

(The future of)
Online interactive media
(what sciences it will take)

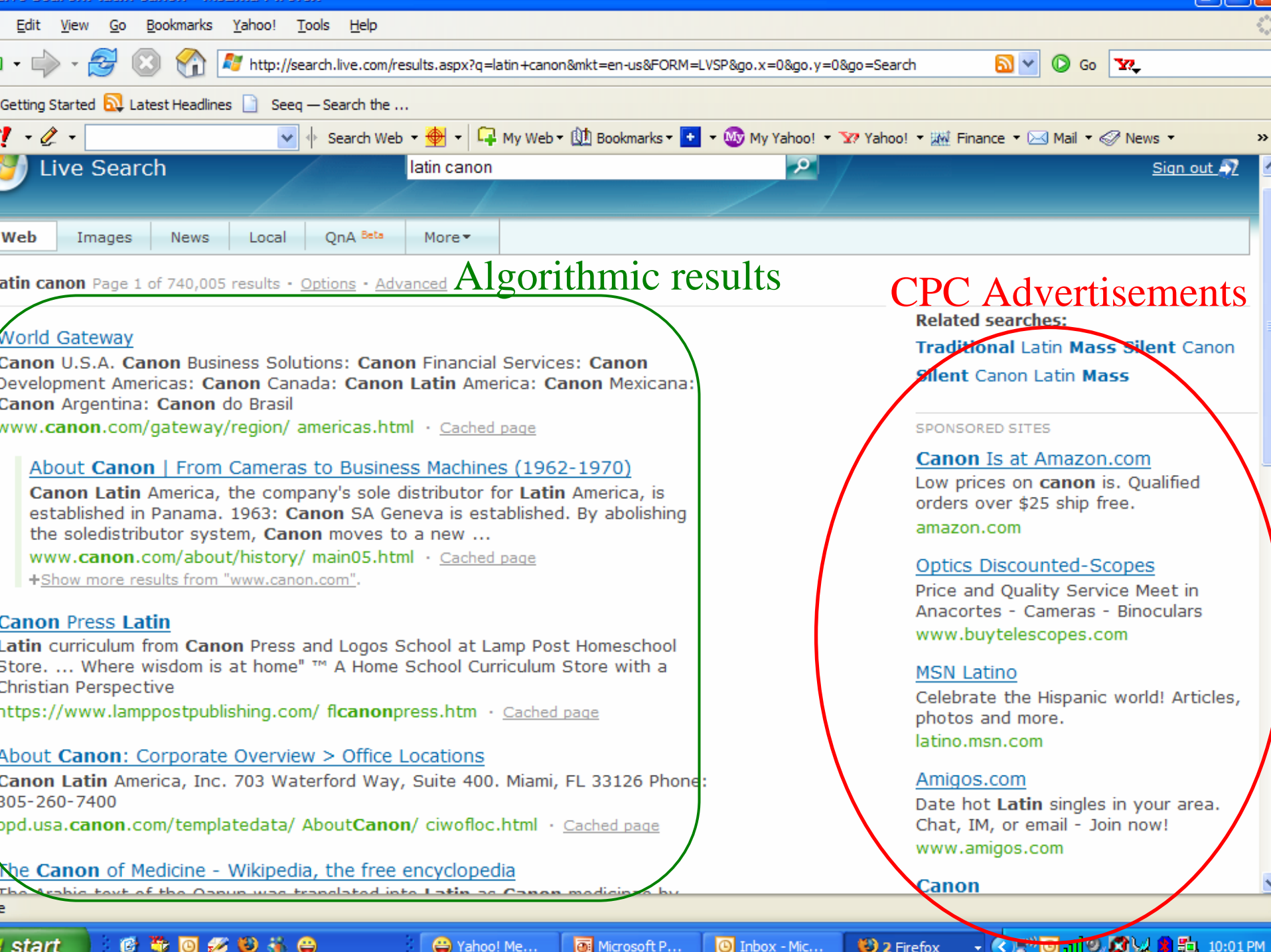


Prabhakar Raghavan
Yahoo! Research



Agenda

- Online media today
 - Long tails
- Data analysis
- Microeconomics
- Search
- Systems
- Media experiences



