edition Afficher Aller Communicator Aide
Précédent Suivant Recharger Accueil Rechercher Guide Imprimer Sécurité Shop
Signets Adresse : http://www-cgi.cam.sri.com/highlight/
Infos connexes
Instant Message Internet Nouveautés Avoir Membres Marché
Document : chargé

Highlight

Intelligent Search and Extraction of Information

Choose options below and press analyse for a live demo.

What would you like to search for?

○ losses by gas or oil companies

○ new projects, ventures, or bids concerning gas or oil companies

○ relationships between individuals and companies

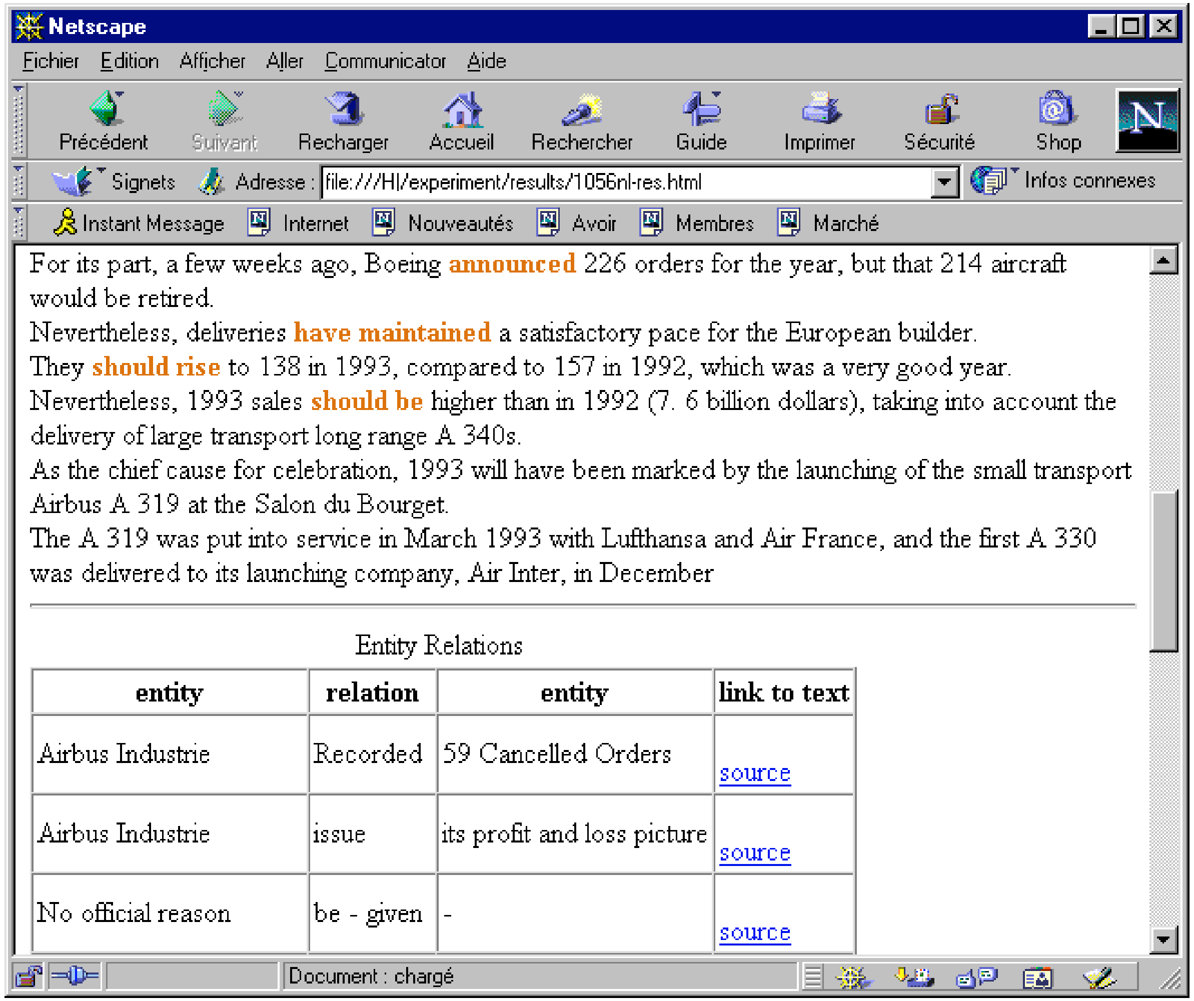
● actions by individuals, objects, companies

Which text/texts would you like to search?

