

CS 88S

# Safety in the Cloud

## An Introduction to Cybersecurity



# Agenda

- *Introductions*
- *Icebreaker Activity*
- *Administrative*
- *Myths & Realities*
- *Computers, Networks, Paradigms of Cybersecurity*

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# Who am I?

I'm Canadian! I love poutine.

4<sup>th</sup> year @ UCLA  
*Excited to graduate!*

Resident Assistant @ UCLA Residential Life



Computer Science B.S.

CS 136: Computer Security

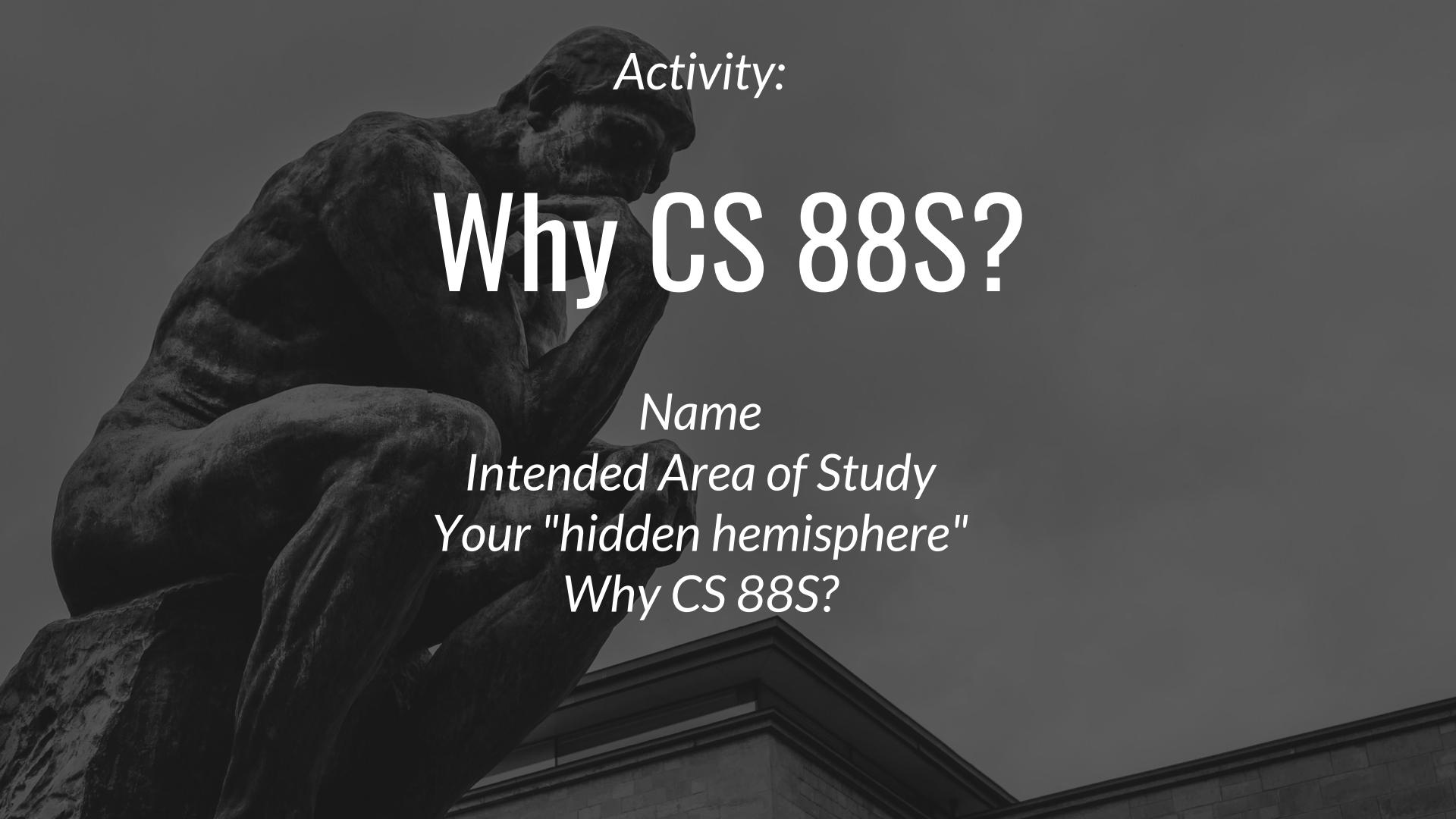
Incoming PM @ Microsoft  
Information Security