Algorithmic results

[World Gateway](#)

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www.canon.com/gateway/region/americas.html · [Cached page](#)

[About Canon | From Cameras to Business Machines \(1962-1970\)](#)

Canon Latin America, the company's sole distributor for **Latin America**, is established in Panama. 1963: **Canon SA Geneva** is established. By abolishing the soledistributor system, **Canon** moves to a new ...

www.canon.com/about/history/main05.html · [Cached page](#)

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[Canon Press Latin](#)

Latin curriculum from **Canon Press** and Logos School at Lamp Post Homeschool Store. ... Where wisdom is at home"™ A Home School Curriculum Store with a Christian Perspective

<https://www.lamppostpublishing.com/flcanonpress.htm> · [Cached page](#)

[About Canon: Corporate Overview > Office Locations](#)

Canon Latin America, Inc. 703 Waterford Way, Suite 400. Miami, FL 33126 Phone: 305-260-7400

ppd.usa.canon.com/templatedata/AboutCanon/ciwofloc.html · [Cached page](#)

[The Canon of Medicine - Wikipedia, the free encyclopedia](#)

The Arabic text of the Canon was translated into Latin as Canon medicinae by

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The **tundra** biome

Tundra is the coldest of all the biomes. **Tundra** comes from the Finnish word ... Arctic **tundra** is located in the northern hemisphere, encircling the north ...

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Tundra

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Tundra 5

There are two types of **tundra** in the world, Arctic and Alpine. The arctic **tundra** is at the top of the world around the North Pole. ...

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WPNT834 - RangeMax 240 Wireless Router
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... plus buying choices so you'll get the best Netgear WPNT834 RangeMax 240 price. ... line: Though the Netgear WPNT834 RangeMax 240 provides phenomenal throughput ...
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User reviews

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Search for questions: Search Advanced My Q&A


Home > Computers & Internet > Computer Networking

 Hello **PR**
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- All Categories
 - ↓ Computers & Internet
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Computer Networking

 **Top Computer Networking Answerer** Top 10 Answerers
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Answer Open Questions | **Discover** Resolved Questions | **Vote** Undecided Questions

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-  **How do i make a secure home network with a linksys wireless router?**
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-  **If you can access ther internet in safe mode with networking but not in normal boot up,?**
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Level 1

This question's communities

Add this question to
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Or enter a community:

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Pick the best answer

SillyBill...

I have two enthranet adapters and a hub,,,,, would bridging connection help speed?

Can I bridge my two enthranet cards with my speedstream dsle modem and a hub???

1 week ago (Tiebreaker) - 3 answers - [Report Abuse](#)

This question is no longer open for answering. Here's your chance to cast a vote if you haven't already. The voting period was extended because it ended in a tie.

0

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Search the Web to research your answer.

Answers

Show:

Social content

Answerer 1 That will not increase speed.
1 week ago - [Report Abuse](#)

Social capital



The online media enterprise

Content (and services)

