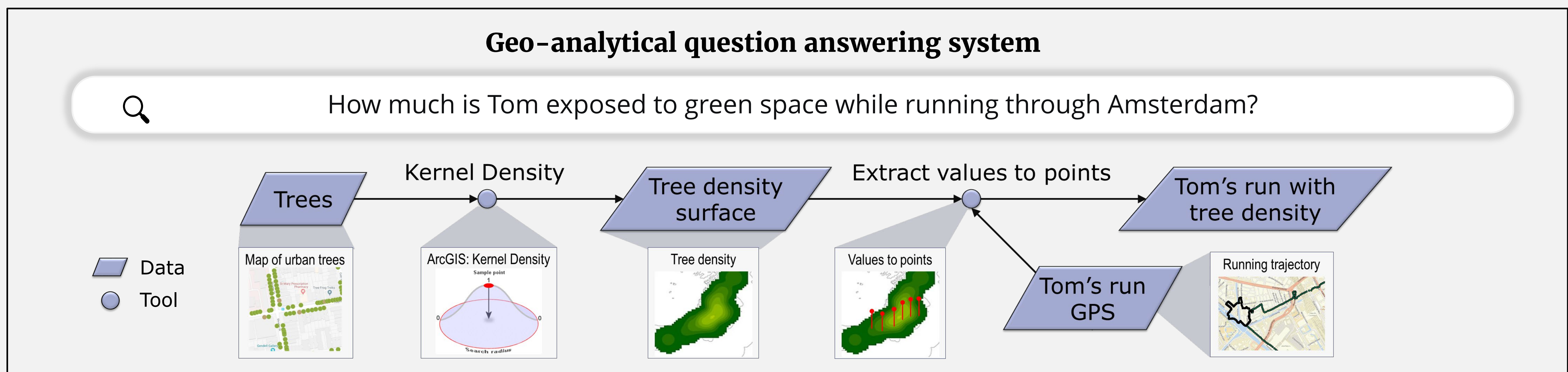


# Question-based Analysis of Geographic Information with Semantic Queries (QuAnGIS)

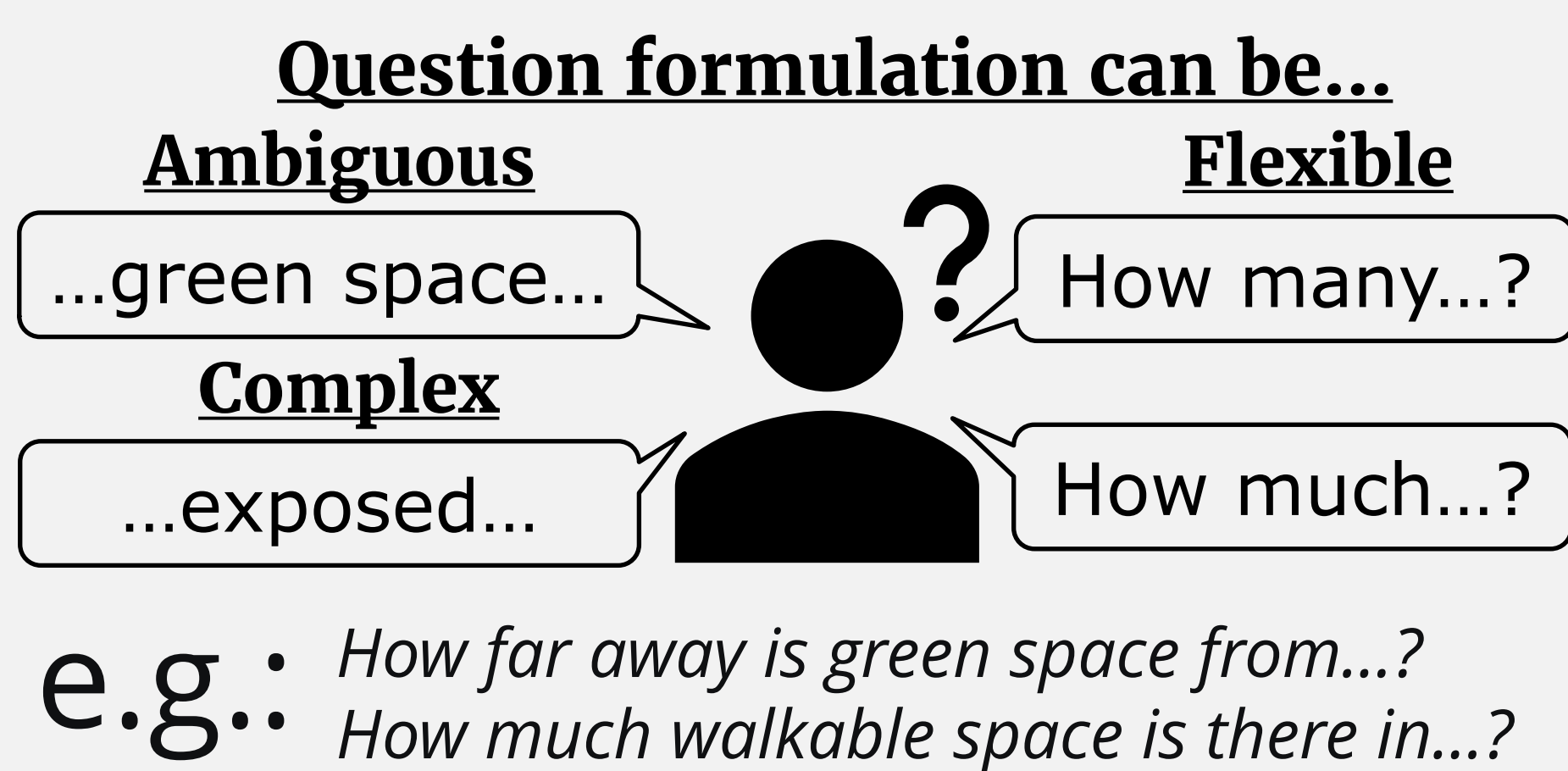
Haiqi Xu, Eric Top, Niels Steenbergen, Enkhbold Nyamsuren, and Simon Scheider  
Department of Human Geography and Spatial Planning, Utrecht University, Utrecht, The Netherlands