Frank Chen

**ASK ME ANYTHING,  
ANYTIME.**

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The background of the slide features a large, dark, textured rock formation or statue, possibly a bust, positioned on the left side. It has a rough, craggy texture and is set against a dark, almost black, background.

*Activity:*

# Why CS 88S?

*Name*

*Intended Area of Study*

*Your "hidden hemisphere"*

*Why CS 88S?*

Why

Why

Why

Why

Why

# The Five Why's

Why

Why

Why

Why

Why

# Why am I taking CS 88S?

Because I want to learn about **cybersecurity**.

Why

Why

Why

Why

Why

# Russian hacking warrants sanctions, cybersecurity CEO says

Anita Balakrishnan | @MsABalakrishnan

Tuesday, 27 Dec 2016 | 3:30 PM ET



CRUNCH NETWORK

## Will U.S. sanctions against Russia fix cybersecurity?

Posted Jan 9, 2017 by Nathaniel Gleicher



Because I want to earn it as

## INSIDE CYBER SECURITY AWARENESS WEEK

*At N.Y.U., high-school students work to solve a murder mystery involving a fictional Presidential race by analyzing digital "evidence" of security breaches.*



By Carrie Battan

## Giuliani as Trump's cybersecurity adviser is an unfunny joke

There's a new sheriff in hacker town, and nobody takes him seriously.



Violet Blue, @violetblue  
23h ago in Security

122  
Comments

2213  
Shares



Why

Why

Why

Why

Why

# Why do I want to learn about cybersecurity?

Because I want to **protect myself** on the Internet.

## 7 essential tips to beat phishing scams

*Don't get caught on the net*

+ Share

Phishing scams are among the most prevalent forms of **cybercrime**, especially in the UK. Although phishing is widespread, it is beatable. Apart from ensuring you install security software, the best way to combat scams is to learn what phishing looks like.

### What is Phishing?



**Phishing** (pronounced "fishing") is a kind of identity theft which is growing in popularity amongst hackers. By using fraudulent websites and false emails, perpetrators attempt to steal your personal data – most commonly passwords.

## Protect Yourself With a Free VPN Service

BY MAX EDDY NOVEMBER 29, 2016 10 COMMENTS

*Can't afford a premium VPN? That's no reason to leave your network traffic unprotected. Here's what you need to know about free VPN services.*

Protect yourself to protect my  
CNET > Security > Two-factor authentication: What you need to know (FAQ)

## Two-factor authentication: What you need to know (FAQ)

Twitter's got it. Apple's got it, too. Google, Microsoft, Facebook and Amazon have had it for a while. But why's two-factor authentication important, and will it keep you safe?

