

Addressing the “Uncanny Valley” of Search UX - Anticipatory Design, Privacy, and Tolerance for Systems that Speculate About You

Jason A. Clark
Associate Professor
Head, Library Informatics & Computing
Montana State University (MSU) Library

Krista Godfrey
Interim Head, Library IT Services/
Web Services Librarian
Memorial University

Access 2016
New Brunswick, Canada
October 6, 2015

twitter as channel (#hashtag)

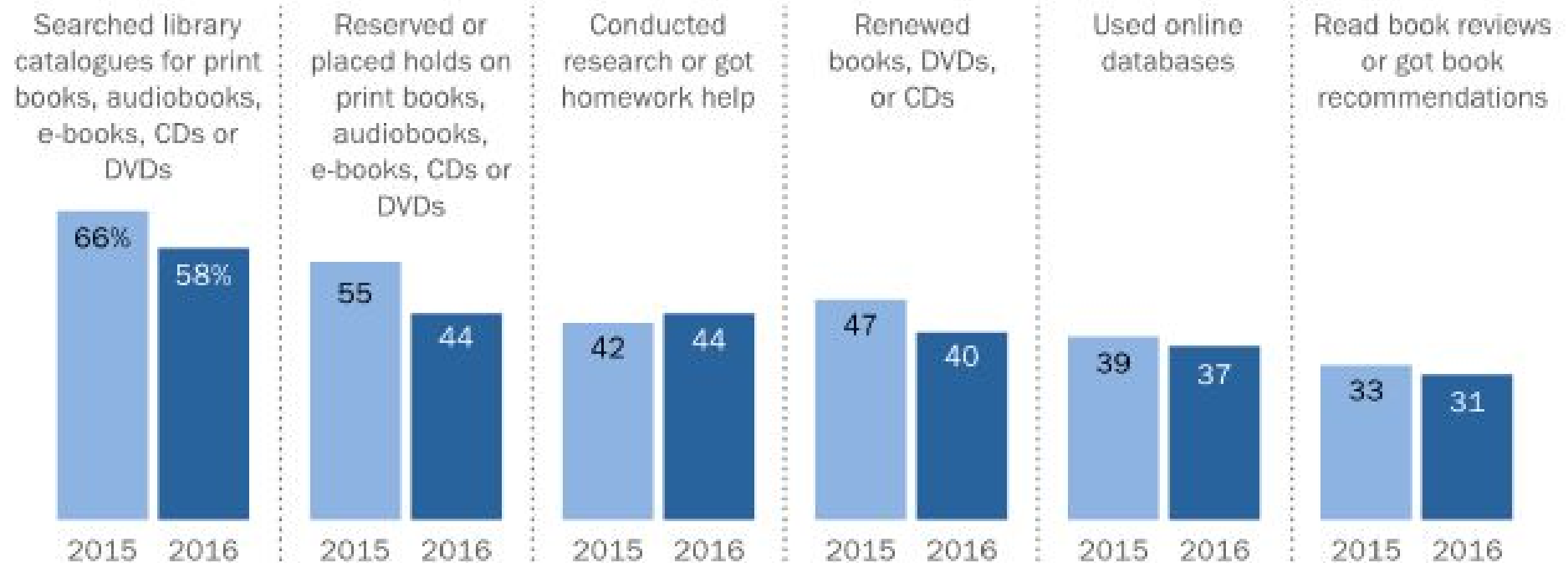
@jaclark
@weelibrarian
#access2016

Overview

- Applying context and intention to Search UX
- Anticipatory Design in a search prototype
- Privacy and the Uncanny Valley
- User Testing
- Questions

For Americans using libraries digital tools, searching library catalogues for content is the most prevalent activity

% of U.S. library website users ages 16 and older who have done the following on library websites in the past 12 months



Note: 28% of those ages 16 and older who used library websites or mobile apps in the past 12 months.

Source: Survey conducted March 7-April 4, 2016.