## Motivation

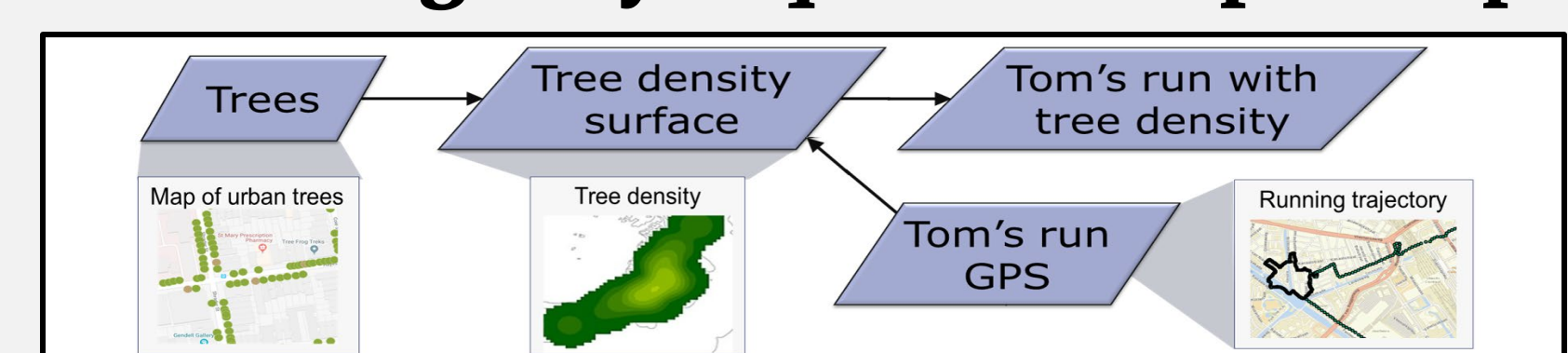


*How to ask and answer geo-analytical questions in a question answering(QA) system with GIS for Human Geography?*

## Challenges



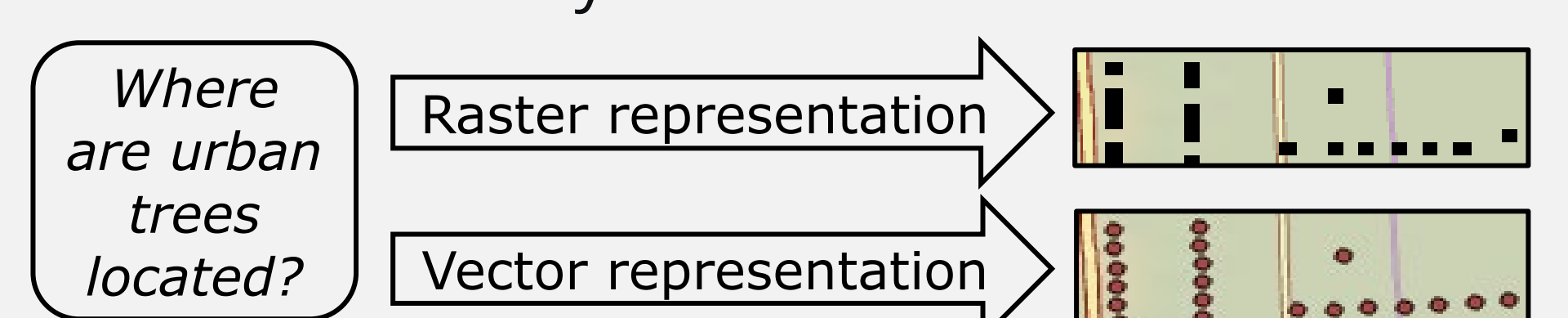
### Answering may require multiple steps



How many urban trees are in Amsterdam? is answered online, but How many trees are there near Tom? is not. That means for the second question **the answer has to be generated!**

### Many possible ways to generate answers

A single question can be answered using **different yet equally valid** tools and geodata [1]. When is an answer valid for a question? How should the system select the 'best' answer?

