



# INTERNET TECHNOLOGY: LIBERATING OR CONTROLLING?

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Dr. Farid Farahmand

War & Peace Series

Updated: Fall 2015



# INTERNET TECHNOLOGY: LIBERATING OR CONTROLLING?

PART III – HOW ALGORITHMS RULE THE INTERNET & WHY WE  
SHOULD CARE

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Dr. Farid Farahmand

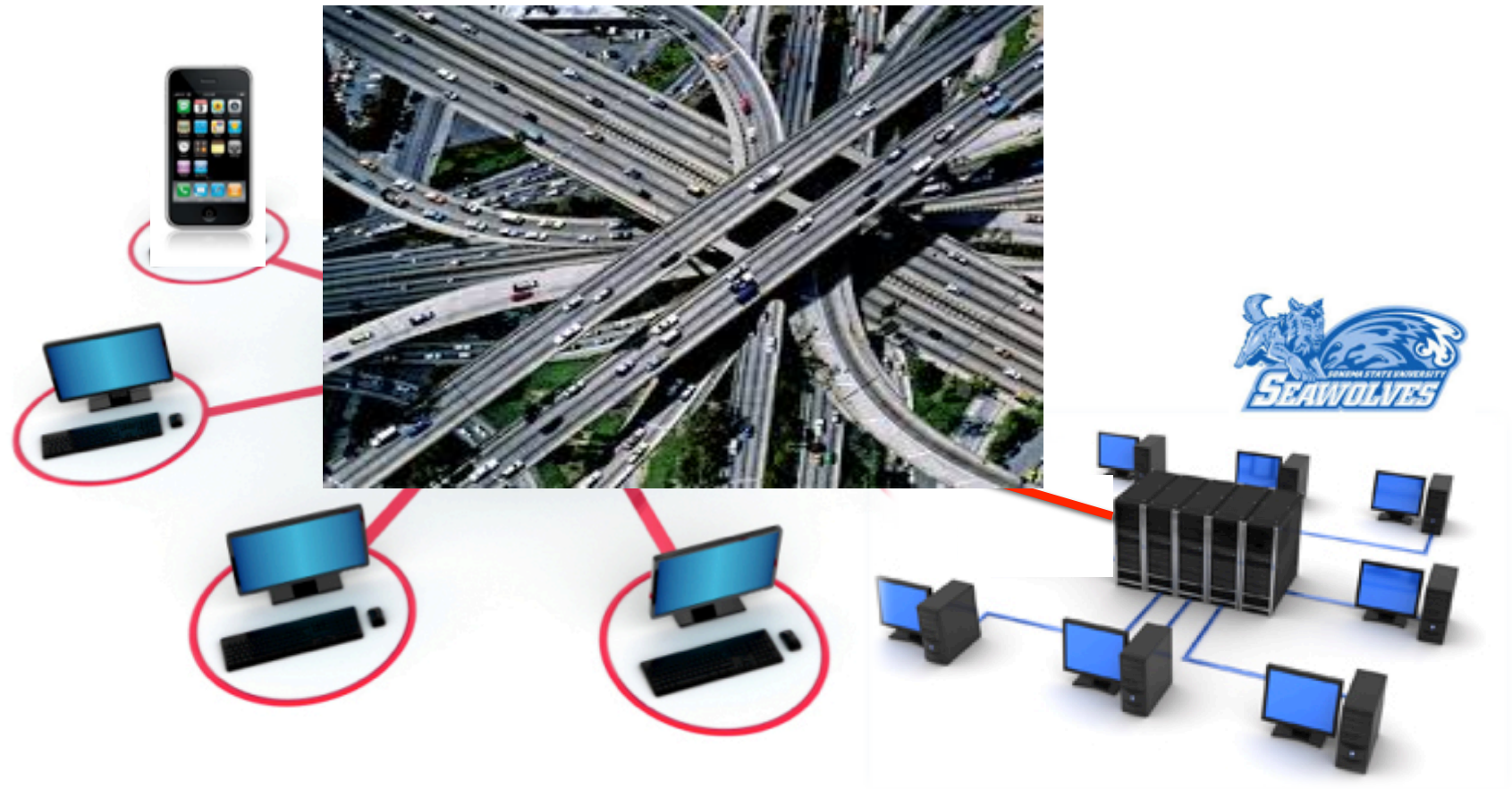
War & Peace Series

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Is the Internet technology  
giving us more control  
OR  
taking us under control  
?

# What is the Internet?

- The The **Internet** is the **global system of interconnection** between devices – e.g., computers, cell phone, tablets, cars
- The Network of Networks!
- Connecting everyone together – road system!



# Internet & WWW

- The **World Wide Web** is a technology that can provides many **services** over the Internet

## Internet Services

- Finding Directions
- Shopping
- Chatting
- Music
- News
- File Sharing

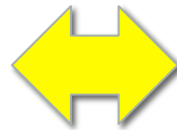


# Web Browsers

- The **software** connecting us to the Internet and allowing us to use available services
- Different in terms of speed, desktop tools, resource utilization, portability, the way they categorize the search, etc.
- There are many common browsers

## Internet Services

- Chatting
- Shopping
- Chatting
- Music
- News
- File Sharing



# Web Browsers

- Uncommon ones.....



Cruz



Stainless



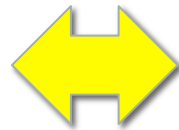
Flock



Arora

## Internet Services

- Chatting
- Shopping
- Chatting
- Music
- News
- File Sharing



firefox



safari



google  
chrome



internet  
explorer

# Access to the Internet Services

- Using Web browsers
- Evolutionary path
- Increasingly via Smartphones

PCs:  
Promising  
Individual  
Freedom



Mainframes:  
Large machines,  
Limited access



Laptops:  
Offering mobility



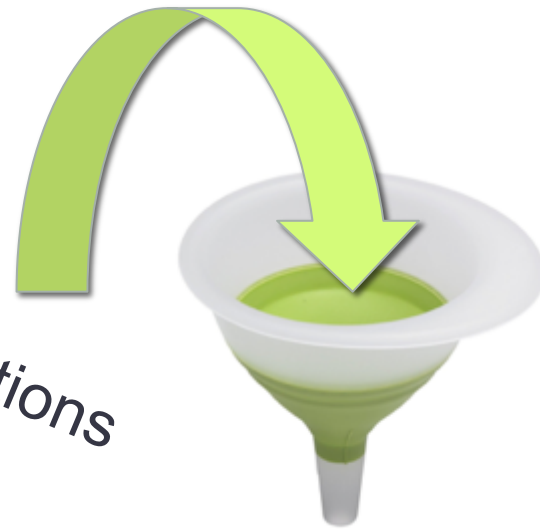
Smart Phones:  
Anytime, anywhere!  
(smaller & more powerful)

Today about **half** of Internet users in the U.S. use their smartphones to get online!