Editorial
User-gen
Commercial

Search/IR

Users

Queries
Context
Community

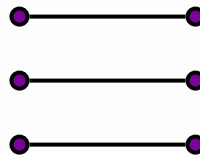
Media experiences

Feedback

Data

Matching

Microeconomics



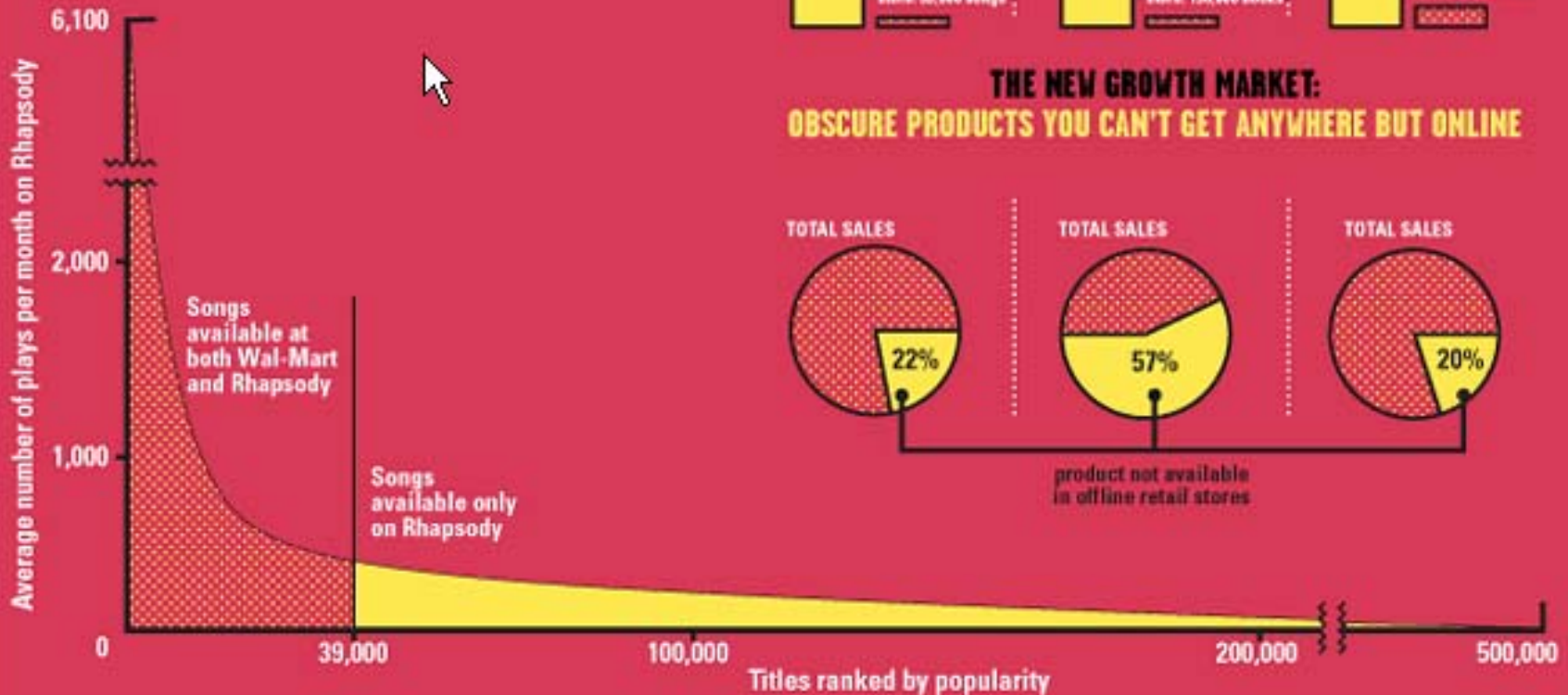
Community Systems



"The biggest money is in the smallest sales." [Kevin Laws]

ANATOMY OF THE LONG TAIL

Online services carry far more inventory than traditional retailers. Rhapsody, for example, offers 19 times as many songs as Wal-Mart's stock of 39,000 tunes. The appetite for Rhapsody's more obscure tunes (charted below in yellow) makes up the so-called Long Tail. Meanwhile, even as consumers flock to mainstream books, music, and films (right), there is real demand for niche fare found only online.