● Your own text file. Please enter a URL

http://

IE Output


Netscape
Fichier Edition Afficher Aller Communicator Aide
Précédent Suivant Recharger Accueil Rechercher Guide Imprimer Sécurité Shop
Signets Adresse : file:///H|/experiment/results/1056nl-res.html
Infos connexes
Instant Message Internet Nouveautés Avoir Membres Marché
Document : chargé

For its part, a few weeks ago, Boeing **announced** 226 orders for the year, but that 214 aircraft would be retired.
Nevertheless, deliveries **have maintained** a satisfactory pace for the European builder.
They **should rise** to 138 in 1993, compared to 157 in 1992, which was a very good year.
Nevertheless, 1993 sales **should be** higher than in 1992 (7. 6 billion dollars), taking into account the delivery of large transport long range A 340s.
As the chief cause for celebration, 1993 will have been marked by the launching of the small transport Airbus A 319 at the Salon du Bourget.
The A 319 was put into service in March 1993 with Lufthansa and Air France, and the first A 330 was delivered to its launching company, Air Inter, in December

Entity Relations

entity	relation	entity	link to text
Airbus Industrie	Recorded	59 Cancelled Orders	source
Airbus Industrie	issue	its profit and loss picture	source
No official reason	be - given	-	source

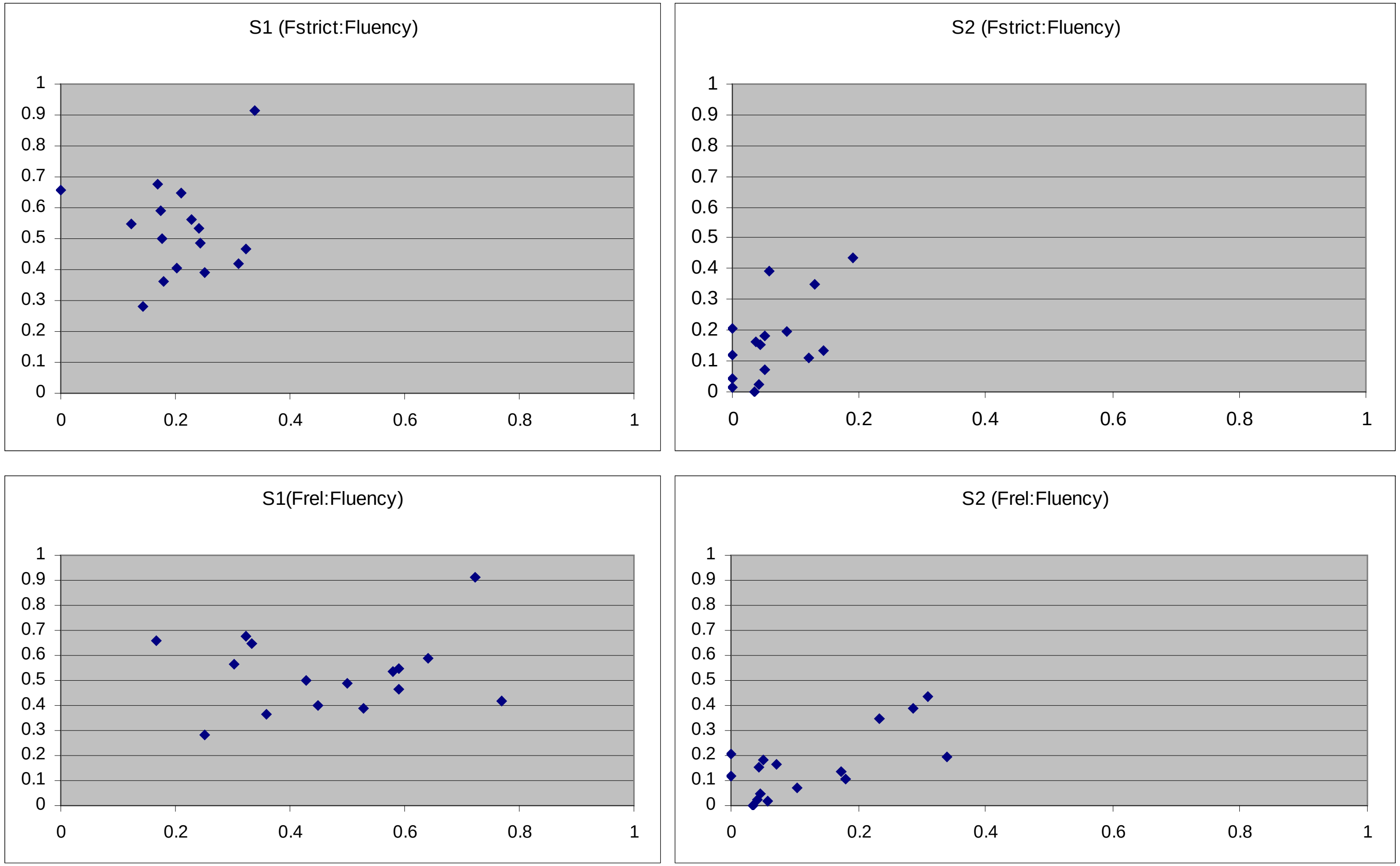
IE Scoring

- Manual, but using simple, objective rules
- ‘Gold Standard’ given by expert translation
  - number of cells filled
- ‘Strict’ match = identity
- ‘Relaxed’ match = near miss
  - *quarter :: third school quarter*
  - *hoped :: wished*
  - *Airbus Industrie :: Airbus industry*

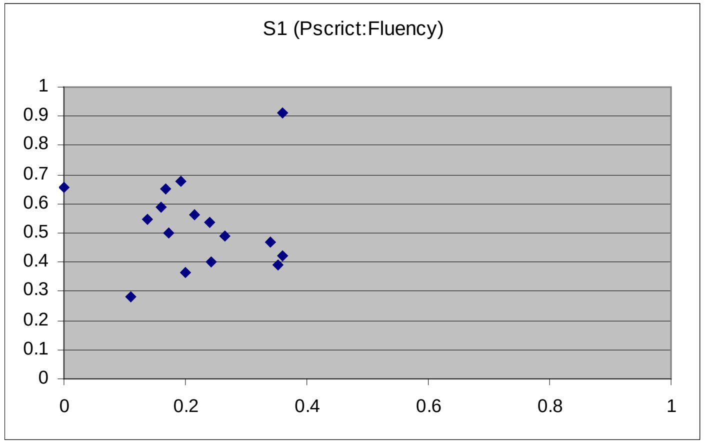
Precision and Recall

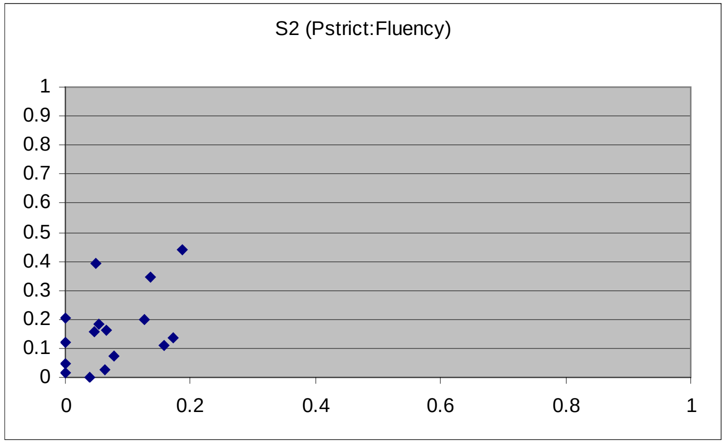
- Precision *P*
  - (correct cells / actual cells)
- Recall *R*
  - (actual cells / reference cells)
- F-score
  - 2 * P * R / (P + R)