# Smartphones: Integrated Part of Our Lives!

- Finding Directions
- Shopping
- Chatting
- Music
- News
- Contacts
- File Sharing
- email



1.75 Billion Cellphones in 2014  
748 million Androids in 2013  
125 million iPhones in 2012  
53 million iPads in 2012

# Smartphones: Use Them Anywhere, Anytime!

Americans spend **22 hours/day** with their smartphones!

**3.37 Billion** worldwide email accounts



**Teens** send an average of **60 texts** a day,

40 percent of people with iPhones said they'd rather give up brushing their teeth for a week than go without their phone! (Chicago Tribune, 2011 )



Percent who said they could only go a few hours without their mobile phone: **34%**



**tick tick tick!**  
Americans use approximately **Minutes Per Day**  
(That's about **21 minutes** per person)



Have access to cell phones

Text Blindfolded!

## Cell phones around the **WORLD**

Highest average number of cell phones per person

1. United Arab Emirates 1.95
2. Estonia 1.94
3. Hong Kong 1.61
4. Italy 1.52
5. Bulgaria 1.47
6. Lithuania 1.41
7. Portugal 1.39
8. Singapore 1.36
9. Czech Republic 1.34
10. Russia 1.33

My cellphone  
battery is dead!



How  
THE INTERNET  
Works *In TWO Minutes!*

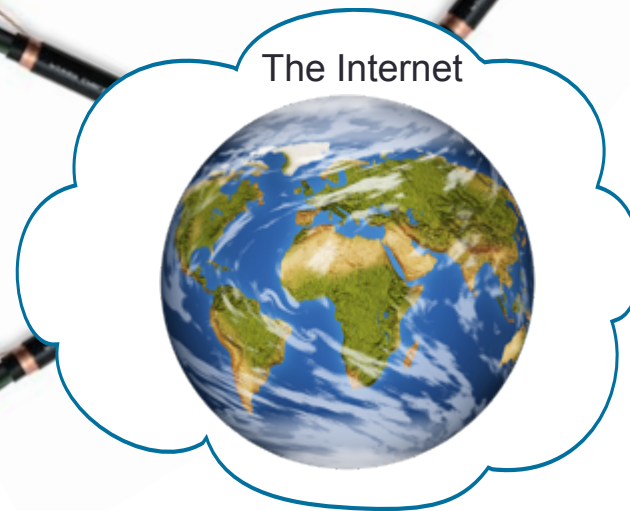
# The Internet In Action

Internet Service Provider (ISP)



Internet-enabled Devices

Physical Connection



# The Internet In Action

Internet Service Provider (ISP)



Internet-enabled Devices

Physical Connection

The Internet

fakebook

# The Internet In Action

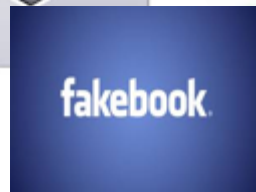
Internet Service Provider (ISP)



Physical Connection



Internet-enabled Devices

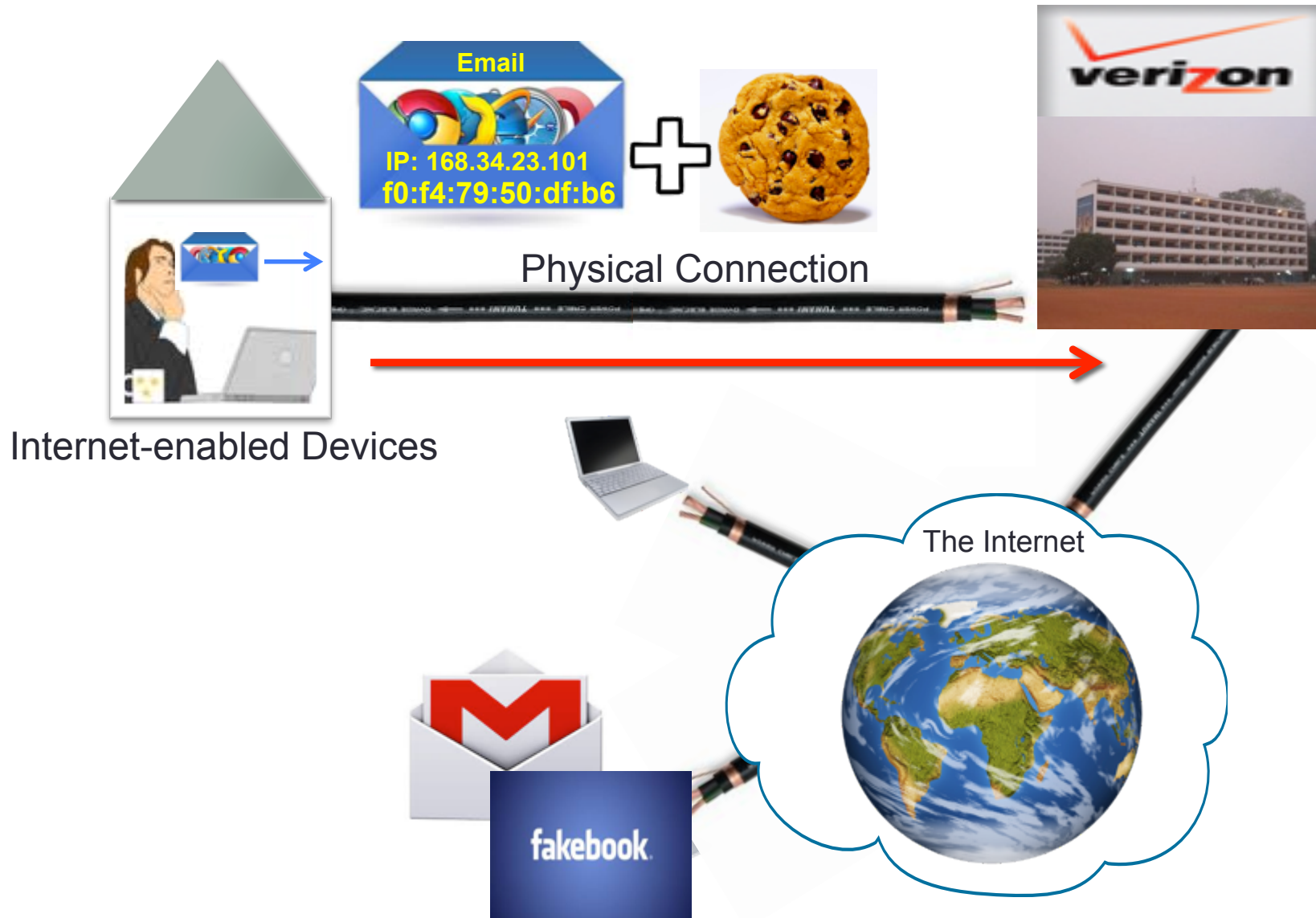


The Internet



# The Internet In Action

Internet Service Provider (ISP)