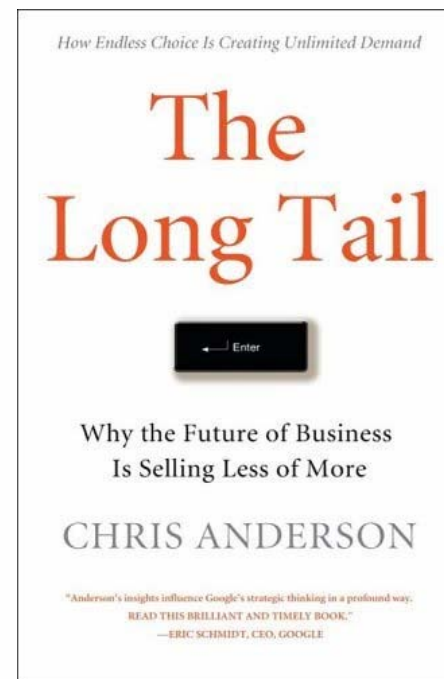


Long tails are all over

- The expected number of times a query is asked is a constant
 - But the mass in the tail is non-trivial.
- In the future, everyone will be famous to fifteen people.

The commonest human activity that leads to power laws is that scientists optimize computing artifacts.

– Papadimitriou





Data analysis and long tails

March 1997:

“Walmart currently operates a 7TB system, the largest in the world.”

- Today:
 - Yahoo! adds ~12TB per *day*
- How do we efficiently cull insights?
- What is the likely response of a user to a page view? (Response prediction)

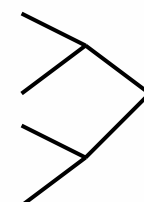
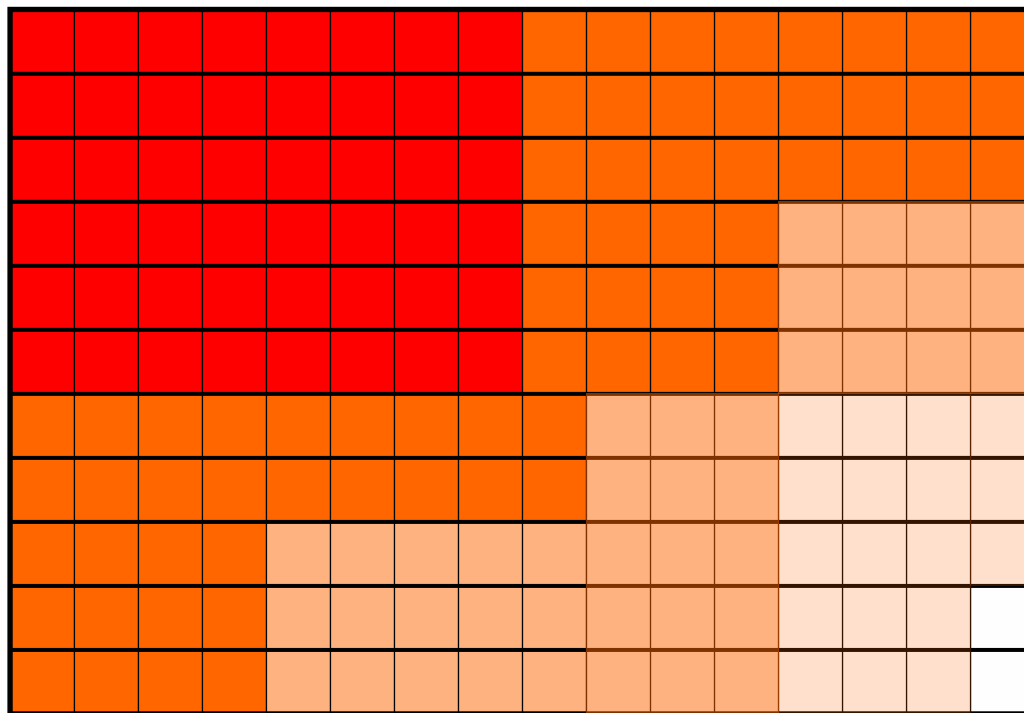