"Libraries 2016"

PEW RESEARCH CENTER

In "Libraries Usage and Engagement", Libraries 2016 - Pew Research Center
<http://www.pewinternet.org/2016/09/09/library-usage-and-engagement/>

Full report: http://www.pewinternet.org/files/2016/09/PI_2016.09.09_Libraries-2016_FINAL.pdf

Most prevalent activity = Searching library catalogues

In "Libraries Usage and Engagement", Libraries 2016 - Pew Research Center
<http://www.pewinternet.org/2016/09/09/library-usage-and-engagement/>

Full report: http://www.pewinternet.org/files/2016/09/PI_2016.09.09_Libraries-2016_FINAL.pdf



CatSearch for articles, journals, books and more



[Advanced Search](#)

FIND

Find research materials, including articles, books, databases, journals, and course reserves

REQUEST

Request resources and services, including group study rooms, laptops, documents, and books

SERVICES

Meet with us for research assistance, writing help, and tech support

[New Search](#) | [Journals by Title](#) | [What is CatSearch?](#) | [Help](#)
[Guest](#) [★ e-Shelf](#) [Sign in](#)
[Quick Search](#)
[Books+](#)
[Articles+](#)

laser

Montana State University Library


[Search](#)
[Advanced Search](#)
[Browse Search](#)

Personalize your results


[Edit](#)

Show only

[Peer-reviewed
Journals](#) (528,158)

[Full Text
Online](#) (687,544)

[Resource Type](#) +

[Subject](#) +

[Author](#) +

[Date](#) +

**Results 1 - 10 of 847,727 for
Montana State University Library**

Sorted by: [Relevance](#)
[1](#) [2](#) [3](#) [4](#) [5](#) [→](#)

Show only [Peer-reviewed Journals](#) (528,158) | [Full Text Online](#) (687,544)

1



Article



Laser

Chaine, G. ; Perol, J. ; Champion, E.
EMC - AKOS - Trattato di Medicina, 2014, Vol.16(3), pp.1-4
refrattiva utilizza i **laser** a femtosecondi per il... sviluppata
notevolmente grazie al **laser** ad argon. L... Storicamente, si tratta della
prima applicazione dei

[● Select MSU Availability](#)
[MSU Availability](#) [Details](#)

2



Book



The **Laser** Biophysics Center.

Laser Biophysics Center (U.S.) 1989?
[● Check holdings at MSU Bozeman Documents](#) (D 1.2:L 33)

[Details](#) [Locations](#)

3


Reference
Entry


Laser

2013
The Columbia Encyclopedia
-Dubois, **Laser** Handbook (1973). J. Walker Light and... **laser** differs
from ordinary light in that it is made up... beam of coherent light. The
laser is

[● Select MSU Availability](#)

Speech Act => Context +
Intention

John Searle, Speech Acts: An Essay in the Philosophy of Language (1969)
https://en.wikipedia.org/wiki/Speech_act





#libeyrianship

Interpretation

Search Act \Rightarrow Context + Intention

search query =
literal aspect + inferred aspect

“yellowstone national park”
[search query]

“yellowstone national park”
[literal aspect]

iPhone user, on MT highway
[tacit, inferred aspect]

Cues from the “live” Query

Word Counts
Punctuation
Natural Language Questions


```
$cueWords = array( "about", "above", "across", "after", "afterwards", "again",  
"against", "all", "almost", "alone", "became", "because", "become", "becomes",  
"becoming", "been", "before", "beforehand", "behind", "being", "below",  
"beside", "besides", "between", "beyond", "by", "call", "can", "cannot",  
"cant", "could", "couldnt", "cry", "describe", "do", "either", "except", "few",  
"fill", "find", "found", "from", "front", "full", "further", "get", "give",  
"go", "had", "has", "hasnt", "have", "how", "however", "hundred", "if", "in",  
"indeed", "interest", "into", "is", "keep", "might", "mine", "more",  
"moreover", "most", "mostly", "move", "much", "must", "my", "myself", "name",  
"never", "nevertheless", "nor", "not", "nothing", "now", "nowhere", "of",  
"off", "often", "on", "once", "one", "only", "onto", "or", "other", "others",  
"otherwise", "our", "ours", "ourselves", "out", "over", "own", "part", "per",  
"perhaps", "please", "put", "rather", "see", "seem", "seemed", "seeming",  
"seems", "should", "show", "side", "since", "so", "some", "somehow", "someone",  
"something", "sometime", "sometimes", "somewhere", "still", "such", "system",  
"take", "temp", "temperature", "than", "that", "the", "their", "them",  
"themselves", "then", "thence", "there", "thereafter", "thereby", "therefore",  
"therein", "thereupon", "these", "they", "this", "those", "though", "three",  
"through", "throughout", "thru", "thus", "to", "together", "too", "top",  
"toward", "towards", "under", "until", "up", "upon", "us", "very", "time",  
"were", "weather", "what", "whatever", "when", "whence", "whenever", "where",  
"whereafter", "whereas", "whereby", "wherein", "whereupon", "wherever",  
"whether", "which", "while", "whither", "who", "whoever", "whole", "whom",  
"whose", "why", "will", "with", "within", "without", "would", "yet", "you",  
"your", "yours", "yourself", "yourselves");
```

```
cueWords = ["about", "above", ... , "can", ...]  
query = 'Can I get research help?';  
if (in_array(strtolower($query), $cueWords)) {  
    echo "Here are some people to talk to: ";  
}
```

