Personalization and Privacy

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Big Data? Why Share?

Currently

• User data aggregated in cloud

• This data is *toxic*
  – Compliance with privacy policies
  – Compliance with laws, local and international
  – Powering the data center

• The only upside is learning more about user

Our vision

• Keep user data local to user

• Do user profiling on device

• Do it *better* and *cheaper*

• Share very little and only when needed
Share data to get personalized results

Privacy concerns
Browser: Personalization & Privacy

- Broad applications:
  - Site personalization
  - Personalized search
  - Ads

- User data in browser
- Control information release

Browsing history

Distill

Top: Computers: Security
Top: Arts: Movies
Top: Sports: Hockey
Top: Science: Math
Top: Recreation: Outdoors

User interest profile

Top: Computers: Security
Top: Arts: Movies
Top: Sports: Hockey
Top: Science: Math
Top: Recreation: Outdoors

Amazon

Netflix

Google
bn.com would like to learn your top interests. We will let them know you are interested in:

- Science
- Technology
- Outdoors

[Accept] [Decline]
RePriv Protocol

GET /index.html HTTP 1.1
Host: www.example.com
Accept: repriv ...

HTTP/1.1 300 Multiple Choices
index.html
index.html?top-n&level=m

POST /index.html HTTP 1.1
Host: www.example.com
Content-Length: x
category1=c1&...

HTTP/1.1 200 OK

Personalized page content
Privacy-Aware News Personalization

1. Map RePriv interest taxonomy to del.icio.us topics
2. Query personal store for top interests
3. Ask del.icio.us API for “hot” stories in appropriate topic areas from nytimes.com
4. Replace nytimes.com front page with del.icio.us stories
Privacy Policy

Change “href” attribute of anchor elements on nytimes.com

Change TextContent of selected anchor and div elements on nytimes.com
User profile:
- Games/Card_Games
- Games/Conventions
- Games/Video_Games

Do Video Games Equal Less Crime?

That's one theory for the continuing fall in crime, despite the recession.

Gamers Finally Get Their Wheaties Box ...sort of

Dr Pepper is featuring the Halo 3 player Tom Taylor, who goes by Tsquared, on the labels, which will appear on about 175 million 20-ounce bottles from January to April.

Sony To Shut its SF Metreon PlayStation store

Sony is closing down its one-and-only U.S. PlayStation store at the Metreon mall in San Francisco. The recession is clearly to blame, but it's happening at time when Microsoft - which opened and shut its own Microsoft store at the Metreon - is going to open a chain of its own stores.

Microsoft Takes on Cable With Xbox Streaming Video

If talks with Disney work out, the game console could stream ESPN content, making it that much easier to watch TV without cable.

Some Video Gamers Leery of Obama's Views

Gamers are worried that the president-elect's positions on video games may signal new regulations or restrictions on the industry.
News Personalization: Effectiveness

- **Personalized**
  - Most responses rated highly!

- **Random**
  - Most responses rated poorly

- **Default**

**User Relevance Score**

0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10
RePriv Summary

• Existing solutions require privacy sacrifice

• RePriv is a browser-based solution
  – User retains control of personal information
  – High-quality information mined from browser use
  – General-purpose mining useful & performant
  – Flexibility with rigorous guarantees of privacy

• Personalized content & privacy can coexist
Aggressive, privacy-conscious personalization for Windows Phone
Powerful Insight About User on Mobile

INBOX

Marc Boyer
Invitation: Check this out
When: Wednesday, April 06 10:00 AM

Luis Alverca
Current: status on project
Great news, the timing is going to work.

Kim Akers
Where are we going for Dinner? I vote for Coho Winery!

Ezio Alboni
I'm going to need those documents. Please send them over when they're ready.

Shai Bassli
Did you have fun on your trip?

ARI SUMOMINEN. Messenger

defense soon.

Awesome! I'm swithcing to
defense in a month.

Cool.

Want to grab a beer tomorrow and strategize?

Yeah, let's invite James too.

Ari Sumominen is available.

defense in a month.

4:36p

4:39p

4:37p

4:37p

4:38p

Chat on Messenger

SPORTS TRACKER

Welcome

Workouts: 142
Total Time: 39:23:20
Distance: 184.49 km
Energy: 6496 kcal

Diary
Settings

start new workout

Wake: 07:36
Sunrise: 07:36
Analogy: Location Access

• Location/GPS access has changed mobile apps as we know them today

• Location APIs are widely used by 3rd-party apps

• Want to do the same for persona data
Profiling the User on the Device

• MoRePriv was built into WP 7.5:
  – Persona mining
  – Universal personalization
  – Persona APIs for apps
Allow Access to MoRePriv Profile?