Learning in long-tailed spaces

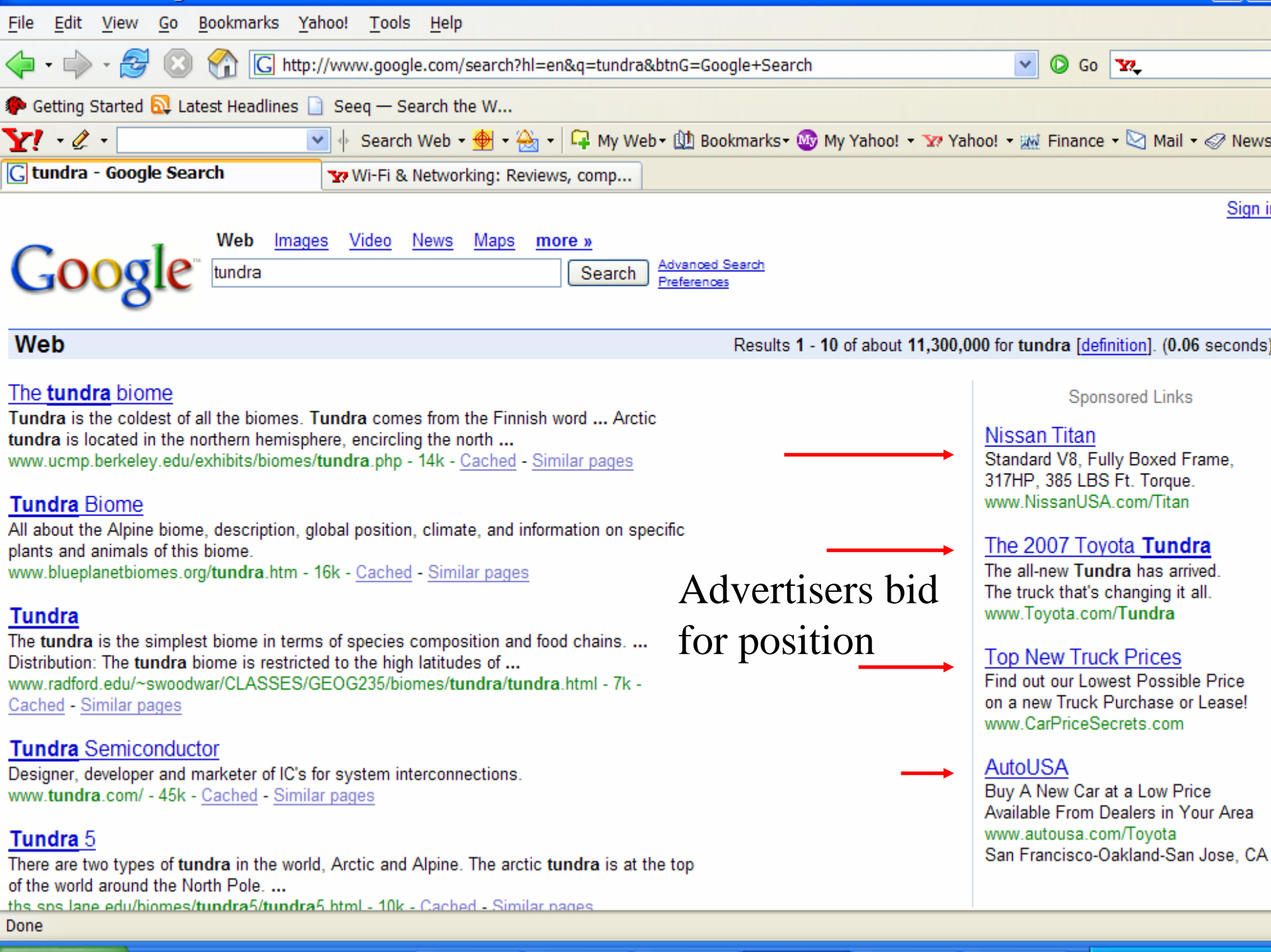
Features



Long-tailed sparsity



Domain info



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Advertisers bid for position





