

Annotation Scheme for Social Network Extraction

Apoorv Agarwal
Owen Rambow
Rebecca J. Passoneau
Columbia University

August 4, 2010

Extract Social Networks out of texts

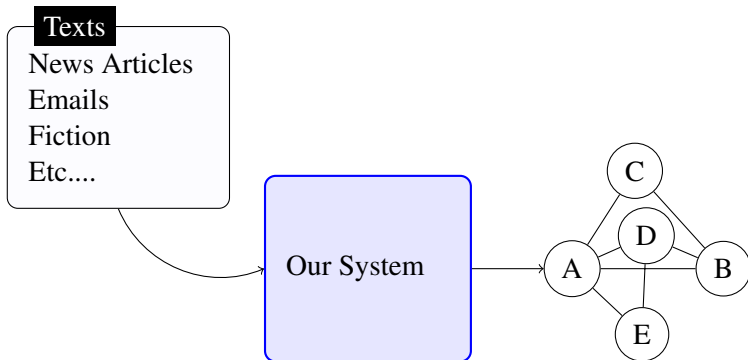


Figure: System that extracts Social Networks out of texts

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- Perception (PCR): seeing on TV, magazine

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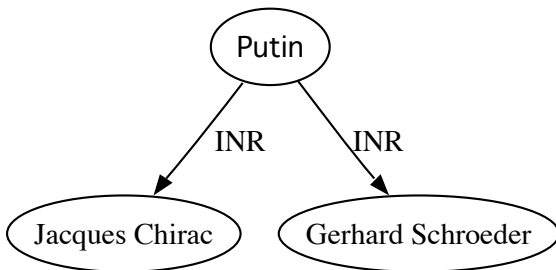
- Interaction (INR): talking, meeting
- Physical Proximity (PPR): seeing, suicide-bombing
- Perception (PCR): seeing on TV, magazine
- Cognition (COG): thinking, loving, missing

Example

Putin concluded his two days of **talks in St. Petersburg** with **Jacques Chirac** of France and Chancellor **Gerhard Schroeder** on Saturday still urging for a central role for the UN in a post-war revival of Iraq

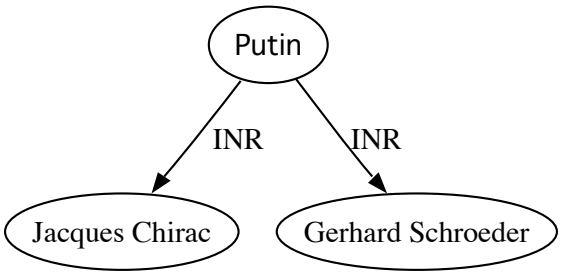
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- We do not consider transitive or inferred events (No link between Chirac and Schroeder)

Outline

- Motivation

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Summarization, Question Answering

How are characters clustered according to their structural properties?

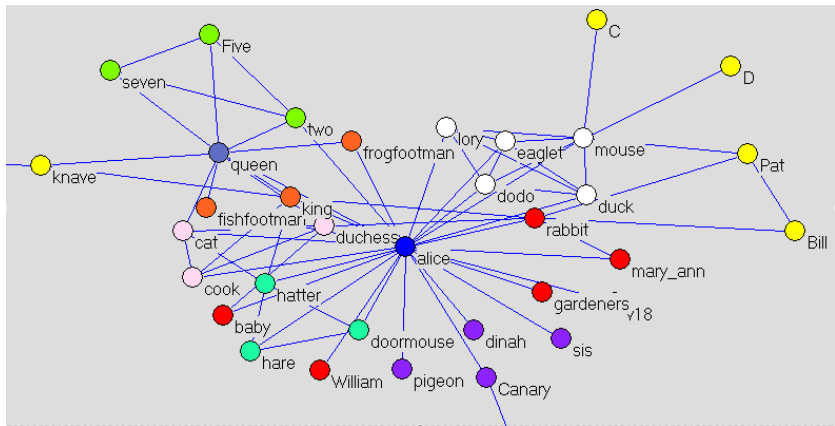


Figure: Block-modelling: Social positions and roles

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Automatic Content Extraction (ACE)

Annotate newswire, broadcast conversation, and weblogs with
Entities, Relations and Events.