OR

```
# python example  
cueWords = ["about", "above", ... , "can", ...]  
query = 'Can I get research help?'  
query.lower()  
if query in cueWords:  
    print Here are some people to talk to:
```

Cues from the Machine

HTTP Headers + Global Server Variables

en.wikipedia.org/wiki/List_of_HTTP_header_fields

Host: www.lib.montana.edu

Connection: keep-alive

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8

User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_7_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/38.0.2125.122 Safari/537.36

Referer: http://www.lib.montana.edu/~jason/files.php

Accept-Encoding: gzip,deflate,sdch

Accept-Language: en-US,en;q=0.8

Cookie: is_returning=1; optimizelyEndUserId=oeu1413387638672r0.9280797478277236; optimizelySegments=%7B%22204658328%22%3A%22false%22%2C%22204728159%22%3A%22none%22%2C%22204736122%22%3A%22%22%7D; optimizelyBuckets=%7B%7D; s_fid=1162C3214F4A86F8-1B28DA485FC96756; s_lv=1413387991698; __atuvc=0%7C39%2C0%7C40%2C0%7C41%2C0%7C42%2C1%7C43; is_returning=1; __utma=55097015.1071264323.1398267937.1415934660.1415983050.7; __utmz=55097015.1415983050.7.7.utmcsr=google|utmccn=(organic)|utmcmd=organic|utmctr=(not%20provided); __ga=GA1.2.1071264323.1398267937; __utmt=1; __utma=112212121.694734941.1395729614.1416383505.1416454676.267; __utmb=112212121.2.10.1416454676; __utmc=112212121; __utmz=112212121.1416383505.266.57.utmcsr=google|utmccn=(organic)|utmcmd=organic|utmctr=(not%20provided)

Page URL: http://www.lib.montana.edu/~jason/files/digital-collections-custom-search-api/index.php

Referring URL: http://www.lib.montana.edu/~jason/files.php

IP Address: 153.90.170.5

Timestamp: Wednesday, November 19, 2014 8:38 pm

Location from the Browser or
Network Info

```
1  {
2    "longitude": -110.9013,
3    "latitude": 45.628,
4    "asn": "AS13476",
5    "offset": "-6",
6    "ip": "153.90.170.5",
7    "area_code": "0",
8    "continent_code": "NA",
9    "dma_code": "0",
10   "city": "Bozeman",
11   "timezone": "America/Denver",
12   "region": "Montana",
13   "country_code": "US",
14   "isp": "Montana State University",
15   "postal_code": "59717",
16   "country": "United States",
17   "country_code3": "USA",
18   "region_code": "MT"
19 }
```


Figure: Screenshot of JSONLint view of values returned from Telize API

Javascript Variables from the Browser Load

Am I Unique?

 Home

 My fingerprint

 My timeline

 Global statistics

 FAQ



 Privacy policy

 Privacy tools

 Links

 About

 View on GitHub

We reached **100,000 fingerprints!** We never thought we would reach such a high number!
Thanks to all visitors for supporting our research!
We also launched an AmlUnique extension for  [Firefox](#) and  [Chrome](#). More details can be found [HERE](#).

Learn how identifiable you are on the Internet
Help us investigate the diversity of web browsers

[View my browser fingerprint](#)

By clicking on this button, only anonymous data will be collected and a cookie will be stored in your browser for four months. You can find more details in the [Privacy Policy](#).

Spread the word! Share AmlUnique!
Try it on all your devices!