Economics of search

- Of the various advertisers for a keyword, which one(s) get shown?
- What do they pay on a click through?
- How does the auction mechanism affect advertiser behavior?
- The answers turn out to draw on insights from microeconomics



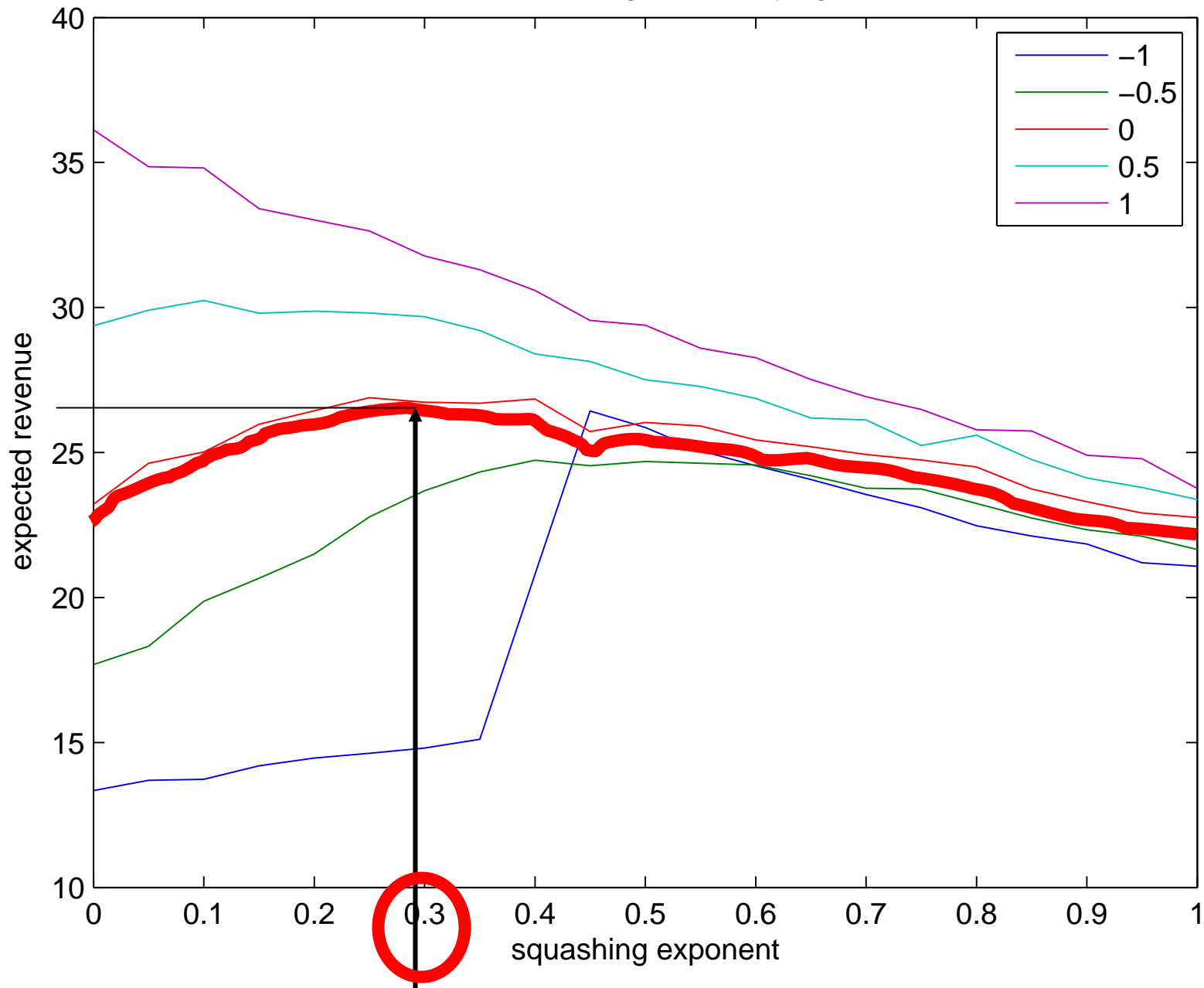
Search ad ordering

- Overture/Old Yahoo! scheme
 - Order ads by **bid**
- Google (supposedly)
 - Order by **bid × click-through rate (CTR)**
- Squashing (Lahaie/Pennock)



- **Key** – advertisers react to mechanism!

Revenue with Squashing under varying Correlation





Computational microeconomics

- Reputation and incentive mechanisms
- Matching marketplaces
 - Jobs, dates, ...
 - Online matching everywhere
 - Hardest part is estimating the payoffs, not the matching algorithm
- “Network effects”
 - Are 500 million users 500 times as valuable as a million users? 5000 times?

Ready to Participate?
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Categories

→ All Categories

Food & Drink

- Beer, Wine & Spirits
- Cooking & Recipes
- Entertaining
- Ethnic Cuisine
- Non-Alcoholic Drinks
- Other - Food & Drink
- Vegetarian & Vegan

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[where can I go to get me slim?](#)



Search and content supply

- Premise:
 - People don't want to search
 - People want to get tasks done

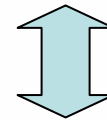




What is missing?

- Information integration
 - Information extraction
 - Schema normalization
- Social structure
- Incentive mechanisms

hotel near leicester square



Search

Welcome to The Savoy

Located on The Strand in the heart of the West End theatre district,

Tags / jaguar / clusters

 [SEARCH](#)

(Or, try an [advanced search](#).)



[car](#), [cars](#), [auto](#), [etype](#), [automobile](#), [classic](#), [vintage](#), [autoshow](#), [red](#), [show](#)

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Millions of users upload photos
Tag them with text labels