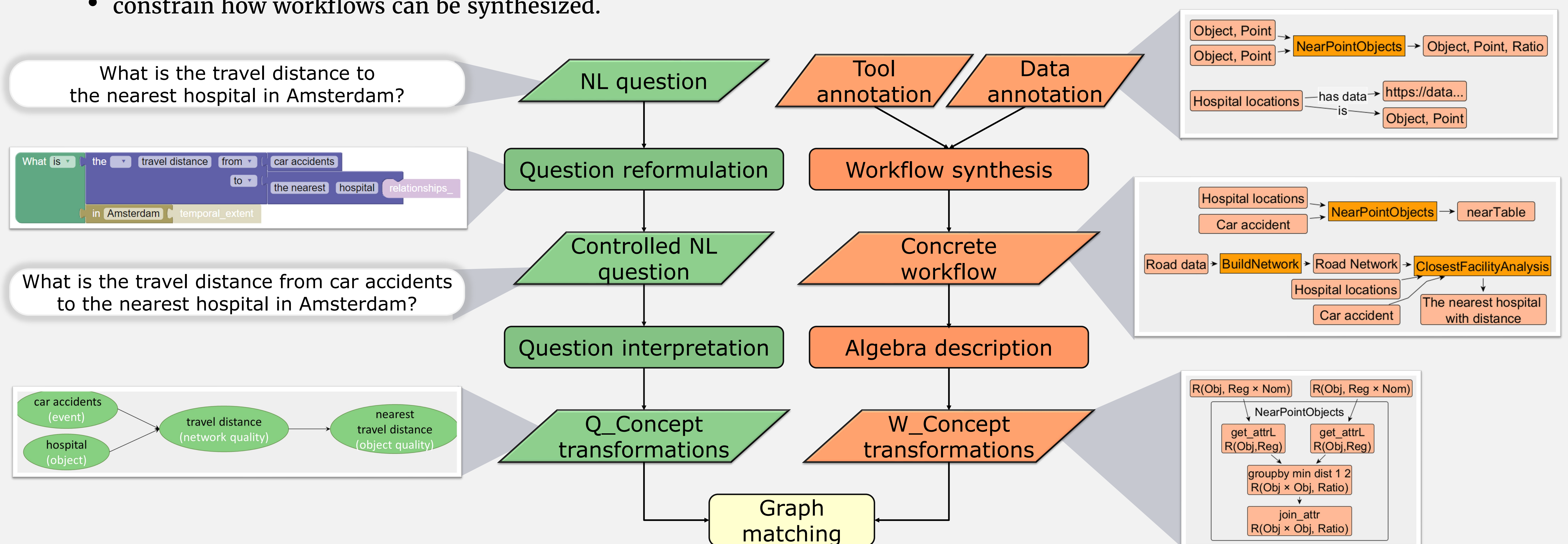


## Solution

**Core concepts of spatial information** [2] includes 10 concepts that distinguish the nature of spatial phenomenon, properties and relations. For example, *field* represents spatially continuous phenomena (e.g., temperature); *object* describes spatially bounded entities (e.g., hospital), *network* refers to quantified relations between objects (e.g., road network).

Core concepts play an important role in defining the solution of geo-analytical QA system, because they can:

- decompose and interpret geo-analytical questions into concept transformations.
- describe the analytical potentials of geodata and clarify how they can be analyzed.
- constrain how workflows can be synthesized.

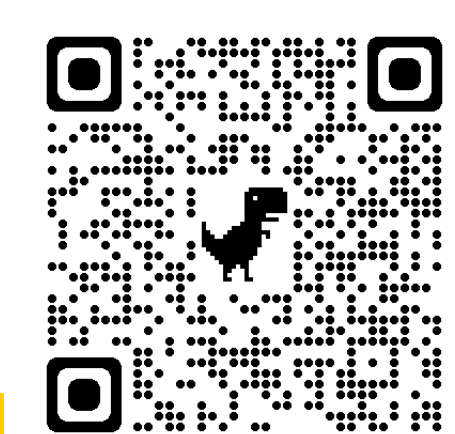


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- Kuhn, W. (2012). Core concepts of spatial information for transdisciplinary research. International Journal of Geographical Information Science, 26(12), 2267-2276.

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