<https://amiunique.org/>

Javascript functions:

```
window.navigator.plugins  
window.navigator.platform  
window.navigator.cookieEnabled  
window.navigator.doNotTrack  
new Date().getTimezoneOffset()  
window.screen.height  
window.screen.width  
window.screen.colorDepth
```

Cues from Analytics Logs

deer,
divergent,
indian,
avalanche,
dissertations,
cinnabar,
Election+1845,
Hudson%2C+B.,
montana+hospital+records+1927-1933,
yearbook,
JFK+assassination,
William+Lester+Stockton,
bison,
sounds+of+yellowstone,
dissertation,
Search+our+digital+collections...,
Search+our+digital+collections...,
service+learning,
bozeman+claims+association,
photosynthesis,
Dissertations,
milk+river,
bison+vocalization,
geothermal,
thunder,
swan,
dissertation,
burgess,
Reproductive+biology+of+brown+and+rainbow+trout+below+Hauser+Dam%2C+Missouri+River%2C+with+reference+to+proposed+hydroelectric+peaking,
yearbook,
bison,
leadership+philosophy,
ISSW,
dissertations,
jason+clark,
justin+spinelli,
jason+clark,
Lanny+Real+Bird,
dissertations,

Use these cues to show different
parts of search index and
additional context

This is anticipatory design.

www.smashingmagazine.com/2015/09/anticipatory-design/

“The goal is not to help the user make a decision, but to create **an ecosystem where a decision is never made**—it happens automatically and without user input. The design goal becomes one where we eliminate as many steps as possible and find ways to **use data, prior behaviors, and business logic to have things happen automatically, or as close to automatic as we can get.**”

www.fastcodesign.com/3045039/the-next-big-thing-in-design-fewer-choices
www.smashingmagazine.com/2015/09/anticipatory-design/

Code

<https://github.com/jasonclark/search-ux/>

Technical Stack

Google Custom Search Engine

Javascript

PHP

Python

HTML + CSS

Prototype

<https://www.lib.montana.edu/~jason/files/search-ux/>

Ten Blue Links

Facets

Not seeing what you need? Watch the space below for refinements.

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

[What is this?](#)

[Privacy?](#)

www.lib.montana.edu/~jason/files/search-ux/
github.com/jasonclark/search-ux

Ten Blue Links

sara mannheimer data services

Search

Sort: [Relevance](#) or [Date](#)

"sara mannheimer data services" (About 10 results)

[Sara Mannheimer - Data Management Librarian \[Assistant Professor ...](#)

www.lib.montana.edu/people/about/139

[Publication and Data Services - MSU Library | Montana State ...](#)

<https://www.lib.montana.edu/services/publication-and-data/>

[Home - Data Management - Library Guides at Montana State ...](#)

guides.lib.montana.edu/data

[Sara Mannheimer - Library Guides at Montana State University](#)

guides.lib.montana.edu/prf.php?account_id=33395

[Faculty & Professional Vitae :: Montana State University Libraries](#)

Facets

Not seeing what you need? Watch the space below for refinements.

- ▶ Categories
- ▶ People
- ▶ FAQ
- ▶ Offers

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

[What is this?](#)
[Privacy?](#)

Small Result Set (< 30 results)

Ten Blue Links

research help

Search

Sort: [Relevance](#) or [Date](#)

"research help" (About 825 results)

[Ask the Library - Ask the Library](#)

ask.lib.montana.edu/

[Research and Instruction Services - MSU Library | Montana State ...](#)

www.lib.montana.edu/services/research-and-instruction/

[Services - MSU Library | Montana State University](#)

<https://www.lib.montana.edu/services/>

[Home - Psychology Research - Library Guides at Montana State ...](#)

guides.lib.montana.edu/psy

[Publication and Data Services - MSU Library | Montana State ...](#)

<https://www.lib.montana.edu/services/publication-and-data/>

Facets

Not seeing what you need? Watch the space below for refinements.

- ▶ Categories
- ▶ "Hand-picked" Topics
- ▶ Topics by Location
- ▶ Popular
- ▶ People
- ▶ FAQ
- ▶ Offers

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

[What is this?](#)

[Privacy?](#)

Large Result Set (> 30 results)

Ten Blue Links

who is susan borda?