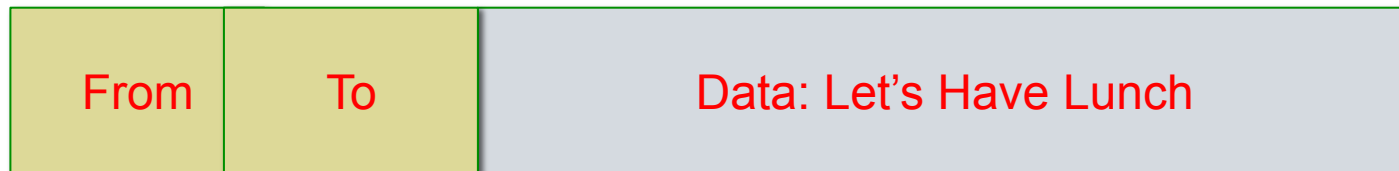


# The Internet In Action – Metadata Monitoring

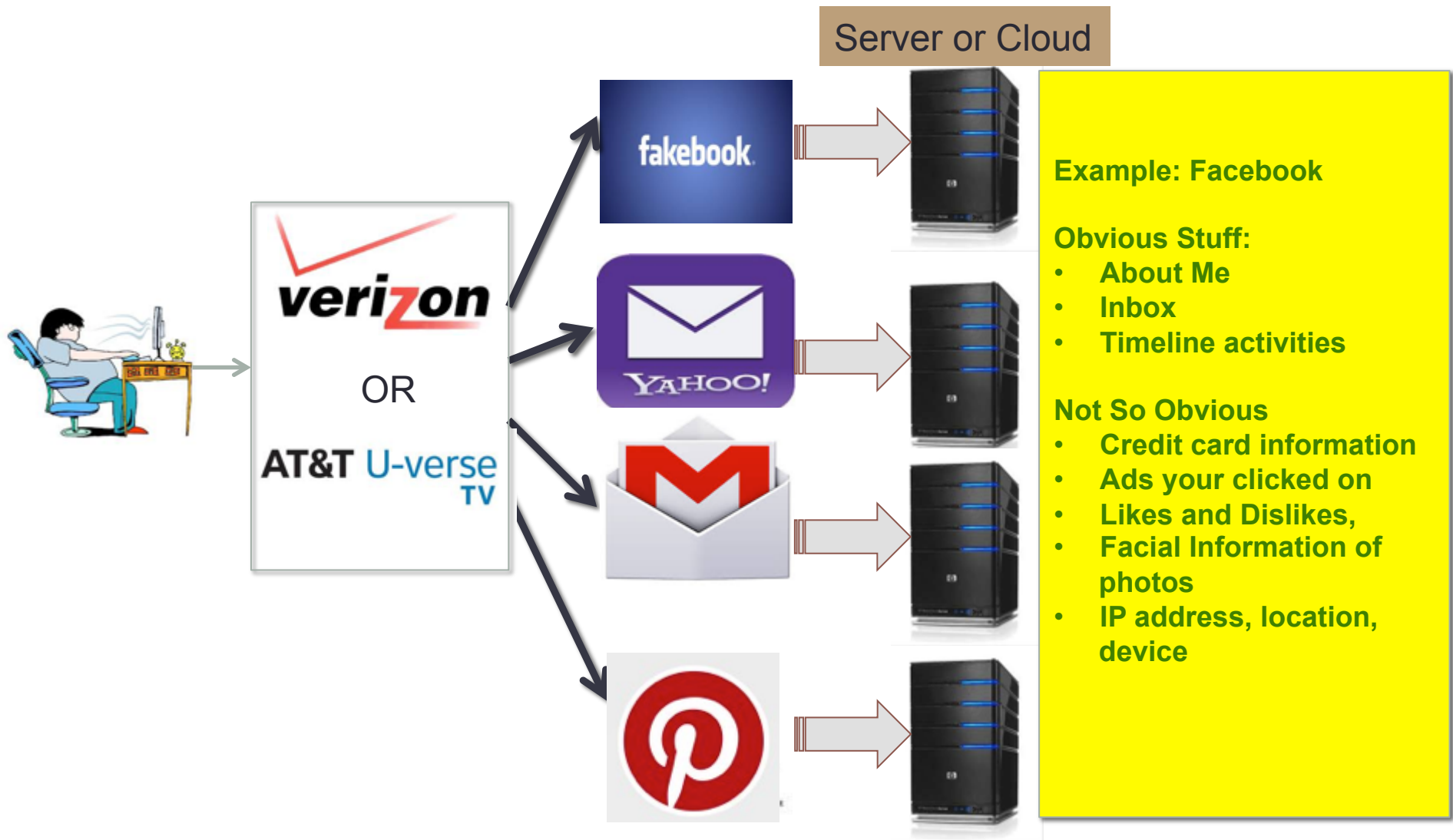


Metadata –  
NOT Encrypted)


