A Quantum Model for Interactive Search based on Information Foraging Theory

Amit Kumar Jaiswal

University of Bedfordshire

Ph.d. Student / Marie Curie Researcher

QUARTZ

Quantum Information Access and Retrieval Theory

Motivation

Modeling user interaction mechanism in image search based on Ingwersen's Cognitive framework:

- Keyword based queries are short/ambiguous/broad and lack cognitive aspects [1] of user, whereas queries in image search explicits the user and tend to be even shorter [2]
- Image search tends to be more exploratory which is not always true in text search
- Image search is heavily relied on user interaction
- User's having under-specified IN [3] face difficult to textually describe what it is they are seeking
- User interaction with SERPs (in images) contain rich implicit user feedback
- Encode contextual explanations by enriching relevant knowledge

1. Moshfeghi, Y., & Jose, J. M. (2013, May). On cognition, emotion, and interaction aspects of search tasks with different search intentions. In *Proceedings of the 22nd international conference on World Wide Web* (pp. 931-942). ACM..
2. Goodrum, A., & Spink, A. (1999). Visual information seeking: A study of image queries on the World Wide Web. In *Proceedings of the ASIST Annual Meeting* (Vol. 36, pp. 665-74).
3. O'Day, V. L., & Jeffries, R. (1993, May). Orienteering in an information landscape: how information seekers get from here to there. In *Proceedings of the INTERACT'93 and CHI'93 conference on Human factors in computing systems* (pp. 438-445). ACM.
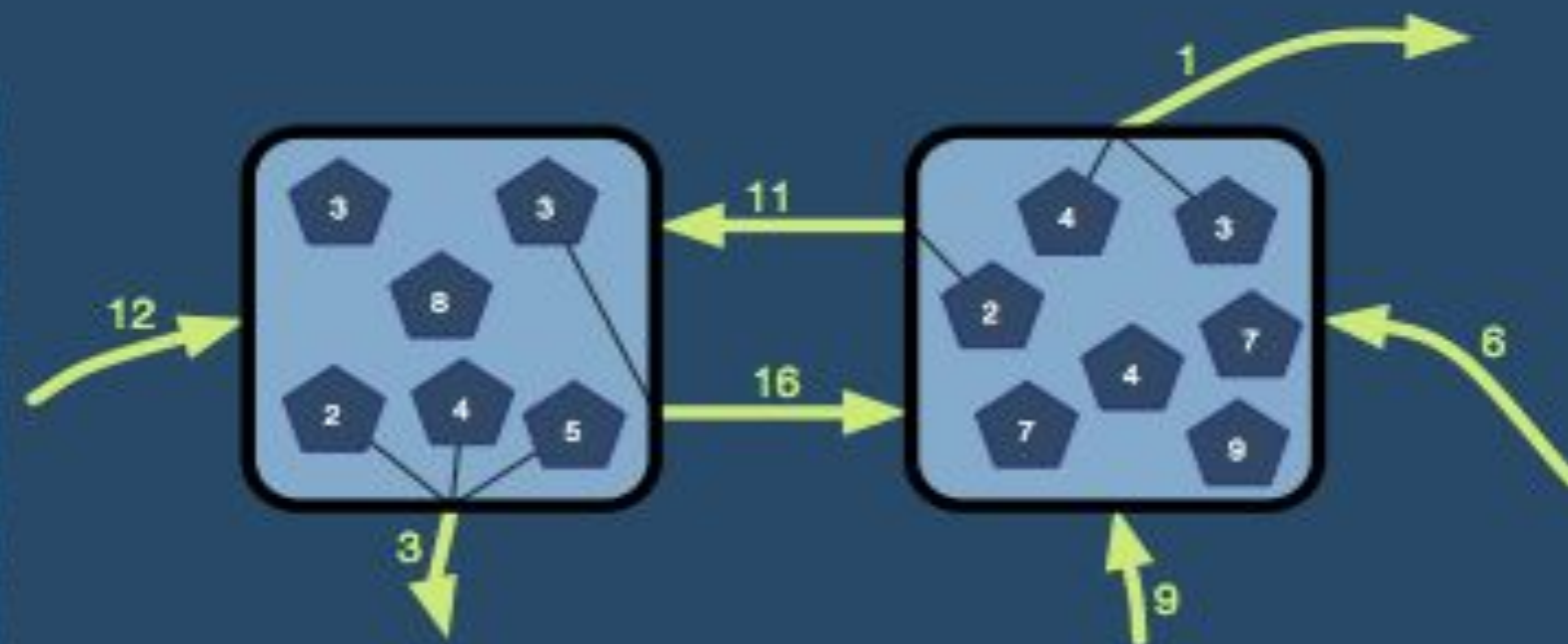
Information Foraging Theory (IFT) for Information Seeking (IS) Behavior

Focussing on IS behavior (Idea inspired by Norbert's Work):