Search

Sort: [Relevance](#) or [Date](#)

"who is susan borda?" (About 9 results)

[Susan Borda - Digital Technologies Development Librarian ...](#)

www.lib.montana.edu/people/about/141

[People in the Library - Results :: Montana State University \(MSU ...](#)

[www.lib.montana.edu/people/view.php?](http://www.lib.montana.edu/people/view.php?team=Library...and...)

[team=Library...and...](#)

[Faculty & Professional Vitae :: Montana State University Libraries](#)

www.lib.montana.edu/people/vitae.php

[Liaisons by College/Department - MSU Library | Montana State ...](#)

www.lib.montana.edu/services/liaisons-by-department.html

[Profiles - Library Guides at Montana State University](#)

guides.lib.montana.edu/prf.php

Facets

Not seeing what you need? Watch the space below for refinements.

▼ It looks like you are asking a question.

Do you want to [talk to a librarian?](#)

- ▶ Research Help
- ▶ FAQ
- ▶ Categories
- ▶ Offers

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

[What is this?](#)
[Privacy?](#)

Suggestions Based on Natural Language Question

Ten Blue Links

research help

Search

Sort: [Relevance](#) or [Date](#)

"research help" (About 846 results)

[Ask the Library - Ask the Library](#)

ask.lib.montana.edu/

[Research and Instruction Services - MSU Library | Montana State ...](#)

www.lib.montana.edu/services/research-and-instruction/

[Services - MSU Library | Montana State University](#)

<https://www.lib.montana.edu/services/>

[Home - Psychology Research - Library Guides at Montana State ...](#)

guides.lib.montana.edu/psy

[Publication and Data Services - MSU Library | Montana State ...](#)

<https://www.lib.montana.edu/services/publication-and-data/>

Facets

Not seeing what you need? Watch the space below for refinements.

► Categories

▼ "Hand-picked" Topics

A few common topics based on our [human-created sitemap](#) and an analysis of our search logs.

[articles & research databases, borrow, research help, library hours, yellowstone, parking & directions, montana history, google scholar msu, montana code annotated, mla format 6th edition](#)

► Topics by Location

► Popular

► People

► FAQ

► Offers

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

Suggestions Based on Result Set Size

Ten Blue Links

research help

Search

Sort: [Relevance](#) or [Date](#)

"research help" (About 653 results)

[Ask the Library - Ask the Library](#)

ask.lib.montana.edu/

[Services - MSU Library | Montana State University](#)

www.lib.montana.edu/services/

[Research and Instruction Services - MSU Library | Montana State ...](#)

www.lib.montana.edu/services/research-and-instruction/

[Research & Publication Support - Faculty Services - Library Guides ...](#)

guides.lib.montana.edu/faculty/research

[Library Research Skills Syllabus, Spring 2015 COURSE ...](#)

https://lib.montana.edu/.../montana_state_university_lsci_121_syllabus_spring_2015.pdf

[Home - Agriculture Resources - Library Guides at Montana State ...](#)

guides.lib.montana.edu/agriculture

Facets

Not seeing what you need? Watch the space below for refinements.

- ▶ "Hand-picked" Topics
- ▶ Topics by Location
- ▶ Popular
- ▶ Categories
- ▼ Offers

Offers based on current date and local weather.

It is that time of the year. The days are shorter and research papers are happening. Get started by [talking to a Librarian](#).

It's cloudy and cold, stop in for a cup of something warm. Check out the ["Brewed Awakening" hours and menu](#).

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

[What is this?](#)
[Privacy?](#)

Suggestions Based on Local Context - Time in Academic Calendar

Ten Blue Links

Sort: [Relevance](#) or [Date](#)

"research help" (About 825 results)

[Ask the Library - Ask the Library](#)

ask.lib.montana.edu/

[Research and Instruction Services - MSU Library | Montana State ...](#)

www.lib.montana.edu/services/research-and-instruction/

[Services - MSU Library | Montana State University](#)

<https://www.lib.montana.edu/services/>

[Home - Psychology Research - Library Guides at Montana State ...](#)

guides.lib.montana.edu/psy

[Publication and Data Services - MSU Library | Montana State ...](#)

<https://www.lib.montana.edu/services/publication-and-data/>

Facets

Not seeing what you need? Watch the space below for refinements.

- ▶ Categories
- ▶ "Hand-picked" Topics
- ▶ Topics by Location
- ▶ Popular
- ▶ People
- ▶ FAQ
- ▼ Offers

An offer based on local weather.