Data Content (Payload) –  
Maybe Encrypted



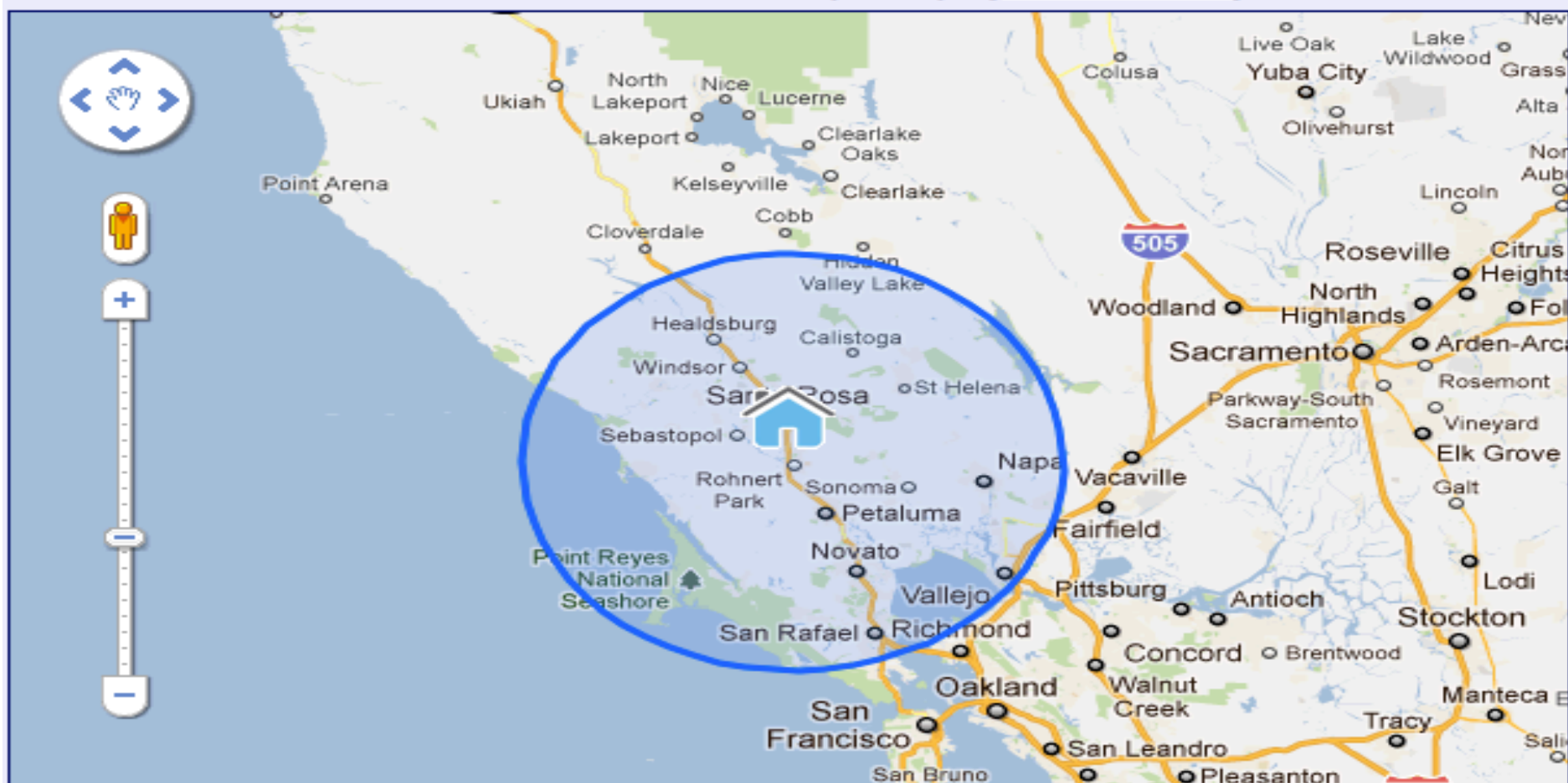
# The Big Picture



## Email Header Analysis

**IP Address:** 130.157.158.211  
**Hostname:** village-158-211.sonoma.edu  
**IP Address Country:** United States   
**IP Continent:** North America  
**IP Address City Location:** Rohnert Park  
**IP Address Region:** California  
**IP Address Latitude:** 38.3433,  
**IP Address Longitude:** -122.7041  
**Organization:** Sonoma State University  
**ISP:** Sonoma State University

### Email Lookup Map ([show/hide](#))



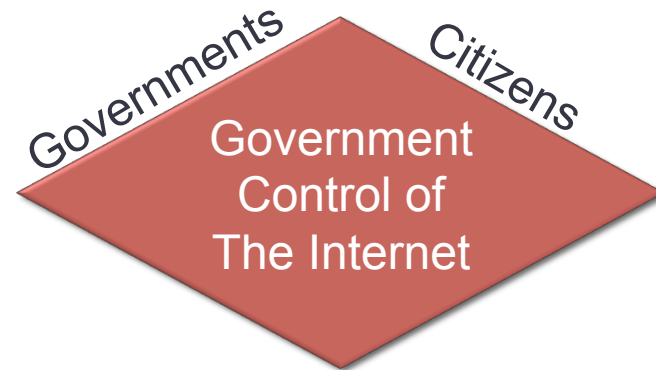
Internet has changed our lives!

Yet,  
It is increasingly  
becoming a tool to monitor & control!

# Internet: Enabling Technology of Control ...for justifiable reasons!



EDWARD SNOWDEN



## **In The Name of:**

- 1-National Security
  - Terrorism
  - Preserve sovereignty
- 2-National Laws
  - cyber crime
  - child porn.,
  - Gambling,
  - Intel. property rights,
  - etc.)

# Internet: Enabling Technology of Control

...for justifiable reasons!

Employees  
Corporate  
Control of  
Consumers

Governments  
Government  
Control of  
Citizens

## **Algorithms**

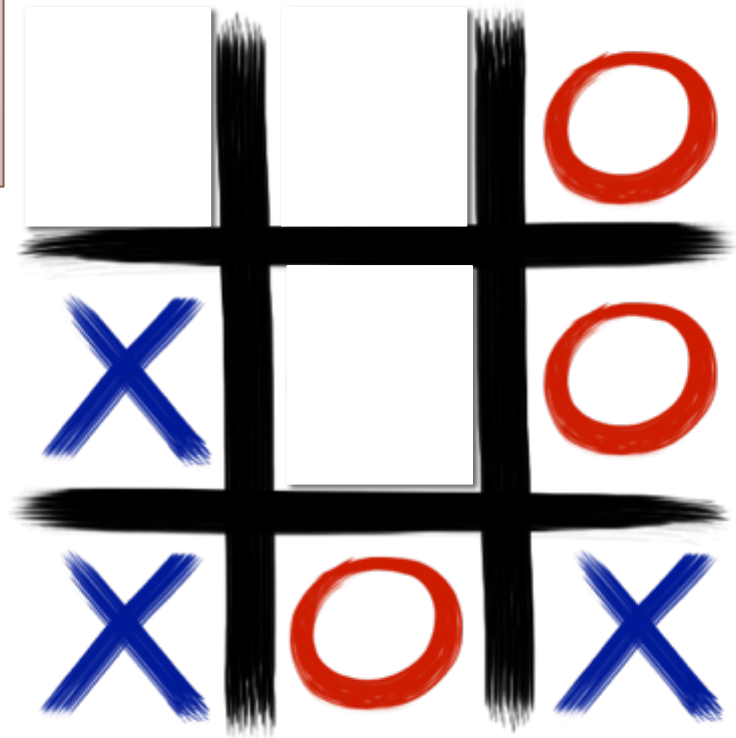
**are the enabling tool over the Internet to monitor us and manipulate our choices!**