- Model user's actions, interaction (or dynamics) and tactics for satisfying an information need
- Model user cognitive aspects and actions transformation
- Incorporate user cognitive space using Polyrepresentation model [4,5]
- Monitors seeking process (or search process) to infer positive information need
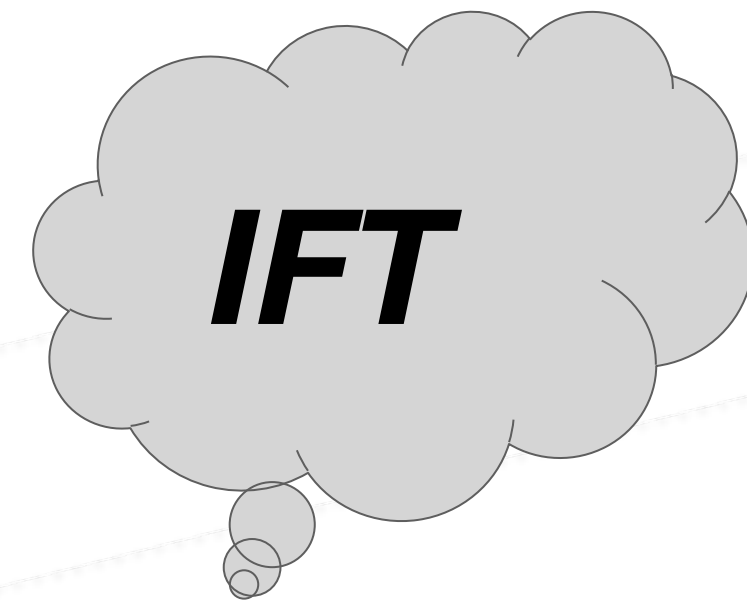
An **information forager** seeks information within a **topology** of **information patches**.

Information features are inside patches, and have a **value**. **Links** connect patches, and they have a **cost**. **Cues** suggest what is gained by following a link.
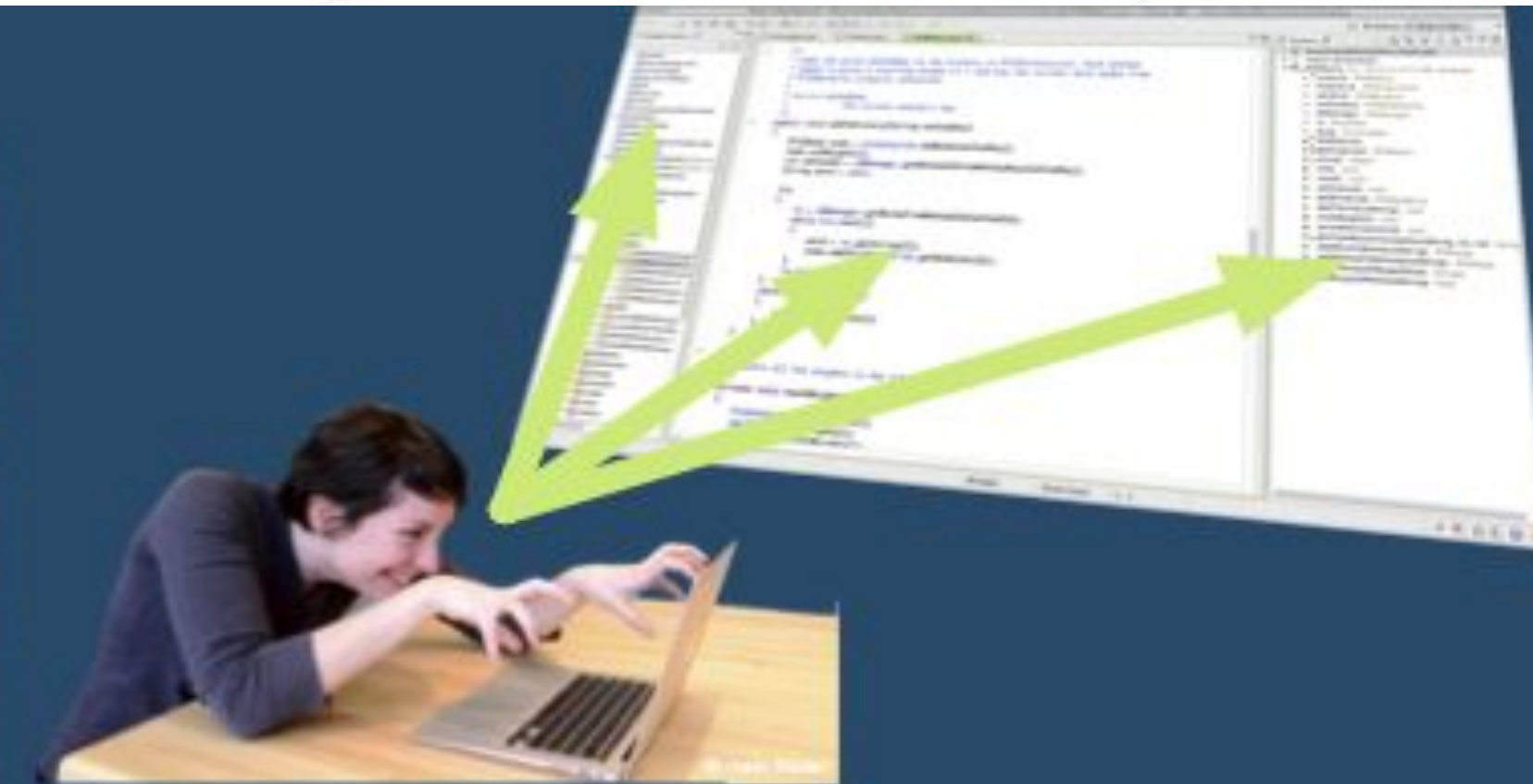
Information foraging theory can predict where a forager is **likely to navigate to**!

4. Ingwersen, P. (1994). Polyrepresentation of information needs and semantic entities elements of a cognitive theory for information retrieval interaction. In *SIGIR'94* (pp. 101-110). Springer, London.
5. Frommholz, I., Larsen, B., Piwowarski, B., Lalmas, M., Ingwersen, P., & Van Rijsbergen, K. (2010, August). Supporting polyrepresentation in a quantum-inspired geometrical retrieval framework. In *Proceedings of the third symposium on Information interaction in context* (pp. 115-124). ACM.

Thanks You!