It's cloudy and cold, stop in for a cup of something warm.
Check out the ["Brewed Awakening" hours and menu.](#)

With this prototype, I'm looking at ways that the search act can be treated as a conversation.

[What is this?](#)

[Privacy?](#)

Suggestions Based on Local Context - Weather

About - Ten Blue Links

Search Application for "Improving Search UX using Query Analysis and Machine Cues"

Prototype for article and presentation: "Is there a Ghost in the [Search] Machine? Improving Search UX using Query Analysis and Machine Cues". [Slides for context are available.](#)

Creator(s): Jason A. Clark web: [jason clark](#) twitter: [@jaclark](#)

Version: 1.0.0 [[code on GitHub](#)]

Tech: Javascript, PHP, Python, HTML, and CSS

Data Sources:

<https://arc.lib.montana.edu>

<https://arc.lib.montana.edu/digital-collections/search-log.txt>

<https://ask.lib.montana.edu>

<https://guides.lib.montana.edu>

<http://www.lib.montana.edu>

<http://www.lib.montana.edu/sitemap.html>

Tension of personalization and customization

Woman Stalked Across 8 Websites By Obsessed Shoe Advertisement

NEWS IN BRIEF

October 12, 2015

VOL 51 ISSUE 41

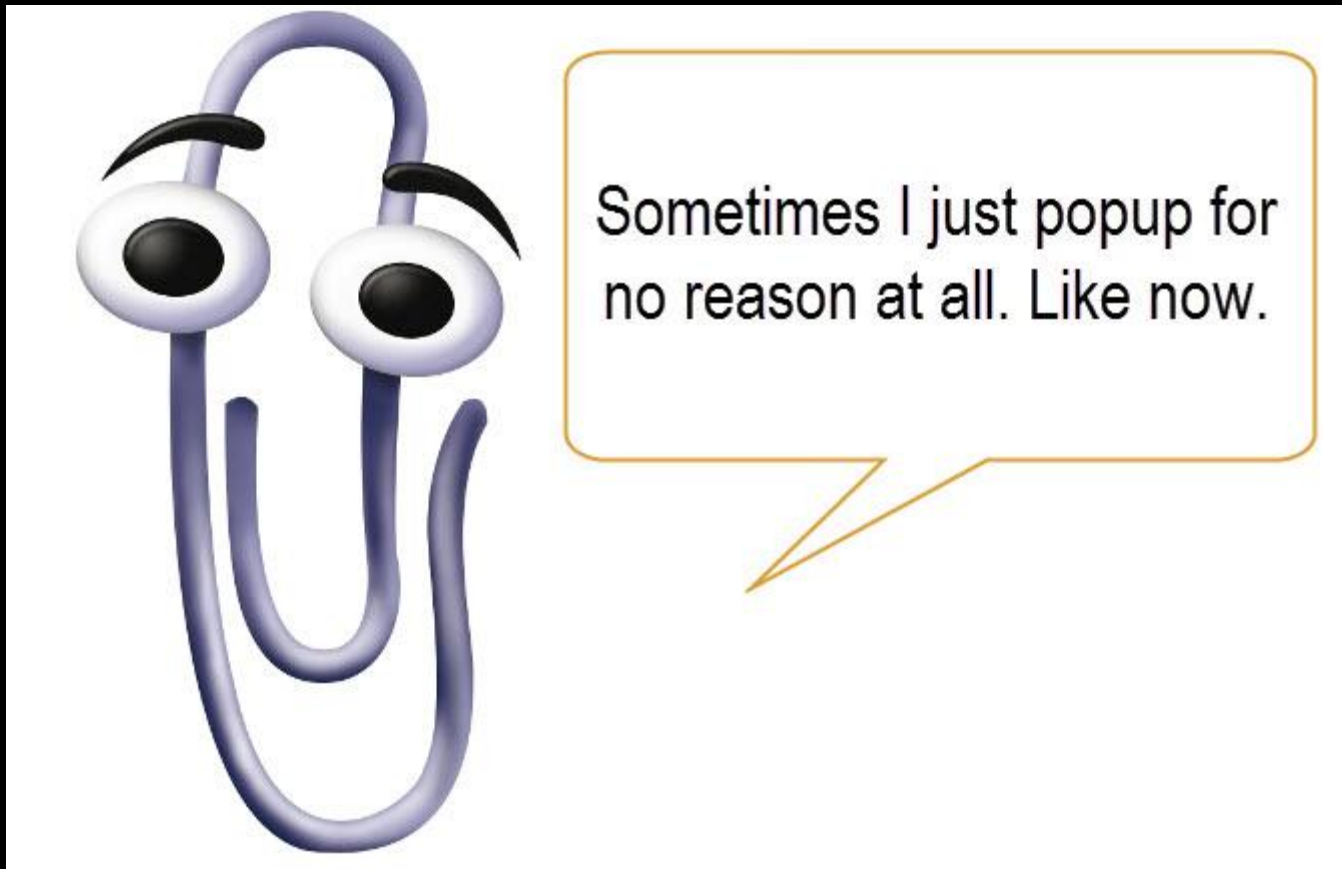
News · Technology ·
Advertising · Fashion