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- Person: Individual human being or a group of human beings
- Organization: Agencies, Corp. (Organizational structures)
- Geo-political: Geo. regions defined by political/social groups
- Location: Geographical land-masses, bodies of water etc.
- Facility: Buildings and other man-made structures

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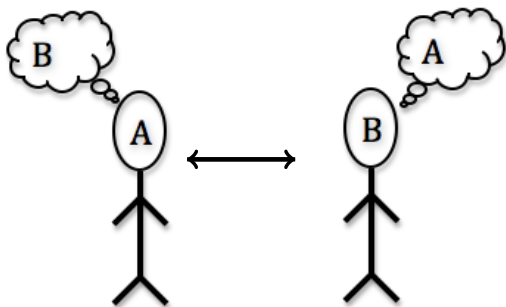
- We are not concerned with ACE Relations
- We will see shortly what are the ACE Events and how our annotations are different

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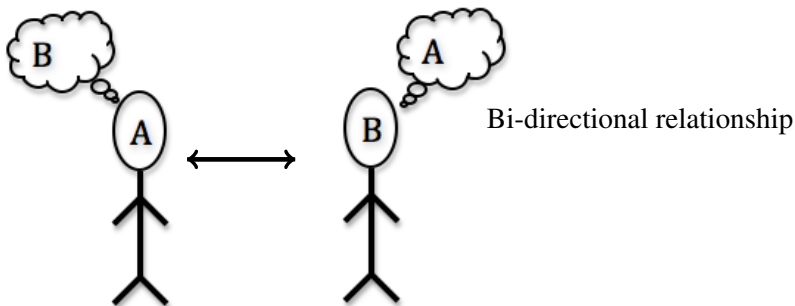
Interaction Relation (INR)

Definition: Two entities have an interaction relation if both entities are mutually aware of their *presence* and the *event* taking place between the entities



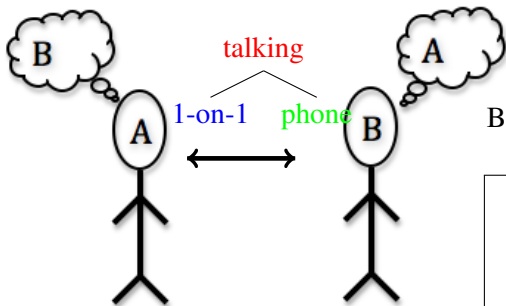
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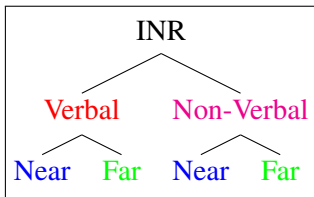


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Bi-directional relationship



Examples of INR

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Within weeks **he** was arrested and charged with **sodomizing** an official **driver** . . . INR.Nonverbal-Near

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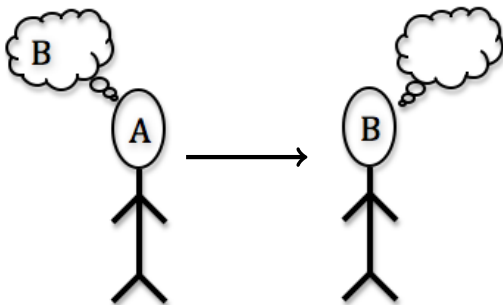
Within weeks **he** was arrested and charged with **sodomizing** an official **driver** . . . INR.Nonverbal-Near

The writer will retain the rights to his books and films, although **he** has agreed to **split a raft of possessions** with **Anne Marie** . . . INR.Nonverbal-Far

Physical Proximity Relation (PPR)

Definition: Entities are said to have a physical proximity relation if:

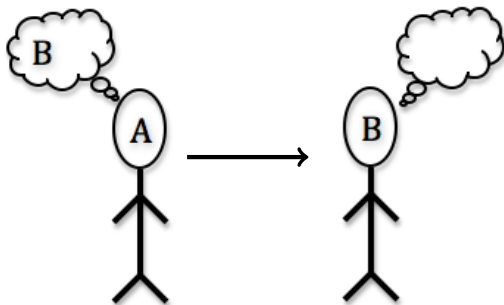
- ① only one entity is aware of the other entity AND
- ② one entity can see/observe the other live



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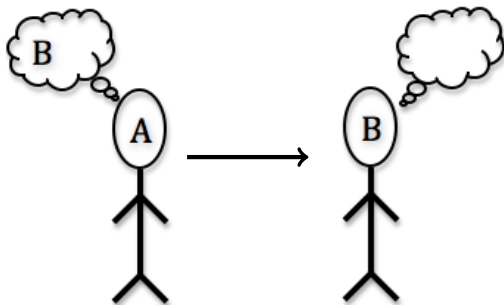


Directed relationship

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Directed relationship



Examples of PPR

Alice saw the Rabbit running by her

PPR

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W. Rabbit ran by Alice

No Annotation

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Alice saw the Rabbit running by her

PPR

W. Rabbit ran by Alice

No Annotation

Fifteen people were killed and more than 30 wounded as a suicide bomber blew himself up . . .

PPR

Perception Relation (PCR)

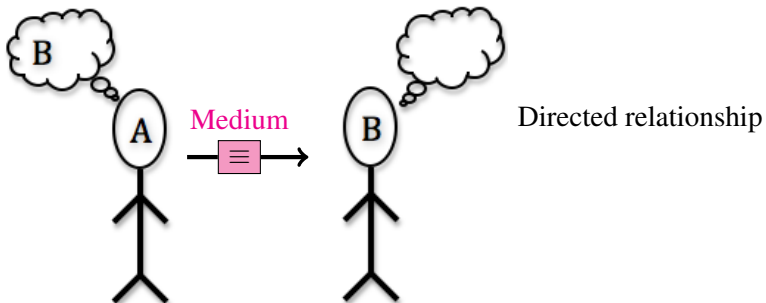
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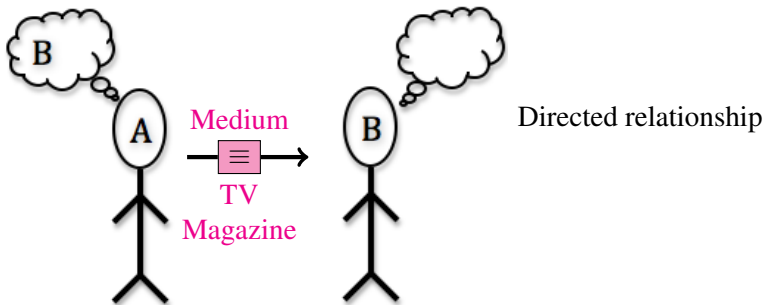
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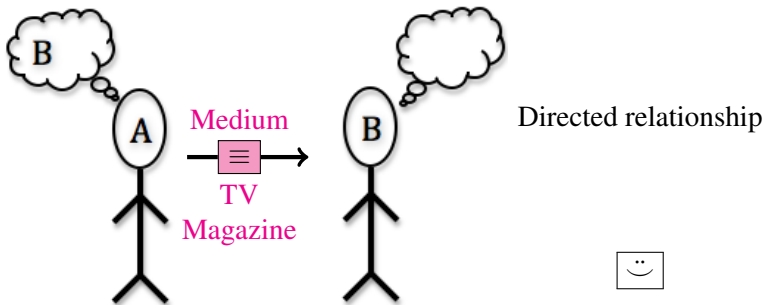
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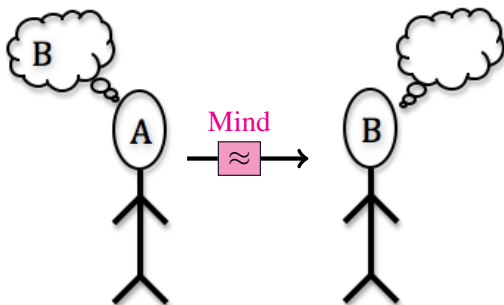
Examples of PCR