- **So what are these algorithms?**
- **Where and how are they being used?**

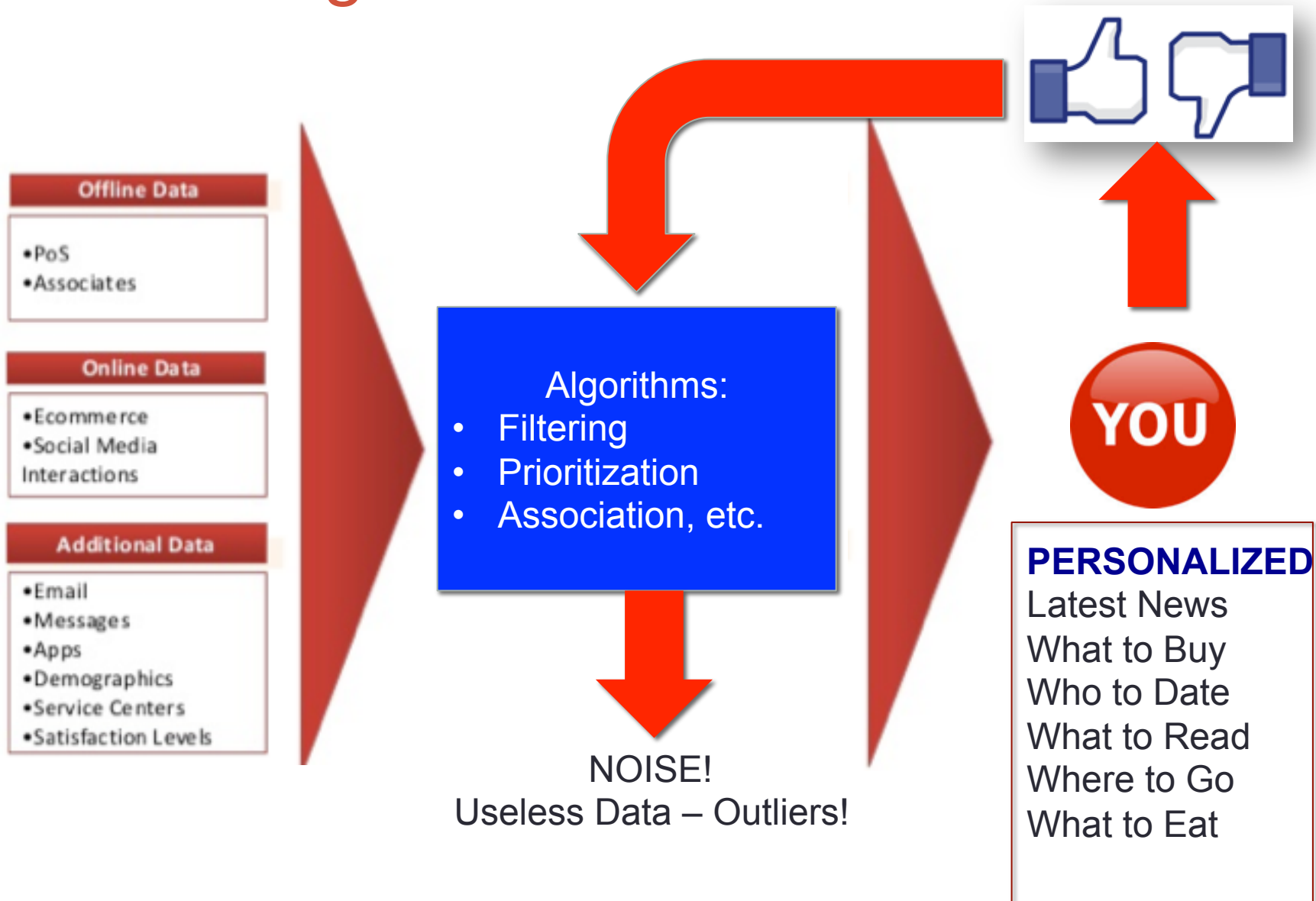
# Purpose of Predictive Algorithm

An “algorithm” is just a piece of computer code that makes a decision or recommendation of some kind.

**Algorithms**  
create models to  
**Predict**  
(what is likely to  
happen!)



# Internet Algorithms





# Were Are Algorithms Being Used?

...All in pursue of personalizing your content

- Google (1.17 Billion users in December 2012)

- What is the news and what to **SEARCH** for

- Amazon (270 Million accounts)

- What to **PURCHASE** next

- Facebook (1.15 Billion users)

- What is **INTERESTING**

- Netflix (60 million subscribers)

- What **MOVIES** to watch

- OkCupid (12 Million users between 29-85 years old)

- Who to **DATE**

- Pandora (8.2 Million paying subscribers)

- What to **LISTEN** to



**Our Mission:**

To make the world more open and connected

**facebook**



# About Facebook

The Facebook logo, consisting of the word "facebook" in white lowercase letters on a blue rectangular background.

- Today, with 1.1 Billion users, Facebook users collectively spend **10 Billion** minutes online!
- Facebook knows you better than your mother and certainly better than yourself!
  - Knows about your political views, where you live, how many credit cards you own, what job you hold, knows all your friends, AND

..... and it knows who you should hook up with!

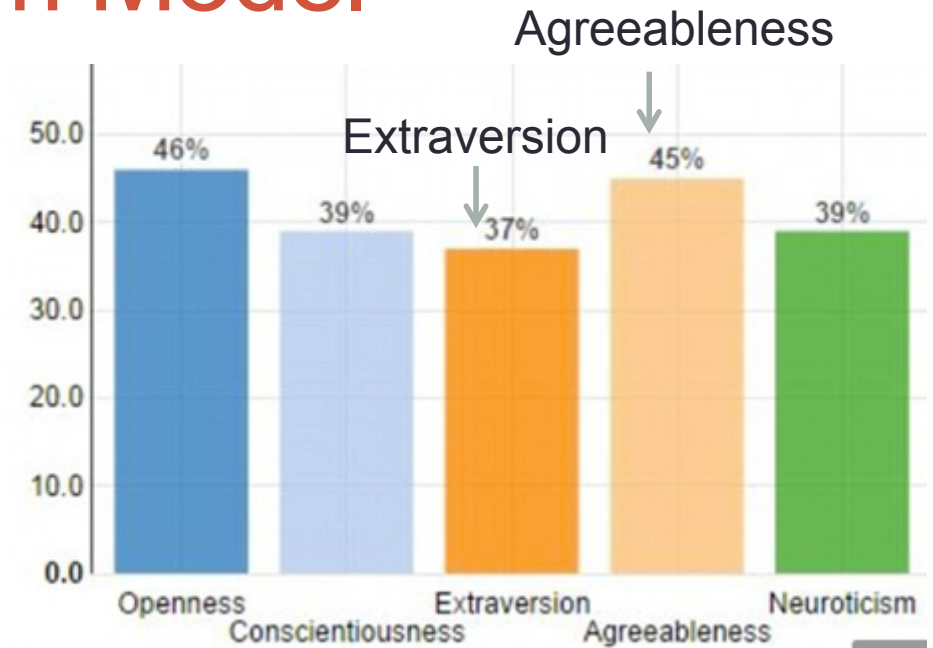


Marry Him! You  
will be Happy!

facebook

# Facebook Algorithm Model

- FB's business model is based efficient use of **USER's data**
- Using the available data **algorithms** can predict your general personality



High levels of extraversion commonly Liked reality TV star Snooki,

# Facebook Algorithms



- Facebook has been using **EdgeRank** algorithm
  - Finding your old high-school friends & past co-workers
- Facebook introduced Digital Assistance Algorithm, **M**
  - Facebook intends to apply M to our Facebook Data to help us **BUY** better gifts, books, reserve tables at restaurants, watch better movies, and more pleasant music!
- Facebook's Facial Recognition Algorithm, **FRA**
  - Facebook's FRA picks out faces in your photos and if a face matches one you previously tagged in another album, Facebook may suggest that person's name for you!