LAWRENCEVILLE, GA—Expressing her growing unease at repeatedly spotting the same picture and text lurking in the corners of her favorite webpages, local woman

The “Uncanny Valley” of the Search Experience

https://en.wikipedia.org/wiki/Uncanny_valley



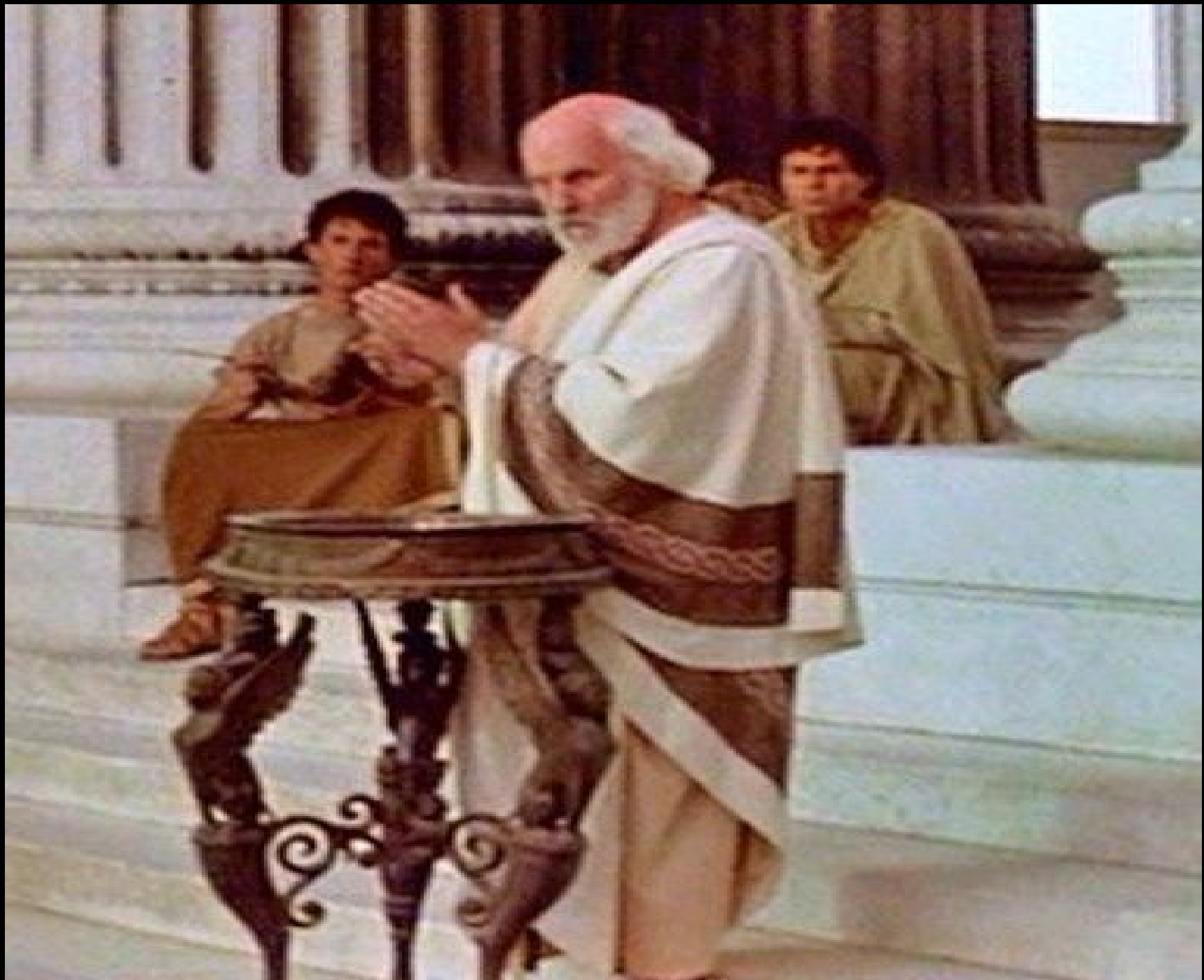
https://en.wikipedia.org/wiki/Office_Assistant