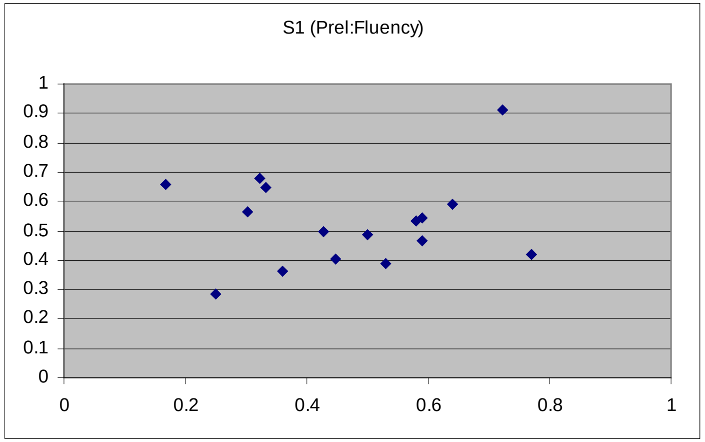
Correlations (not): F-score

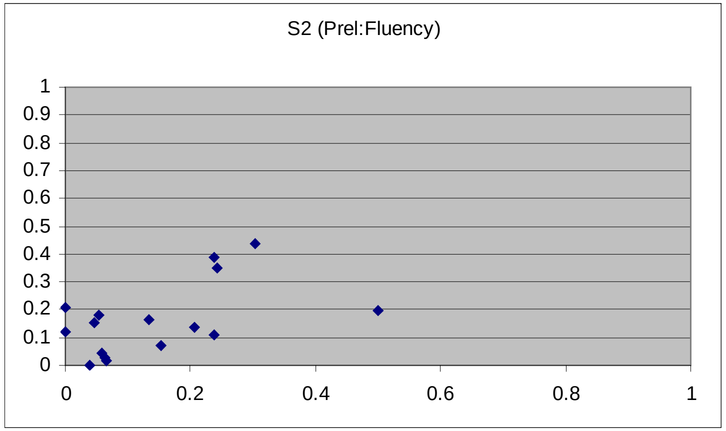


Correlations (not): Precision

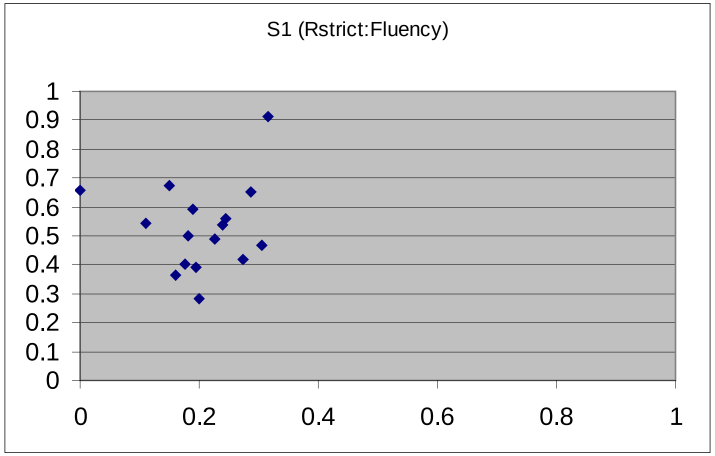

S1 (Pscrict:Fluency)