Flixster Movie Recommendations
PUBLISHED BY: Flixster

Flixster Movie Recommendations is requesting access to your MoRePriv profile information. You currently do not allow apps access to MoRePriv profile data. If you would like to enable access to your profile, tap Allow. If you don't want to allow access to your location, tap Cancel and the app will not perform MoRePriv personalization.

Apps may only request the persona which most closely resembles you.

Apps may only request the top profile: the persona that most closely resembles you. Your current top profile is Technophile.

Allow Cancel

M O R E P R I V P E R S O N A L I Z A T I O N

settings

Activist Bachelor

Executive Football Dad

Retiree Soccer Mom

Technophile Tween

...
Mobile Personalization: Example

- Soccer Mom
  - MORSS
  - Breaking: Bravo to Re-Edit 'Real Housewives' Segments in Wake of Suicide - Reuters
  - Kris Humphries and Kim Kardashian: rehearsal dinner in Beverly Hills - Los Angeles Times
  - Bill Clinton boots burgers, says he's now vegan - CBS News
  - HP's PC Spinoff Would 'Reinvent' Company, Return to Roots - Bloomberg
  - Marijuana DNA Sequenced by Startup - Bloomberg

- No Personalization
  - MORSS
  - Syria protests: Deaths in anti-Assad demonstrations - BBC News
  - Egypt protests to Israel over killings - Aljazeera.net
  - Libyan rebels 'capture' city near Tripoli - Aljazeera.net
  - Kabul Attack on British Compound Linked to Pakistan, Police Chief Says - ABC News
  - Anders Behring Breivik back in court: lawyer says gunman is 'lonely' - Telegraph.co.uk

- Technophile
  - MORSS
  - Storm Threatens Memorial Dedication - Wall Street Journal
  - Will Jobs' departure shake up the mobile industry? - Computerworld
  - Reports: TouchPad Gets First Taste of Android - DailyTech
  - Danica Patrick all in with NASCAR - ESPN
  - City Island - The Inquirer
Personalizing Yelp Listings

Executive

Duos Lounge
I’m going to throw my 30th birthday here! Great small plates and tapas lounge right off the West Seattle Bridge on Avalon Way. The interior is a cozy,...
Tapas Bars, American (New), Lounges

Phoenecia
A couple good friends of ours live right off Alki, just a block or two up from Phoenecia, and they had been raving about this place for months. They...
Tapas Bars, Wine Bars, Pizza

Bottlehouse
I cannot wait to go back. I live in LA and I wish there anything remotely like BOTTLEHOUSE here. But alas, I have to wait for my annual trip up north to...
Wine Bars, Tapas/Small Plates

The Harvest Vine
Snagged a last minute reservation here for Christmas eve dinner. When we walked in, the narrow dining hall gave a false impression that we had to wait...
Tapas Bars, Spanish, Basque

Student

Ballard Smoke Shop
Cheap, stiff drinks. Great people watching. Awesome bartenders. Those ladies are sweet AND sassy: free soup and just an all around good time. Ballard...
American (Traditional), Dive Bars, Breakfast & Brunch

Pacific Inn Pub
Fish and chips are great and all the sandwiches I have tried have been yummy including the Rueben in particular. They always have Fremont IPA on tap which...
Dive Bars, American (Traditional)

Cafe Racer Espresso
My go to breakfast place for a Sunday. Love the combination of cheese and cool obscure music videos they play on the old CRT tv - always good for a chuckle...
Coffee & Tea, Breakfast & Brunch, Sandwiches

The Twilight Exit
I love Twilight Exit. I live a couple blocks from this place and I’m here at least once a week. It’s a neighborhood bar and nothing more than that - I...
Dive Bars, American (Traditional)
Text Summarization

Generic excerpt

For a “technophile”

For a “business professional”
MoRePriv Summary

• Profile users on the device itself
• MoRePriv uses personas to represent user
  – Allow for personalization
  – Can be as ubiquitous as location info is now
  – Leaking personas is not such as big deal
• Personalized content & privacy can coexist