Anyone can tag!

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These are the *most recent* photos tagged with jaguar. [See more...](#)



Luis von Ahn, CMU

1 MILLION LABELS COLLECTED

TOP SCORES

HOW TO PLAY

New to the ESP Game?
[Sign up for FREE!](#)

The ESP Game beta

As seen on CNN and newspapers around the world!

The screenshot shows the game interface with the following elements:

- Time Left:** 0:09
- Score:** 0077
- Image:** A hallway with a green dot labeled "common image".
- Taboo Words:** HOUSE, PLANT, ROOM
- Your Guesses:** CORRIDOR, COLUMNS
- Input:** "Your partner wants to pass" above a text box with "Type your next guess:" and a "Pass" button.
- Progress:** A progress bar with a green dot labeled "progress".
- Buttons:** "Pass" (yellow) and "Flag" (orange).
- Footer:** © 2002-2003 Carnegie Mellon University. All rights reserved.



Systems for online media

- Yesterday: Distributed systems and SQL middleware for enterprises
- Today: Planet-scale mainframes from unreliable components, simple data handling primitives
- What is the middleware for community applications?
 - Build, operate and grow niche communities
 - The long tail appears (unused) again ...



Media experience research

- 30 years ago, an eclectic collection of sociologists, cognitive psychologists and ethnographers gave us
 - The personal computer
 - The field of HCI/CHI





Media experience design

- The science of online audience engagement
 - Not just about people interacting with computers or the web
 - But about people interacting with other people (With computers/the web as the medium)
- An intrinsically *data-driven* science



A new convergence

- Monetization and economic value an intrinsic part of system design
 - Not an afterthought
 - Mistakes are costly!
- Computing meets humanities like never before – sociology, economics, anthropology ...

Thank you.



Questions?

pragh@yahoo-inc.com

<http://research.yahoo.com>