“Optimization for first time use” problem

There are Ghosts in the [Search]
Machine.

What do we as a profession
choose to do with them?



How can we know?

Privacy

Privacy - Ten Blue Links

With this project, I am interested in preserving the privacy of users while allowing for customizations that add value to searching and browsing. In the interest of transparency, I'm listing the sources of the data that allowed for the enhancements and facets for the application

Rudimentary intention analysis and semantic evaluation of the search query string/pattern

Cues from the "machine": HTTP Headers, global server variables, web browser Javascript variables, and location info from the network or browser

Anonymized search log and web analytics data with IP and PII (personally identifiable information) removed

I'm interested in finding the line where utility and adding value with this data cross into notions of surveillance. If you have thoughts or want to learn more, [contact Jason A. Clark](#) or find me on twitter [@jaclark](#).

Links

[Home](#)

[What is this?](#)

Do people care about
privacy?

Pew Research Center (2016)

“It depends.”

<http://www.pewinternet.org/2016/01/14/privacy-and-information-sharing/>

How do you test privacy attitudes?

User Testing

Testing and Scripts

<https://github.com/jasonclark/search-ux/tree/master/meta/docs>

Testing the Tool

Scenario Based Testing

Natural(ish) scenarios the users might face when using the website or tool

Your paper is due in 2 days and you need to get to the library early to get it done. How would you find out when the library opens? How would you make sure the library was near you?

VS

What hours are the library open and where is the library located?

Always test your test!

Privacy baseline

What did we ask?

1. Do you use services such as Google or Facebook?
2. How do you think personalization and customization in Google or Facebook happen?
3. Do you like that Facebook uses your information to improve your experience (ads, suggested pages or people, etc)?
4. Are you willing to allow for some of your personal information to be shared to allow for custom library services?
 - a. What kind of information are you comfortable sharing to this end?
 - i. Personal demographics?
 - ii. Your Location?
 - iii. Previous searches?

Results???

Privacy and Information Sharing

Many Americans say they might provide personal information, depending on the deal being offered and how much risk they face

BY LEE RAINIE AND MAEVE DUGGAN

Most Americans see privacy issues in commercial settings as contingent and context-dependent. A new Pew Research Center study based on a survey of 461 U.S. adults and nine online focus groups of 80 people finds that there are a variety of circumstances under which many Americans would share personal information or permit surveillance in return for getting something of perceived value. For instance, a majority of Americans think it would be acceptable (by a 54% to 24% margin) for employers to install monitoring cameras following a series of workplace thefts. Nearly half (47%) say the basic bargain offered by retail loyalty cards – namely, that stores track their purchases in exchange for occasional discounts – is acceptable to them, even as a third (32%) call it unacceptable.

<http://www.pewinternet.org/2016/01/14/privacy-and-information-sharing/>

Questions?

@jaclark

@weelibrarian

Slides available at <https://www.lib.montana.edu/~jason/talks.php>

Acknowledgements

I would like to thank Montana State University and my excellent colleagues at MSU Library for supporting my research.

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Further Reading

Anticipatory Design: Improving Search UX using Query Analysis & Machine Cues
JA Clark - Weave: Journal of Library User Experience, 2016
<http://dx.doi.org/10.3998/weave.12535642.0001.402>

“Privacy and Information Sharing” - Pew Research Center
<http://www.pewinternet.org/2016/01/14/privacy-and-information-sharing/>

“The State of Privacy in post-Snowden America” - Pew Research Center
<http://www.pewresearch.org/fact-tank/2016/09/21/the-state-of-privacy-in-america/>

pinboard.in tag

pinboard.in/u:jasonclark/t:search-ux/