The **pair** flew to Singapore last year after **hearing** of the successful surgery on Nepalese babies **Ganga** and **Jamuna Shrestha** . . . **PCR**

Cognition Relation (COG)

Definition: Entities are said to have a cognition relation if:

- 1 an entity is aware of the other entity AND
- 2 relation is NOT PPR or PCR

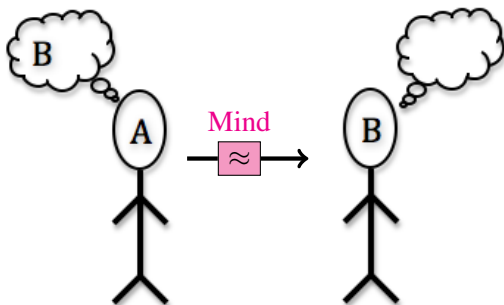


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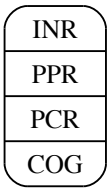
Examples of COG

The **police** **say** the **bomber** blew himself up outside this cafe **COG**

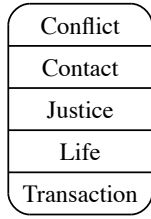
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Comparison with ACE Events

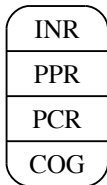


A

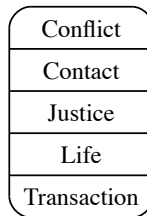


B

Comparison with ACE Events



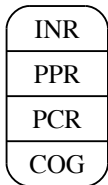
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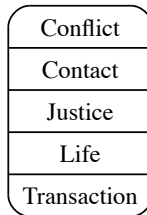
B

- $A \subset B$ (No need for our annotations)

Comparison with ACE Events



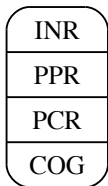
A



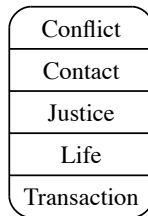
B

- $A \subset B$ (No need for our annotations)
- $A_{Type_i} \subset B$ (No need for part of our annotations)

Comparison with ACE Events



A



B

- $A \subset B$ (No need for our annotations)
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In fact, neither of these scenarios happens \implies our annotations are different from ACE

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- However, there is some overlap; mainly INR ↔ Contact
- Specifically, ACE captures “meeting” events that are INR for us
- But our definition of INR is broader:

Toujan Faisal, 54, said she was informed of the refusal by an Interior Ministry committee overseeing election preparations.

INR. Verbal-Far

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- Two annotators, 62 documents, ACE-2005 corpus

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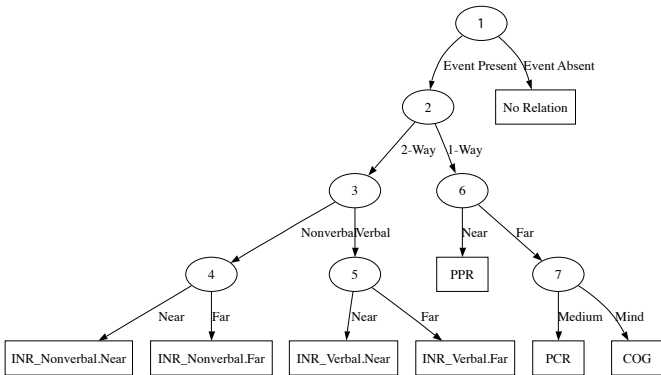


Figure: Decision points an annotator goes through for selecting type and sub-type of social events.