**300 likes  
and it knows  
you better  
than your  
spouse.**

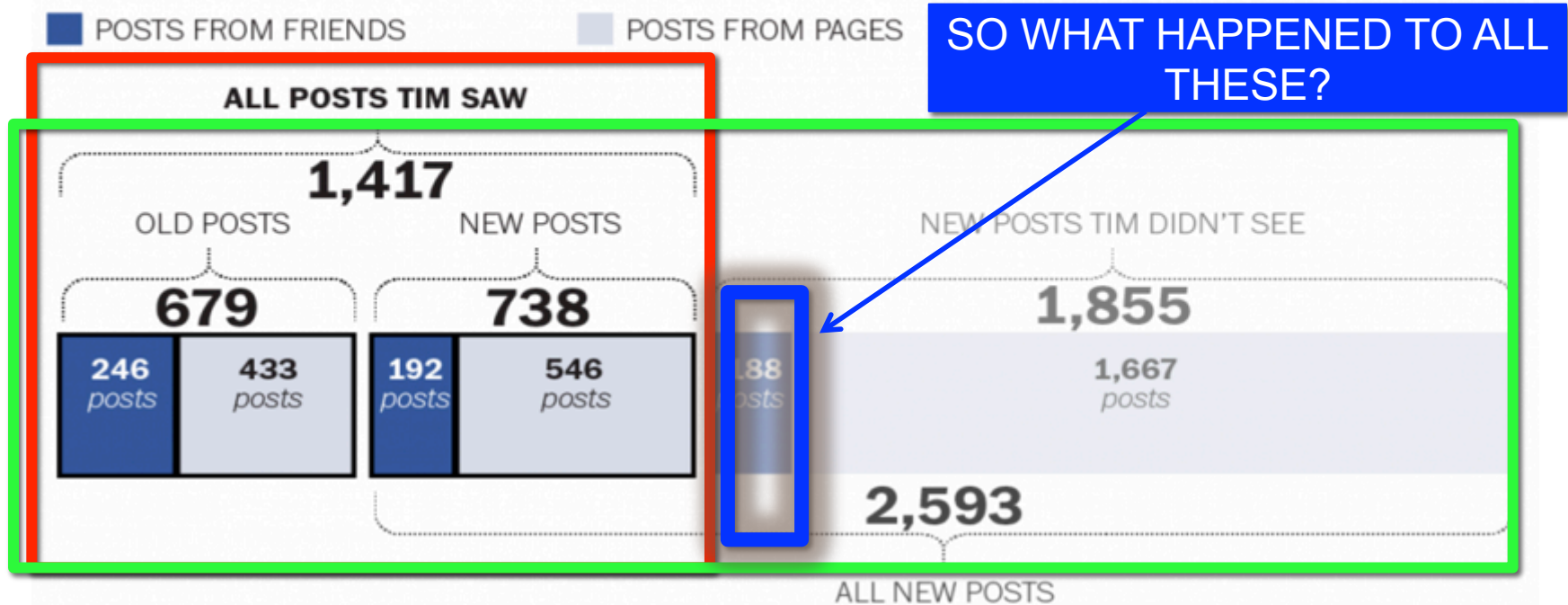
Image Source: Flickr/Brian Tomlinson

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# Facebook Personalizing Algorithms

It's not just your imagination - there are a lot of old posts in your Facebook feed

In an experiment, nearly half of the posts displayed in the News Feed were made on previous days. And the majority of new posts weren't displayed at all.