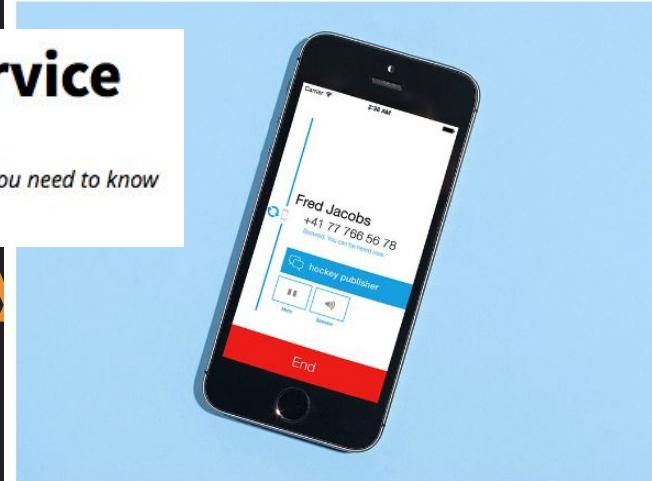
Why

Why

ANDY GREENBERG SECURITY 07.29.14 1:30 AM

## YOUR IPHONE CAN FINALLY MAKE FREE, ENCRYPTED CALLS

ab



The encrypted calling app Signal. The two seemingly random words beneath the contact's name are meant to be read out at the beginning of a conversation to make sure no man-in-the-middle snoop has eavesdropped on the call.

Why

Why

Why

Why

Why

Why do I want to protect myself on the Internet?

Because I don't want a malicious individual to **hack** me.

# The Internet of Hackable Things

Everything from smart fridges to connected Barbies to the Apple Watch found their way into American homes in 2015. That trend should continue in 2016 — something hackers will probably exploit, according to several experts.

"A new frontier of data breach issues is on the horizon," Lane Thames, a security researcher for Tripwire, told NBC News. "It is a result of the growing number of devices that belong to the Internet of Things, a.k.a. the IoT."

/hy

Why



business culture gadgets future startups

search

Cyber-Safe

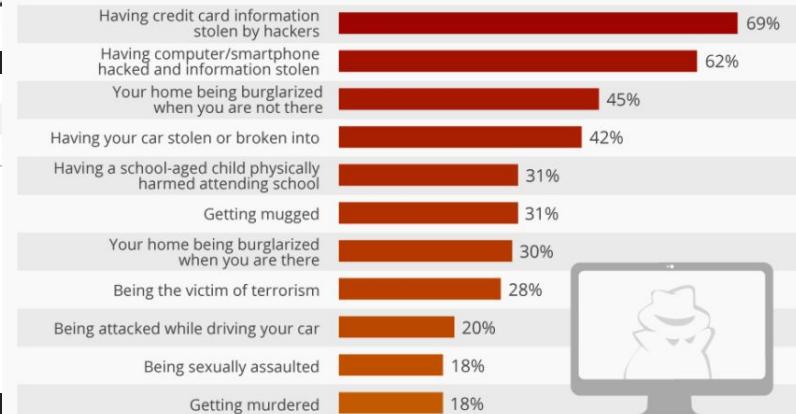
## Cybercrime costs the average U.S. firm million a year

by James Griffiths @CNNTech

## Los Angeles Valley College pays \$28,000 in bitcoin ransom to hackers

### Hacking Has Become Every American's Worst Nightmare

% of Americans who frequently or occasionally worry about the following



© StatistaCharts  
Source: Gallup

statista

Why

Why

Why

Why

Why

# Why don't I want to be hacked?

Because I have a lot of personal information online that should remain **private**.

# Evernote backtracks on controversial privacy policy

Users will now have opt in if they want engineers reading their notes to improve performance

by James Vincent | @jvincent | Dec 16, 2016, 3:30am EST

Why

Why

LAW & DISORDER —

## Police ask: “Alexa, did you w murder?”

Drowning in hot tub was followed by 140-gallon hose-down re

SEAN GALLAGHER - 12/28/2016, 12:45 PM

Because I have a lot of per  
*Breaking Down Apple’s iPhone Fight With the U.S.*

By THE NEW YORK TIMES UPDATED March 21, 2016

The technology company has been locked in a major legal battle against law enforcement officials over privacy and security.

ANDY GREENBERG SECURITY 09.22.16 12:15 PM

## HACK BRIEF: YAHOO BREACH HITS HALF A BILLION USERS



Why

Why

Why

Why

Why

# ISPs vs. Google/Amazon/Facebook

"Not only are users unable to control what traffic the ISP sees, but frequently they have no alternative; no **Protonmail**, no **DuckDuckGo**, no **Signal**. Much of the population gets to choose between two or three providers if they have any choice at all. This lack of choice puts **ISPs** in a different category from **edge providers**."

