What works well in search now?
Forecasting the Future

First: What are the larger trends?
   In technology?
   In society?

Next: Project out from these.
Preferences for Audio / Video / Touch

Preferences for Social Interaction

Preferences for Natural Language

Statistical Analysis of Enormous Collections Of Behavioral and Other Data

Wide adoption of social media & user-generated content

Advances in UI Design

“Natural” Interfaces
Trend: Spoken Input
Why Spoken Input?

- Phone-based devices widely used
  - Naturally accepts spoken input
  - Difficult to type on
- Touch screen interaction increasingly popular
  - Also difficult to type on
- Speech recognition technology is improving
  - Huge volumes of training data is now available

- What are the impediments?
We need a “cone of silence”
Alternative text entry

swype.com

Gesture search, Li 2010
Speaking leads to conversation

- Dialogue is a long-time dream of AI

- We’re getting closer with a combination of
  - Massive behavioral data
  - Intense machine learning research
  - Advanced user interface design
  - Real-time contextual information
Far Future Trend: Dialogue

- SIRI came out of the DARPA CALO project
What time is it?

It’s 2:26 pm on December 31, 2010.

What’s the phone number for Claremont vet

I’m looking for a telephone number for veterinarians named "Claremont" near your current location in Berkeley...

The telephone number for Claremont Veterinary Hospital on 5331 College Ave in Oakland is 510-652-5835.

Call: 510-652-5835

Claremont Veterinary Hospital
Oakland, 1.6 miles

Call

Veterinarian

How far away is that?

Campus Veterinary Clinic, a veterinarian, is at 1720 Shattuck Ave, Berkeley

You didn't specify a location, so I looked near here.
Trend: Social Search

People are Social; Computers are Lonely.

Don't Personalize Search, Socialize it!
Social Search

**Implicit**: Suggestions generated as a side-effect of search activity.

**Explicit**: Knowledge accumulating via the deliberate contributions of many.

**Collaborative**: Working with other people on a search task.

**Asking**: Communicating directly with others.
Social Search: People Collaborating
Social Search: People Collaborating
Social Search: People Collaborating

Expression 1:
E AND ((A OR B OR C) AND D)

Expression 2:
G AND H
# Social Search: Asking for Answers

What do people ask of their social networks?

<table>
<thead>
<tr>
<th>Type</th>
<th>%</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommendation</strong></td>
<td>29%</td>
<td>Building a new playlist – any ideas for good running songs?</td>
</tr>
<tr>
<td><strong>Opinion</strong></td>
<td>22%</td>
<td>I am wondering if I should buy the Kitchen-Aid ice cream maker?</td>
</tr>
<tr>
<td><strong>Factual</strong></td>
<td>17%</td>
<td>Anyone know a way to put Excel charts into LaTeX?</td>
</tr>
<tr>
<td><strong>Rhetorical</strong></td>
<td>14%</td>
<td>Why are men so stupid?</td>
</tr>
<tr>
<td><strong>Invitation</strong></td>
<td>9%</td>
<td>Who wants to go to Navya Lounge this evening?</td>
</tr>
<tr>
<td><strong>Favor</strong></td>
<td>4%</td>
<td>Need a babysitter in a big way tonight... anyone??</td>
</tr>
<tr>
<td><strong>Social connection</strong></td>
<td>3%</td>
<td>I am hiring in my team. Do you know anyone who would be interested?</td>
</tr>
<tr>
<td><strong>Offer</strong></td>
<td>1%</td>
<td>Could any of my friends use boys size 4 jeans?</td>
</tr>
</tbody>
</table>

Morris et al., CHI 2010
Social Search: Asking for Answers

Asking experts in a social network

Richardson and White, WWW 2011
Social Search: Explicit Help via Question-Answering Sites

- Content is produced in a manner amenable to searching for answers to questions.
- Search tends to work well on these sites and on the internet leading to these sites
  - Like an FAQ but
    - with many authors, and
    - with the questions that the audience really wants the answers to, and
    - written in the language the audience wants to use.
Advanced user interface design
Social Search: Implicit Suggestions

- Implicit human-generated suggestions still beat purely machine-generated ones
  - Spelling suggestions
  - Query term suggestions (“search as you type”)
  - Recommendations (books, movies, etc)
  - Ranking (using clickthrough statistics)
Social Search: Explicit Rec’dations

- “Crowdsourcing” for explicit recommendations
  - Digg, StumbleUpon
  - Delicious, Furl
  - Google’s SearchWiki (now defunct)
  - Open Directory
  - Blekko
Did you mean **dog racing**?

1 to 20 of 315K web results for **dog pacing**

**Establishment of a canine** model of cardiac memory using endocardial pacing

Establishment of a canine model of cardiac memory using endocardial pacing via internal jugular vein. Other articles by authors. Li Yue-chun, Ge Li-sha, Guang Xue-Qiang, Chen
biomedcentral.com/1471-2261/10/30/abstract Jun 2010

**Left ventricular septal and apex pacing** for optimal pump function in canine

biomedexperts.com/.../Left_ventricular_septal_and_apex_pac...}

**Bloat Article**

Helpful hints in deciding the bloat phase of a dog (Practice the following three actions on a well dog beforehand). To do this, stand over the dog facing the same direction as the dog.
canadasguidetodogs.com/health/healtharticle6.htm Nov 2003

**BEHAVIOR PROBLEMS IN GERIATRIC DOGS** by Wayne Hunthausen

westwoodanimalhospital.com/BhvArts/GeriatDogBhvProb.htm

**Understanding Canine Dementia**
Social Search: Seeing what people you know have seen

- Yahoo MyWeb, Google Social Search
Social Search: Explicit Suggestions
Building Knowledge

- Social knowledge management tools seem promising.
- Utilize the best of social networks, tagging, blogging, web page creation, wikis, and search.