Inter-annotator Agreement

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	Yes _{Ann₂}	No _{Ann₂}
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Table: Confusion Matrix

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Table: Confusion Matrix

- $Kappa = \frac{P(a) - P(e)}{1 - P(e)}$

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|--------------------------------|--------------------------------|-------------------------------|
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Table: Confusion Matrix

- $Kappa = \frac{P(a) - P(e)}{1 - P(e)}$
- $F - measure = \frac{2PR}{P+R}; P = \frac{tp}{tp+fp}; R = \frac{tp}{tp+fn}$

Inter-annotator Agreement

Decision Point	Confusion Matrix				Kappa	F1
	tp	fp	fn	tn		
1 (+/- Relation)	133	31	34	245	0.68	0.80
2 (1 or 2 way)	51	8	1	73	0.86	0.91
3 (Verbal/NonV)	40	4	0	7	0.73	0.95
4 (NonV-Near/Far)	6	0	1	0	0.00	0.92
5 (Verbal-Near/Far)	30	1	2	7	0.77	0.95
6 (+/- PPR)	71	0	1	1	0.66	0.99
7 (PCR/COG)	69	1	1	0	-0.01	0.98

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Conclusion

- Presented an annotation scheme for social network extraction from text where social events are based on cognitive states of people involved
- Showed our annotations are novel (compared with ACE)
- Reported IAA measures that show our annotations are reliable

Future Work

- Extend manual for entity annotation: *Mouse was talking to Dodo, Duck etc. He said to **them** . . .*
- Extend manual for social event annotation: *The Mouse said to Alice, “Oh! Mary Ann”*
- Annotate sentiment on already annotated social events

Acknowledgements

- David Elson for helping us with the annotation manual and reviewing the paper
- Natural Language Processing Group at Columbia University for useful comments on our annotation scheme

Thanks!

Backup Slides

Callisto - XIN_ENG_20030616.0274.apf.trunc.xml

File Edit Format Tools Help

It said that the EU was seriously concerned about Iran's nuclear activities and urged it to cooperate fully with the IAEA.

"This would be a significant step in demonstrating Iran's stated peaceful intentions with regard to its nuclear program," the seven-point statement said.

George Papandreou, foreign minister of Greece, the current holder of the EU presidency, said he was in personal contact with IAEA Director-General Mohamed ElBaradei and would follow his lead on this matter.

EU foreign ministers reiterated that improved trade links with Iran

Entities Entity Mentions Relation Mentions Event Mentions

ID	Primary Refer...	Mentions	Type	Subtype	Class
E1	minister	3	PER	Individual	SPC
E9	Mohamed ElBar...	3	PER	Individual	SPC

Backup Slides

62 Documents			Conflict (5)		Contact (32)		Justice-* (13)	Life (7)			Transaction (2)	Not Found
			Attack	Meet	Phone-Write	Die		Divorce	Injure	Transfer-Money		
INR	Verbal	Near (66)	0	26	0	9	0	0	0	0	0	31
		Far (17)	0	0	3	3	0	1	0	0	0	10
	NonVerbal	Near (14)	3	0	0	0	2	0	0	1	0	8
		Far (3)	0	0	0	0	0	0	0	1	0	2
COG (109)			2	0	0	0	1	0	0	0	0	106
PPR (2)			0	0	0	0	1	0	1	0	0	0
PCR (1)			0	0	0	0	0	0	0	0	0	1
Errors			0	3	0	1	1	0	0	0	0	

Backup Slides

Sender → Receiver	Email content
Kate → Sam	[Jacob], the City attorney had a couple of questions which [I] will {attempt to relay} without having a copy of the documents.
Sam → Kate, Mary	Can you obtain the name of Glendale’s bond counsel (lawyer’s name, phone number, email, etc.)?
Kate → Sam	Glendale’s City Attorney is Jacob. Please let [me] {know} if [you] need anything else.
Mary → Sam	I do not see a copy of an opinion in the file nor have we received one since [I] {sent} the execution copies of the ISDA to [Jacob].
Kate → Jacob	Jacob, could you provide the name, phone number, etc. of your bond council for our attorney, Sam?
Kate → Sam	[I] will {work on this for} [you] - and will be in touch.

