Off to a Cold Start
a few observations

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Cold Start > Slot Filling + Entity Linking

- Surprise!

- Cold Start can be very surprising

Cold Start	Slot Fillimg
New (surprise) sources	(Mostly) established sources
New corpus each time	Corpus changes gradually
Slot mix unpredictable	Slot mix broadens gradually

Slot Filling

- Relative importance of slots changes little from year to year

2012 SF

2013 SF

slot	# of equivalence classes
per:title	236
org:top_members_employees	177
per:member_of	107
per:children	100
org:alternate_names	96
per:employee_of	72
per:cities_of_residence	62
org:subsidiaries	59

slot	# of equivalence classes
per:title	230
org:top_members_employees	130
per:employee_or_member_of	125
org:alternate_names	89
per:alternate_names	63
per:children	57
per:cities_of_residence	53
per:age	51

Cold Start Topics

- 2012: University of Pennsylvania

- 2013: Kentucky and Florida news

Cold Start: main slots

2012

slot	frequency in responses
org:students	441 (18.16%)
org:employees	407 (16.76%)
per:title	337 (13.88%)
per:employee_of	223 (9.18%)
per:schools_attended	173 (7.13%)
org:top_members_employees	101 (4.16%)
org:membership	97 (4.00%)

Cold Start: main slots

2013

Slot	Frequency in response
Gpe:residents of city	693 (16%)
Gpe:employees_or_members	570 (13%)
Org:employees_or_members	555(13%)
Per:title	425(10%)
Per:employee_or_member_of	199 (4%)
Gpe:headquarters_in_city	196 (4%)
Org;TOP-members_employees	155 (4%)

Frequent Expressions (I)

- For 2012, the *students* relation was expressed most often by

person received his/her PhD. [in ...] from/at *school*

- Over 100 instances of this pattern
  - Whether you recognize this pattern significantly affects your score

Frequent Expressions (II)

- For 2013, thanks to the *Times-Tribune*, city_of_residence is expressed very often by the pattern

> *person, [age],* of *city*

- Of 1788 responses assessed as correct by LDC, 293 were city_of_residence relations involving this pattern

  – This pattern alone was worth 25 % 0-hop F1

- For Cold Start, a significant challenge is dealing with sources you have never seen before
  - can we recognize common but unexpected patterns in the text corpus?

Named Entities

- Cold Start is more sensitive to NE errors than Slot Filling
  - In Slot Filling, system is given query name, span, and type
  - In Cold Start, system has no prior information on names when constructing the KB
- If tagger misses the query name or assigns the wrong type, there will be no query response

NE: A Significant Effect

- For NYU, initially affected 37% of query variants

- Reduced to 27% by shifting to a more robust tagger (HMM with 6 states / name type)

- Need to select NE which works well on a wide range of inputs
  - More important than good performance on text similar to training data

- Possibly allow KBs which are uncertain about some name extents and types
  - Resolved at query time