Millen et al., CHI 2006
Trend: More Natural Queries
Trend: Longer, more natural queries

- The research suggests people prefer to state their information need rather than use keywords.
  - But after first using a search engine they quickly learned that full questions resulted in failure.

- Average query length continues to increase
  - In 2010 vs 2009, searches of 5-8 words were up 10%, while 1-2 word searches were down.

![U.S. keyword breakdown by percentage of clicks (4-week rolling period)](image)
Trend: Longer, more natural queries

- Information worded as questions is increasing on the web.
  - From social question-answering sites and forums.
  - Maps colloquial expression into technical.
Example: keywords failed
Example: ask as a question

how do I connect wii and dvd to my tv

Search

Nintendo - Customer Service | Wii - Connecting to the TV or VCR
Connecting to a VCR, DVD-R, Cable Box, etc. In order to connect a video game ... Once the cables are inserted and the Wii is powered on, put your TV on the ...
www.nintendo.com/consumer/systems/wii/en.../setupAV.jsp - Cached - Similar

How do you Connect your Wii to HDMI Input on LCD TV?
Jul 16, 2010 ... A Review of My DVDs. Related Links ... I too wanted to connect my Wii to my HD TV with something better than the standard cable. ...
www.brighthub.com/electronics/home-theater/.../35555.aspx - Cached - Similar

How can I connect my DirecTv, DVD player & Wii to the same flat TV ... Mar 16, 2009 ... that did not work. It has several holes for me to connect, yet it does not read. It can either do the DVD or the Wii. Hence I need to keep moving ...
www.answersbag.com/q_view/1124602 - Cached - Similar

Zolved - Connecting the Wii console to a TV or VCR
You are supplied with an AV Multi Out plug with the Wii console. This cable allows you to connect to a TV/VCR/Cable Box/DVD player etc. ...
www.zolved.com/synapse/view_content/19706 - Cached

Nintendo Wii: Connecting to a TV, VCR, HiFi
Connecting to a Television. Insert the AV Multi Out plug on the Wii AV ... to connect a video game system through a device such as a VCR, DVD recorder, ...
wii.nintendo-europe.com/57.html - Cached - Similar

How can I connect both my wii and a dvd player to my tv? - Yahoo ... May 1, 2010 ... the comcast cable box. I finally got the dvd player to work by ... While we are doing this, let's learn some of the right terminology. ...
answers.yahoo.com/question/index?qid... - Cached
Example: get an answer

Resolved Question
How can I connect both my Wii and a DVD player to my TV?

the comcast cable box.

I finally got the DVD player to work by putting it into the TV holes and setting the TV to aux. Where can I put the Wii to make that work too (I really don't want to switch the Wii with the DVD player every time I wanna use it)? Can I plug it into the cable box? And then what would I set the cable box to? Or the DVD player...?

4 months ago

Additional Details
Sorry the first part is supposed to say:

i have the three holes (red, white, and yellow) on the TV, the DVD player, and the comcast cable box.

4 months ago

Best Answer - Chosen by Asker

While we are doing this, let's learn some of the right terminology. The yellow, red, and white colored jacks are called composite video. On the back of your TV they would be composite video inputs while on the back of your DVD player, Wii, and cable box, they would be outputs.

So, no, you can not plug the Wii into the cable box because the cable box has the same color "holes" because what you would be doing is plugging the Wii output into a cable box output.

What you need to plug everything in to your TV is a composite video switch... one with at least 3 inputs. You then take the output of the switch to the TV's input.
Trend: More Natural Queries

- Blend two ideas:
  - “sloppy commands”
  - predictions based on user behavior data
- This is subtly and steadily increasing in sophistication across many interfaces
Sloppy Commands

- Like command languages, but
  - the user has a lot of flexibility in expression
  - so memorization is not required
    - “time graz” “what time is it in graz” “graz time now”
Sloppy Commands + Visual Feedback

- Can include rich visual feedback
  - Quicksilver in Apple
  - Inky by Miller et al.

![Image of Quicksilver and Inky examples]
Sloppy Commands + Rich Data

- Combine Mozilla’s Ubiquity and Freebase to make a flexible predictive query engine
  - By spencerwaterbed: http://vimeo.com/13992710
Sloppy Commands + Rich Data

![WolframAlpha](image-url)

**Input interpretation:**

- **Pizza:**
  - Amount: 2 slices
  - Type: with pepperoni

**Daily value ranking:**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>1.8 g</td>
<td>73%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>14 g</td>
<td>68%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>43 g</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sloppy Commands + Rich Data

WolframAlpha computation...knowledge engine

2 pieces of pizza with pepperoni

Using closest Wolfram|Alpha interpretation: 2 Piece of pie with pepperoni

Assuming any type of pie | Use pie, peach or | more | instead

Input interpretation:

<table>
<thead>
<tr>
<th>pie</th>
<th>amount</th>
<th>2 pieces</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>pepperoni</td>
<td>amount</td>
<td>245 grams</td>
<td></td>
</tr>
</tbody>
</table>

Total nutrition facts:

serving sizes (total: 479 g)

<table>
<thead>
<tr>
<th>pie</th>
<th>2 pieces (234 g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pepperoni</td>
<td>245 g</td>
</tr>
</tbody>
</table>

Individual nutrition facts
Summary

- As CS gets more sophisticated, we can build search interfaces that allow people to interact more naturally:
  - More language-like queries
  - Speaking & viewing rather than typing & reading
  - More able to interact with other people while doing search tasks
  - More able to use the knowledge in peoples’ heads
To the future!