

## Experiential Hierarchical Datasets for Granular Route Directions

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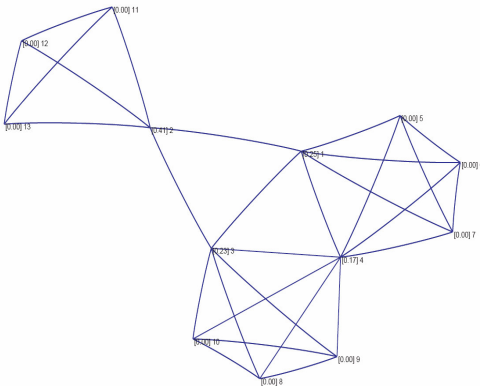
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**Problem:** Extraction of experiential hierarchies in the urban street network for the generation of route directions with varying granularity.

- **Administrative hierarchies** are incoherent with human experience of the hierarchical structure of the environment.
- **Granular route directions** use hierarchical urban models to select appropriate elements of the city to provide directions to familiar wayfinders. References are made to prominent – well known – elements of the network.
- Grounded in the relevance-based communication theory, granular route directions require the **assessment of the shared knowledge** of a spatial entity in a given context.
- Experiential hierarchies reflect the likelihood of shared knowledge of those elements.

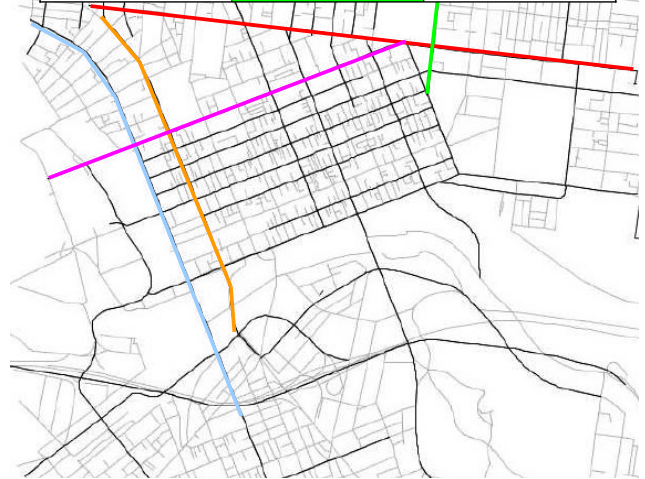
**Hypothesis:** The streets in the street network can be ranked by their prominence, quantified through measures of network connectivity reflecting the likelihood of shared experience among locals.

### Method: Network analysis based on named paths



### Result: Experiential hierarchy of streets

Rank	Street name	Betweenness value
1	Victoria St.	0.3117
2	King St.	0.161
3	Spencer St.	0.141
4	Latrobe St.	0.1277
5	Nicholson St.	0.1022



**Analysis of Melbourne's street network. Named paths of high prominence are highlighted.**

**Streets** are concatenations of street segments with the same *label* – street name. They are recognisable parts of the street network which can be referred to in route directions.

**Structural** properties of a street in the street network may not be related to its administrative classification.

**Network analysis** based on streets allows the quantification of structural properties for each individual street, and cohesive groups of streets (see figure above).

**Experiential hierarchies** of streets reflect their ranking by structural prominence in the urban structure, as experienced by frequent wayfinders.

**Betweenness centrality** was chosen as the measure best reflecting this ranking, free of distortions from individuals' wayfinding behaviour.

### Future work: Integrated hierarchical datasets

Experiential hierarchies of **suburbs** and **landmarks** complement that of the street network. **Integrated hierarchies** of the urban structure allow for a transition between references of different types and are consistent with navigators' experience.