

AGILE PhD School 7th Edition – ‘GeoAI for the Social Good’

PhD Project Title

Exploring How Place Reputation is Constructed in Subreddits using Platial-Knowledge Graphs

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Motivation

1. Difficulty in extracting spatial information from unstructured social media text
2. Ambition to integrate place into GeoKGs however challenge in representing 'vagueness' or perceptions of place
3. Help further understanding of place reputation within an urban environment
 - GeoKGs can model how people perceive liveability of places within an urban environment



Research Aims


A1 – Represent social media platial information into a geospatial knowledge graph through ontology

A2 - Extract relational knowledge between platial entities using LLMs

A3 - Measure place reputation using Reddit data and a geospatial knowledge graph

A4 - Build GeoAI model to predict place reputation



 r/Leeds · 28d ago


Who lives in Primley park/Alwoodley?

0 votes · 8 comments

 r/Leeds · 23d ago


How are Moortown, Harehills, Chapeltown and Chapel Allerton to live in?

0 votes · 13 comments

 r/Leeds · 20d ago

What's Cross Gates like to live?

3 votes · 25 comments

 **Timmymagic1** · 27d ago


Its not cheap, but not as expensive as you'd think...until you get to the houses on and just off Alwoodley Lane and Wigton Lane...

If you're renting its surprisingly affordable...

Very quiet, peaceful and safe...but the flipside is there are very, very few pubs...

Lived there for 6 years, until very recently, my partner still lives there.

 1   Reply  Award  Share ...

 **thisishardcore_** · 22d ago


Moortown - Nice and quiet, plenty on your doorstep, a little further out of town but decent transport links and close to the Ring Road/A61.

Chapel Allerton - Perfect for young professionals, plenty of restaurants, bars, etc. Always something going on.

Chapeltown - Has a bad reputation and it's certainly not perfect, but it isn't as bad as it was 15-20 years ago.

Harehills - Just no.