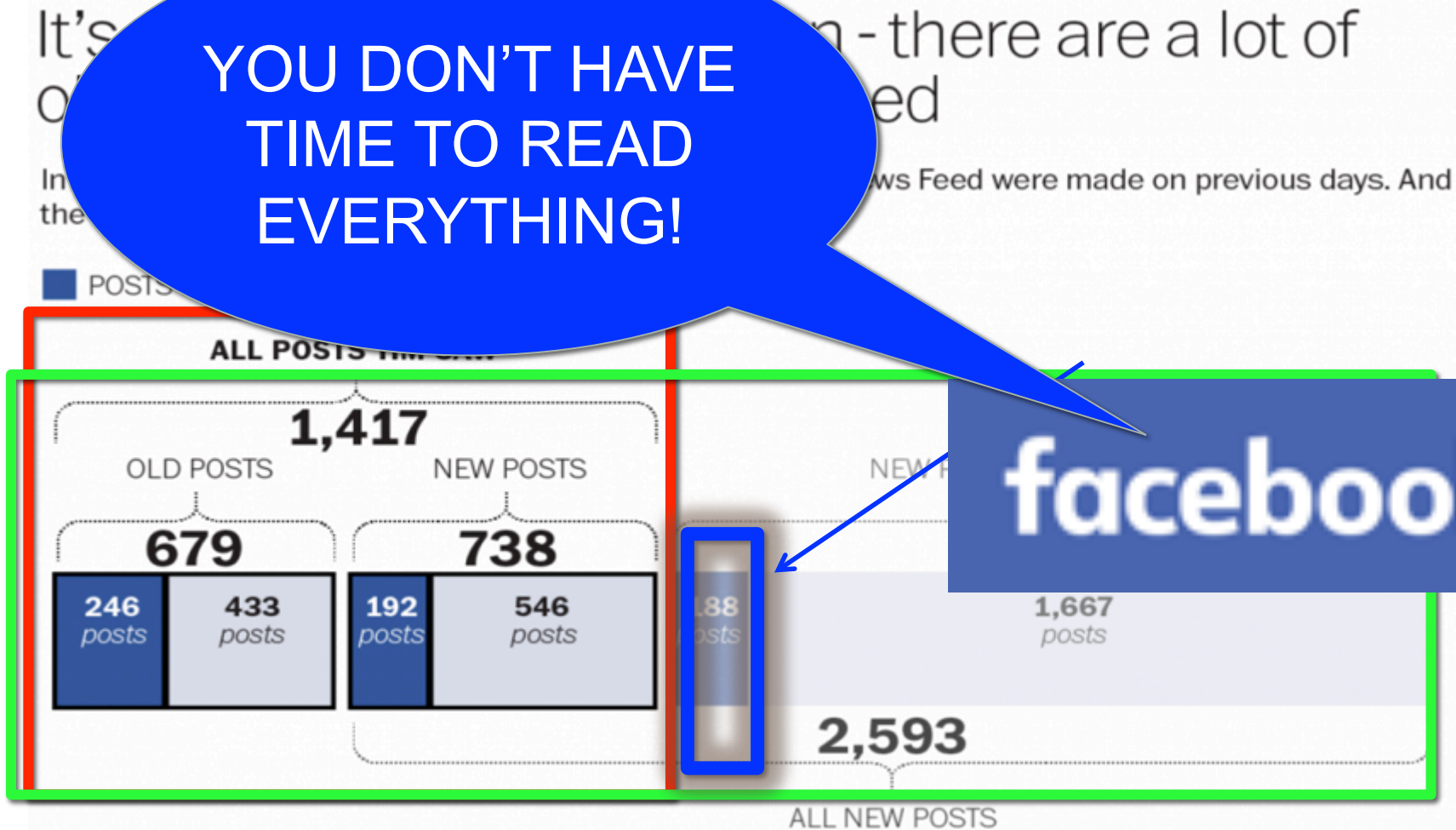


SO WHAT HAPPENED TO ALL THESE?



# Facebook Personalizing Algorithms

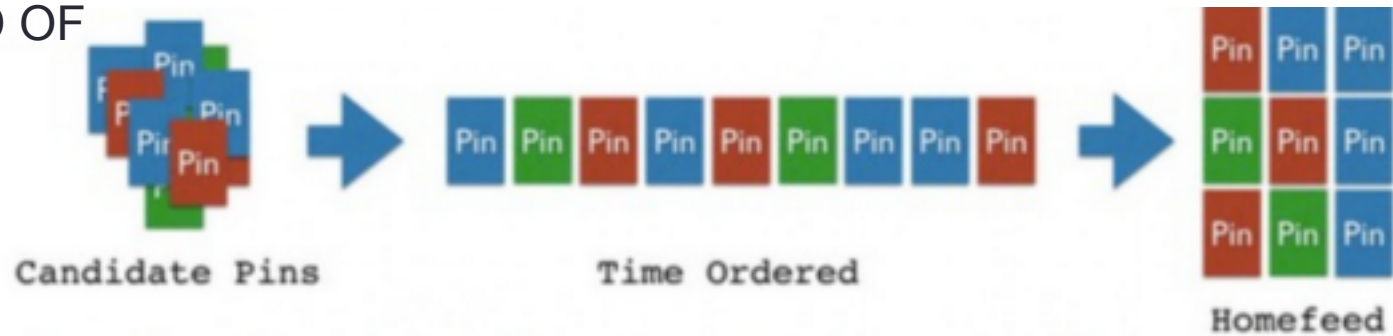
YOU DON'T HAVE  
TIME TO READ  
EVERYTHING!



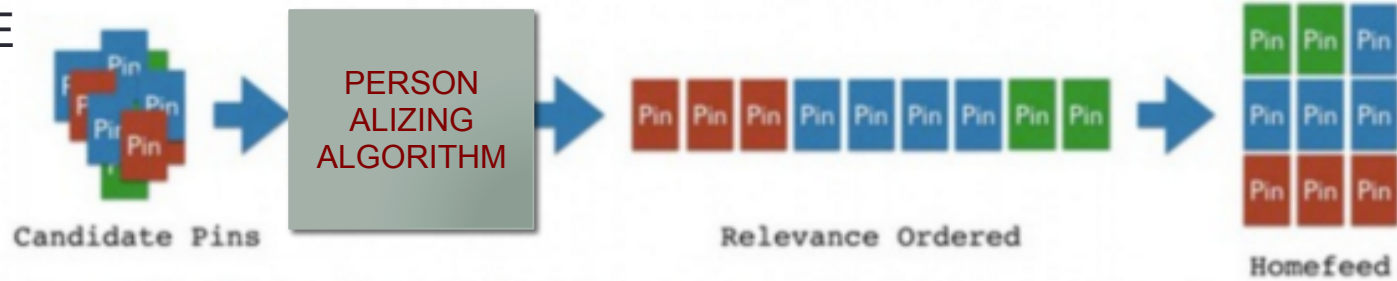
# Personalizing Algorithms

... In Summary

INSTEAD OF THIS:



WE SEE THIS:



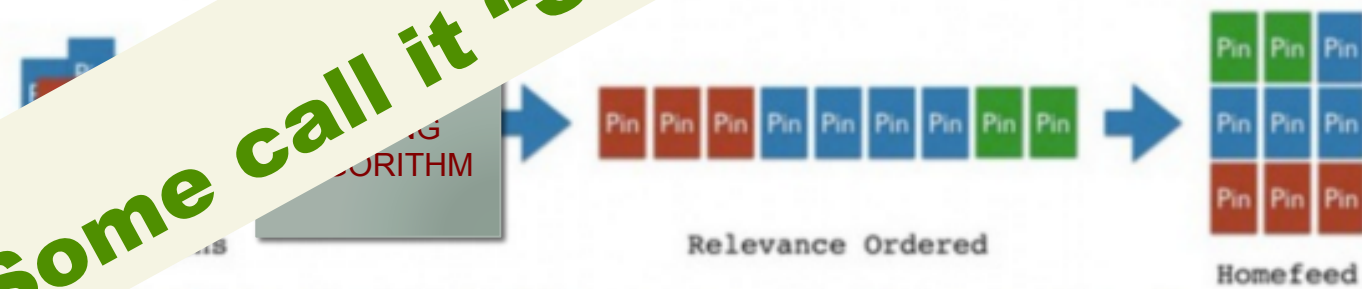
# Personalizing Algorithms

... In Summary

INSTEAD OF THIS:



WE SEE THIS:



**Some call it "Soft Censorship!"**

# Facebook's Emotional Manipulation Experiment!

- In 2013 Facebook in Conjunction with Cornell University ran an experiment:
  - Let's tweak the newsfeed algorithm for one week
  - 700,000 users were affected
  - Half observed more **positive** news, the rest observed more **negative** news