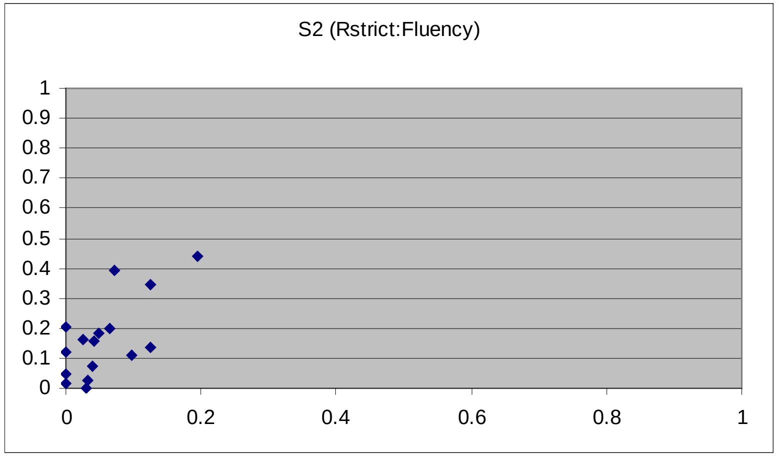

S2 (Pstrict:Fluency)

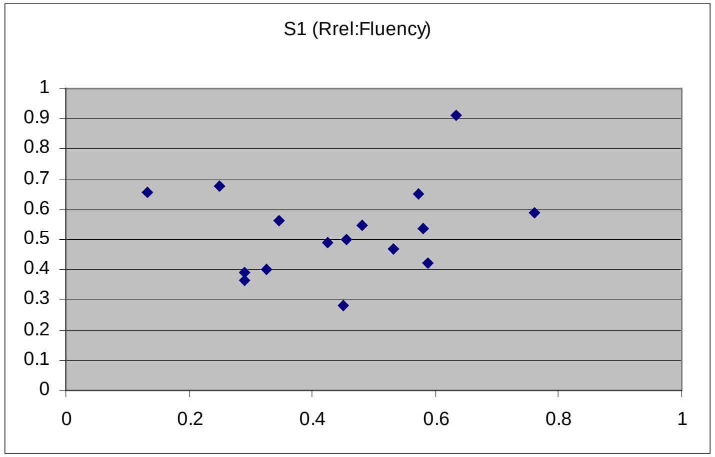

S1 (Prel:Fluency)

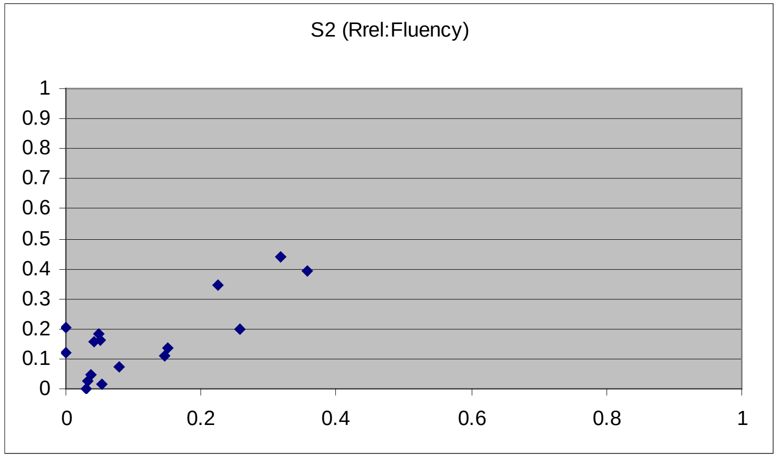

S2 (Prel:Fluency)

Correlations (not): Recall


S1 (Rstrict:Fluency)


S2 (Rstrict:Fluency)


S1 (Rrel:Fluency)


S2 (Rrel:Fluency)

Conclusions

- A significant correlation is observed for S2 (for precision and recall)
- The same is not true for S1!…
- For S1, the correlation is higher for the F score than for P and R scores

Observations on translation data

- MT yields structure preservation by default
- Does ‘free-ness’ of expert translation tarnish Gold Standard?
  - – Finite verb in ST => non-finite verb in TT (IE under-retrieves)
  - – Nominalisation in ST => finite verb in TT (IE over-retrieves)

Observations on IE data

- Poor performance of *Highlight*
  - particularly on expert translations?
- Long distances between Entities and Relator
  - post-modification of NP
  - parenthetical material

Next Steps

- Correlate with Adequacy rather than Fluency?
- Use whole data set (S2 bad choice?)
- Focus on extracted doubles and triples rather than single cells?
- Use another IE engine?
- Use ST to establish Gold Standard?