  3   Reply  Award  Share ...

 **Proud-Drummer** · 20d ago

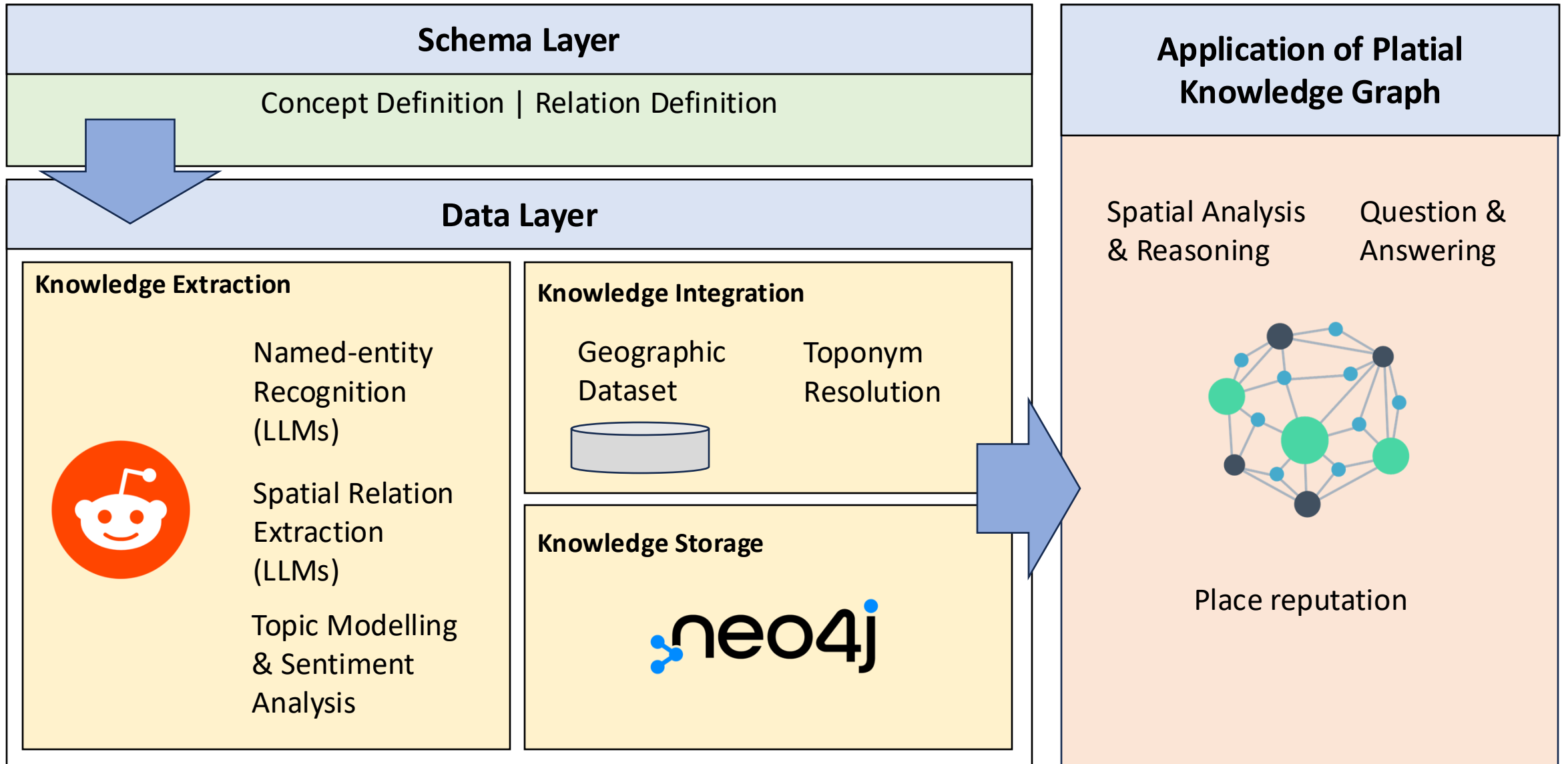
It's pretty good. Train station, close to Temple Newsam, amenities close by, close to The Springs, good access to motorway, lots of new builds housing in the area so likely a bit of a developing area.

 25   Reply  Award  Share ...

r/Leeds 'live' search



Potential Methodological Framework



Preliminary Work

NER

Model	Precision	Recall	F1
BERT	88.83%	92.11%	90.44%
GPT-4	88.76%	84.49%	86.58%

True Positives | False Positives | False Negatives

District/regions – Chapel Allerton, Holbeck, Horsforth, Mabgate, New Briggate, Oakwood, Tinshill, South Leeds, West Leeds

