Understanding and Predicting Personal Navigation

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General v. Personal Navigation

Search engines are often used to navigate to

Personal Navigation Prediction Algorithm

Given a query q_i issued by a user Select the two most recent queries $(q_{i-1} \text{ and } q_{i-2})$ from the user's history such that:

particular information resources.

When we identify navigational behavior because everyone uses the same query to navigate to the same page, we call the behavior *general navigation*.

When we identify navigational behavior based on an individual's own search history, we call it personal navigation.

- $q_{i-1} = q_i$ and $q_{i-2} = q_i$
- | urls clicked (q_{i-1}) | > 0
- | urls clicked (q_{i-2}) | > 0

Predict the user will click $u \in \{urls clicked(q_{i-1})\}$ iff:

- $q_{i_{-1}} \neq$ null and $q_{i_{-2}} \neq$ null
- | urls clicked (q_{i-1}) U urls clicked (q_{i-2}) | = 1

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RELATED SEARCHES Jaime Teevan John Teevan Brooks Teevan Teevan Restoration Teevan Amazon Teevan Bing Tom Mingle	ALL RESULTS 1-10 of 53,800 results · Advanced Teevan For almost forty years, we have been known to many as the premier painting and waterproofing company in San Francisco. In addition, for over two decades, we have brought the same www.teevan.com · Cached page Teevan - Wookieepedia, the Star Wars Wiki Teevan can refer to: This is a disambiguation page—a navigational aid that lists other pages that might otherwise share the same title. starwars.wikia.com/wiki/Teevan · Cached page Teevan [History of Teevan] Jim Teevan founded Teevan Painting in 1963 after graduating from Burlingame High School. In 1967 Jim graduated from Yale University and in 1969, received www.teevan.com/history.html · Cached page Jaime Teevan, Ph.D.	

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interaction at Microsoft Research.

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	second search				



...third search!

Personal Navigation

_		Few people	Many people
	Different	biggest spider	american idol
		cooking videos	flash games
		firewood	hidden object games
		tiny house plans	horoscopes
		url shortener	justin bieber
		wholesale clothes	tiger woods
	for all	azflyfishing	drudge report
		great bay volleyball	eharmony login
		media gossip	msn games
	ne	new moon bar	myyearbook
	San	stanford lane library	pandora
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Understanding Personal Navigation

Properties of general navigation searches:

- There are very few general navigation queries
- But each individual query is very popular
- Queries are short and contain URL fragments -
- Target result usually ranked first -
- Everyone uses the query the same way -

Properties of personal navigation searches:

- There are a lot of personal navigation queries
- But individual queries tend to be unusual -
- Queries are longer and do not contain URLs -
- Target result often ranked lower Other people use the query differently -

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photobucket

Predicting Personal Navigational

It is possible to predict personal navigation:

- High accuracy (right 95% of the time)
- High coverage (predict for 15% of all queries)

Properties of the personal navigation predictions:

- Coverage still high when general navigation is excluded (predict for 10% of all queries)
- Longer aggregation periods improve coverage -
- Group behavior can increase coverage further
- Predictions are stable over time, making offline prediction possible



Using additional user history can improve the accuracy of the personal navigation prediction, but it also reduces the coverage.