The goal of this research is to review metrics that characterize user navigation strategies in information seeking tasks on websites. The metrics are evaluated on their ability to predict navigation task outcomes.

**Definitions of Metrics**

### Simple Metrics

- **Revisits** = \( 1 - \frac{U}{N} \), where: 
  - \( N \) = # nodes visited; 
  - \( U \) = # unique nodes visited;

### Graph-Based Metrics

- **Stratum** = a measure of linearity (Botafogo et al. 1992)
- **Compactness** = a measure of connectedness

**Navigation Path Similarity Metrics**

- Denote similarity between user path and the optimal path: 
  - \( S_{u,v} \)
  - \( S_{v,u} \)
  - \( S_{v,v} \)


**Subjective Evaluation of Lostness**

In the TA Study, participants were asked to talk aloud while engaged in the search task—they were asked to report on how well they felt they were doing. Later, a trained human rater watched an audio-video record of the usability session and assessed how lost the participant appeared to be, every 30 seconds. Lostness was rated on a scale: 1—“Definitely Not Lost”, 2—“Probably Not Lost”, 3—“Probably Lost”, 4—“Definitely Lost”.

**Two Experiments**

- **TL Study** — time limit on each information finding task; 
- **TA Study** — users were asked to talk aloud while navigating website.

**Task** — question-driven information seeking on complex websites. Find one web page containing information specified in each question.

**Task constraints** — Navigate to the page, do not use search.

**Participants**:
- **TL**: 48 adults (29M+19F); 
- **TA**: 14 adults (8M+6F).

**Sample question** — “Find passport offices in Ontario.”

**Key Findings**

- Similarity to optimal path was a good predictor of task success and lostness.
- Higher values of stratum (typically along with lower values of compactness) were associated with a higher probability of task success.
- Best predictors of information finding success were different depending on the specific question.
- Association between stratum and task success was opposite to found in previous research (McEneaney, 2001).

**Summary and Future Work**

Appropriate metrics provide useful characterizations of user web navigation behaviour and can help to diagnose a variety of problems. This diagnostic capability could be used to build adaptive web solutions.

Extensions of this research will study:

- Different information finding tasks (e.g., broad browsing).
- Factors that encourage deviation from the optimal or intended path.
- Automatic detection of lostness and provision of an adaptive interface.
- Individual differences such as level of web familiarity, domain knowledge, gender, verbal ability, etc.

The ultimate goal is to inform web design and to improve the information architecture and design of large, complex websites and hypertext documents.