Streets/Roads– Vicar Lane, Water Lane, North Street, Mill Hill, Briggate

POIs– Gledhow Valley, Wens, Garforth Academy, Amity Brewery

horsforth school, Rude Studios, leeds city centre, leeds uni

East, lockdown, chapel, town, campus, tesco, esso garage, debenhams

SRE Extraction

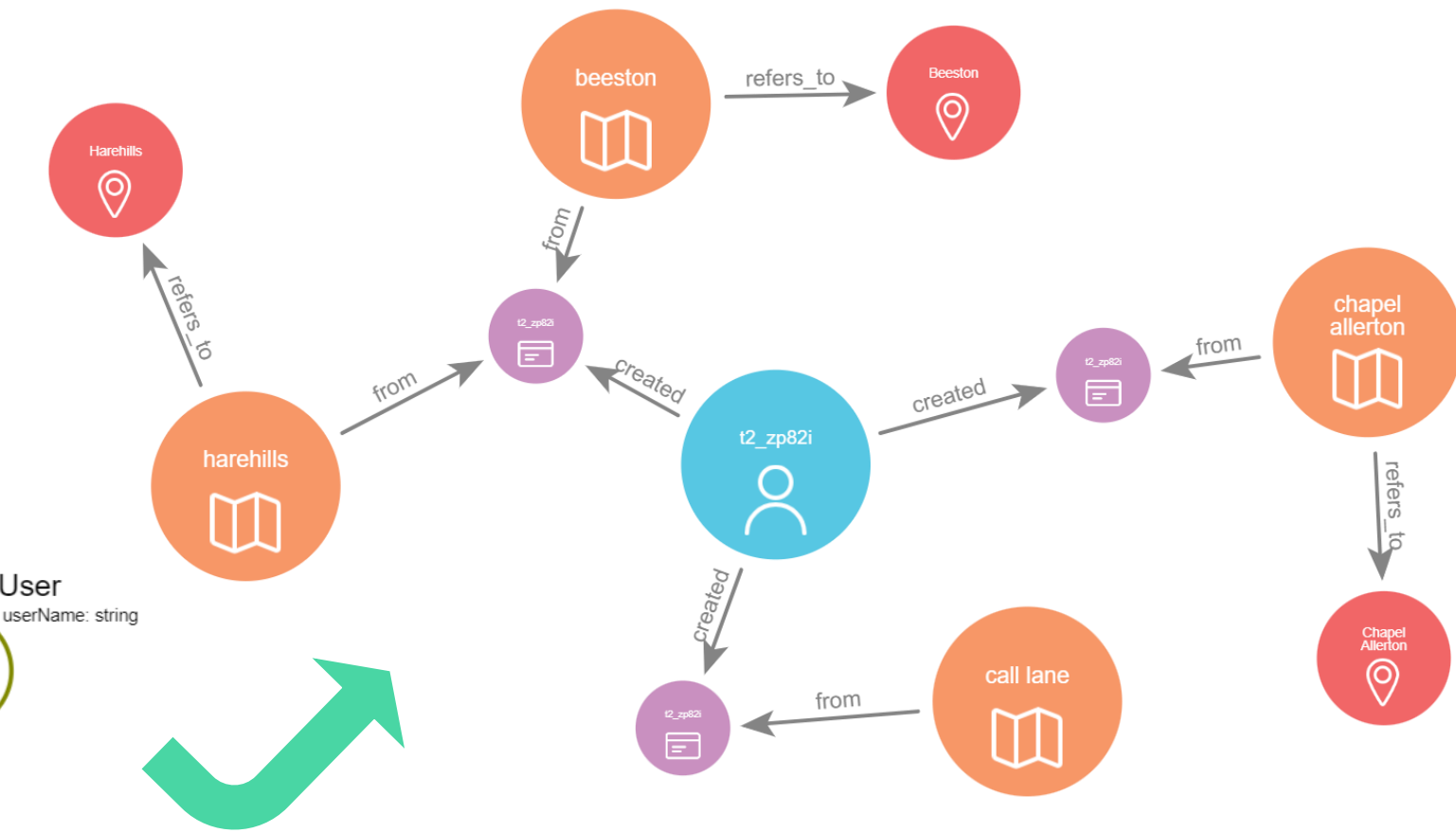
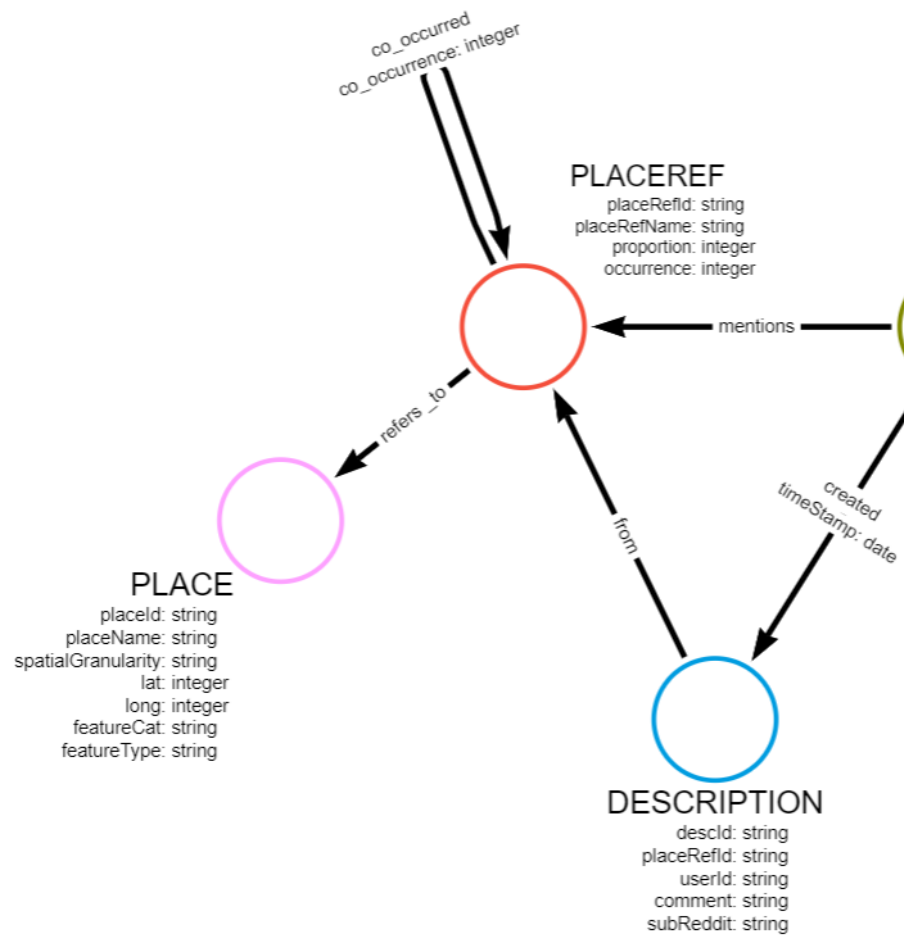
Model	Precision	Recall	F1
GPT-4	88.76%	84.49%	86.58%