**The half that saw more positive news posted more positive messages!**

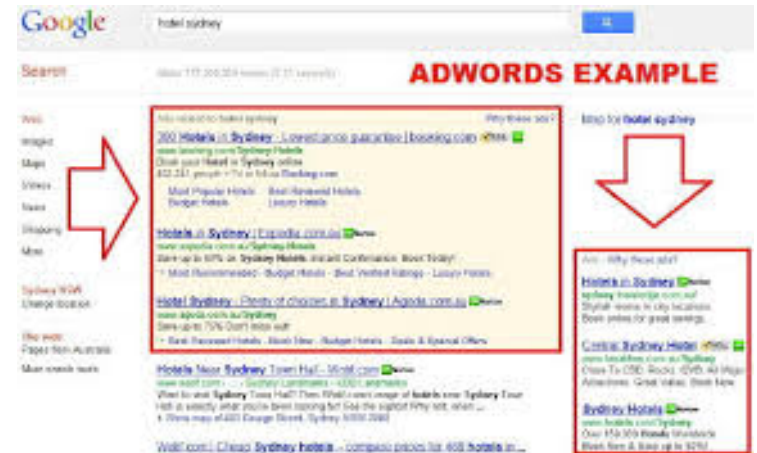
The Google logo is displayed in its characteristic multi-colored font: 'G' is blue, the first 'O' is red, the second 'O' is yellow, the first 'g' is blue, the 'l' is green, and the 'e' is red. The letters are 3D-rendered with a slight shadow.

Google

Don't be evil... (unless it's profitable)

# Google.....

- The only company's name that is associated with a **verb** (think?)
- The bulk of Google's revenue comes from its advertising service, **Google AdWord**



- Google processes over 40,000 search queries per second (3.5 billion/day)
- Every query has to travel on average 1,500 miles to a data center and back to return the answer to the user.

64.6% of people click on Google Ads when they are looking to buy an item online!

# Google's Search Algorithm

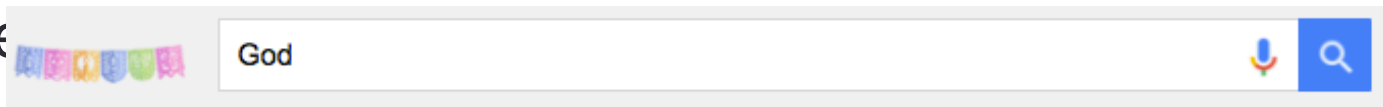
$$PR(p_i; t + 1) = \frac{1 - d}{N} + d \sum_{p_j \in M(p_i)} \frac{PR(p_j; t)}{L(p_j)}$$

- Sophisticated algorithm listing the search results for your query
- It is this algorithm that determines which listing make it to the top!
  - Originally called PageRank
  - New versions are Panda, Penguin, Hummingbird, and Pigeon
  - Pigeon considers over 200 ranking factor!
- Contrary to popular belief Google ranking is NOT based on **democratic process & popular rate!**
- Google search is certainly pragmatic & it works but it is far from being neutral and **does create some bias!**

Some Times Google Play it Safe.....

# Google Search – There are some exceptions...

- Sophisticated algorithm listing the search results for your query



- It is the

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- Co on
- Go fro

[Web](#) [Images](#) [News](#) [Videos](#) [Books](#) [More ▾](#) [Search tools](#)

About 1,570,000,000 results (0.33 seconds)

[God - Wikipedia, the free encyclopedia](#)

<https://en.wikipedia.org/wiki/God> ▾ Wikipedia ▾

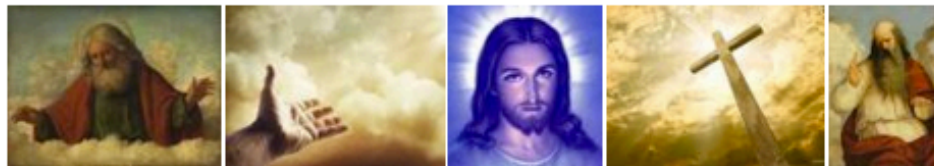
This article is about the concept "God" in the context of monotheism and henotheism.

For the general concept of "a god", see Deity. For God in specific religions, ...

[Henotheism](#) - [Existence of God](#) - [Quinque viae](#) - [God in Islam](#)

[Images for God](#)

[Report images](#)



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# NewsRank Decides

## ..... Which News to See!

- Google News algorithm is based on a long list of factors including freshness, quality, popularity, locality, and expertise of source
- Does Fox News have more expertise on health reform than DemocracyNow?
- Two boats carrying about 500 migrants sank after leaving Libya on 27 August – Did this make it to the leading item in Google News?



Can We Trust These Algorithms  
to Rule Our Digital World?

Why Should I Even Care?

# What is Wrong with Personalizing Everything?

- Personalized algorithms could **isolate** us from opposing views and new ideas
  - We can become **less tolerant!**
  - Some sociologists worry about a form of **Social Control**
- Personalized algorithms try to predict and show you the content you like
  - They operate based on what you tend to like
- Facebook and Google claim the personalization is for **our benefit** – They are mainly for **advertisers!**
  - **Corrupt Personalization** – personalization is really serving a corporation at our expense! - Christian Sandvig

# Algorithms Organize the Information



- In New York Time the gatekeeper is the Editor
- In Google the gatekeeper is PageRank/ NewsRank algorithms

# Can Algorithms be Racist or Sexist?

An Article by Victoria Turk – March 2015

- Algorithms are built by humans, and used by humans, and our biases rub off on the technology
- Algorithms are not always neutral & can discriminate!



# Can Algorithms be Racist or Sexist?

An Article by Victoria Turk – March 2015



- Algorithms are built by humans, and used by humans, and our
- Alg
- Co

UN Women - The Autocomplete Truth

UN Women Campaign:  
Gender Inequality in Google Autofill – 2013

women should|  
women should **stay at home**  
women should **be slaves**  
women should **be in the kitchen**  
women should **not speak in church**



# Final Remarks.....

- Technology certainly facilitates our lives but we should not be blind to it and just accept it!
  - Don't take it as granted!
  - We should educate ourselves
- The main purpose of any for-profit corporation is to serve its shareholder
  - Go beyond simple suggestions by Facebook
  - Read more than what Google suggests
- Logout when you do searching – be incognito!
  - Read about what you don't agree with!
- Learn to code!
  - Algorithms will rule the connected world!



# Final Remarks.....

Remember.....

**THINKING**



Googling

.....definitely from independent thinking



# References

- References are available here:  
[https://www.diigo.com/user/faridfarahmand/war\\_and\\_peace](https://www.diigo.com/user/faridfarahmand/war_and_peace)

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# Any Questions?

For more information contact:  
Dr. Farid Farahmand  
[farid.farahmand@sonoma.edu](mailto:farid.farahmand@sonoma.edu)