“Ok everyone is recommending Tong Garden Center, and sure it is worth a visit, but their plants are expensive. They are not a cheap place to shop. You go as much for the experience of the garden Center and for the product. I rave about Swincar nurseries near Guiseley.”

“Yes! Down between the Clayton Hotel and Bridgewater? I used to work at the Mint off Sweet Street, and the Grove was our Friday night fall out... And Thursday night.... Oh and Wednesday night... Dammit, Monday and Tuesday too alright!”

Subject | Relation | Object

Preliminary Model



Nodes	Amount
PLACE	326
PLACEREF	857
USER	5053
DESCRIPTION	13,990
Total	20,226

Relationships	Amount
PLACEREF – from – DESCRIPTION	18,175
USER – created – DESCRIPTION	13,995
USER – mentions – PLACEREF	13,310
PLACEREF – refersTo – PLACE	110
PLACEREF – co-occurred – PLACEREF	34,016
Total	79,606

Research Project Outcomes

Place Reputation

- Implications with health and wellbeing of populations, also belonging, identity and sense of place
- Hierarchical nature of place reputation within urban environments – ‘most liveable places’

‘Platial-Knowledge Graph’

- Attempt to formalise platial entities from informal & vernacular geographies
- Integration with existing GeoKGs



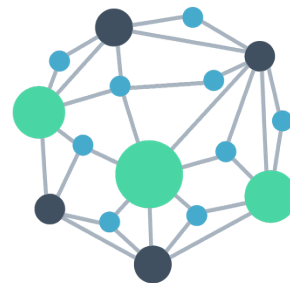
GeoKGs \leftrightarrow GeoAI

GeoKGs supports GeoAI

- Semantic integration of heterogeneous data into GeoAI systems – important for noisy data sources like SM
- Improves decision-making process = transparent + explainable

GeoAI supports GeoKGs

- Construction of KGs
- Analysis – Infer new relationships and patterns
- Query and reason over structured data



Thank you!

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