Why

Why

Why

Why

Why

# Why should my personal information remain private?

Because my personal information gives me access to my **money**, my **personal contacts**, my **identification**, and I don't want that to be taken advantage of.

# Cedars-Sinai says number of patient files in data breach much higher



## Ubiquiti Networks victim of \$39 million social engineering attack

### Amazon's customer service backdoor

As a security conscious user who follows the best practices like: using unique passwords, 2FA, only using a secure computer and being able to spot phishing attacks from a mile away, I would have thought my accounts and details would be pretty safe? Wrong.

hy

Why

A screenshot of a Gmail inbox. The subject line of the email is "plausible subject line" and it is in the "Inbox". The recipient field shows "to bcc: me". The email body contains the text "email signature". Below the message, there is a PDF attachment named "INVOICE-DEC287E.pdf" which is 100 KB. A red arrow points to the PDF file with the caption "not an attachment; an embedded image that links out to a fake 'sign in with Google' page". The email is posted by Tom Scott (@tomsco) with a "Follow" button. The post includes the text: "This is the closest I've ever come to falling for a Gmail phishing attack. If it hadn't been for my high-DPI screen making the image fuzzy...". The timestamp is 3:54 AM - 23 Dec 2016. The post has 6,440 likes and 5,530 comments.

# In Summary

cybersecurity

~ 2 weeks

protect myself

~ 4 weeks

hack

privacy

money, personal contact, identification

extra (ex. security in IoT devices)

~ 2 weeks

~ 2 weeks

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- *Introductions*
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- **Administrative**
- *Myths & Realities*
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# Course Website!

<http://kfrankc.me/cs88s>



# A Note on “Homework”

Grading Scheme → Grade

<10

Hours



“Being right keeps you in place.  
Being wrong forces you to explore.”

Steven Johnson  
*Where Good Ideas Come From*

**ASK ME ANYTHING,  
ANYTIME.**

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A dark, atmospheric illustration featuring a massive, multi-headed dragon breathing fire. In the foreground, a small, silhouetted figure stands facing the dragon, emphasizing the scale and power of the mythical creature.

# Myths vs. Reality

# Common Myths

- “No one cares about my computer.”
- “I have nothing worth stealing.”
- “Who would go through the effort of targeting me?”
- “It would be obvious if my computer was compromised.”

# The Reality

- “No one cares about my computer.”
- Attacks are easily automated
  - For example: Spam & Phishing

# The Reality

- “I have nothing worth stealing.”
- There are **billions** to be made off of insecure computers
  - Stolen money, but also: identities, accounts etc.

# The Reality

- Who would go through the effort of targeting me?"
- Many of you are valuable targets
  - Credit cards, shopping accounts, research lab data, corporate data etc.

# The Reality

- “It would be obvious if my computer was compromised.”
- When someone wants to take advantage of your information, they do NOT want you to discover them.

A side-profile photograph of a man with light brown hair, wearing a dark pinstripe suit jacket over a white shirt. He is seated in a chair, with his right hand resting against his chin and his head tilted slightly to the left, suggesting deep thought or contemplation. In front of him on a desk are several open books or papers.

“Nothing is more important  
to a democracy than a  
well-informed electorate.”

Will McAvoy  
*The Newsroom*

A photograph of a busy city street, likely in London, showing a large crowd of people walking. In the background, there's a building with a British flag flying from a pole, a Superdry storefront with a "OPEN" sign, and a Starbucks coffee shop. The scene is set during the day with sunlight filtering through the buildings.

Nothing is more important to the success  
of cybersecurity than a  
*cybersecurity-aware* population.

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ANYTIME.**

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# Computers

Computers deal with *data*.  
Computers are deterministic



# Internet



Internet brings **everyone** together.  
Internet is **nondeterministic**.

# The CIA Principle

C

Confidentiality

I

Integrity

A

Accessibility

# Confidentiality

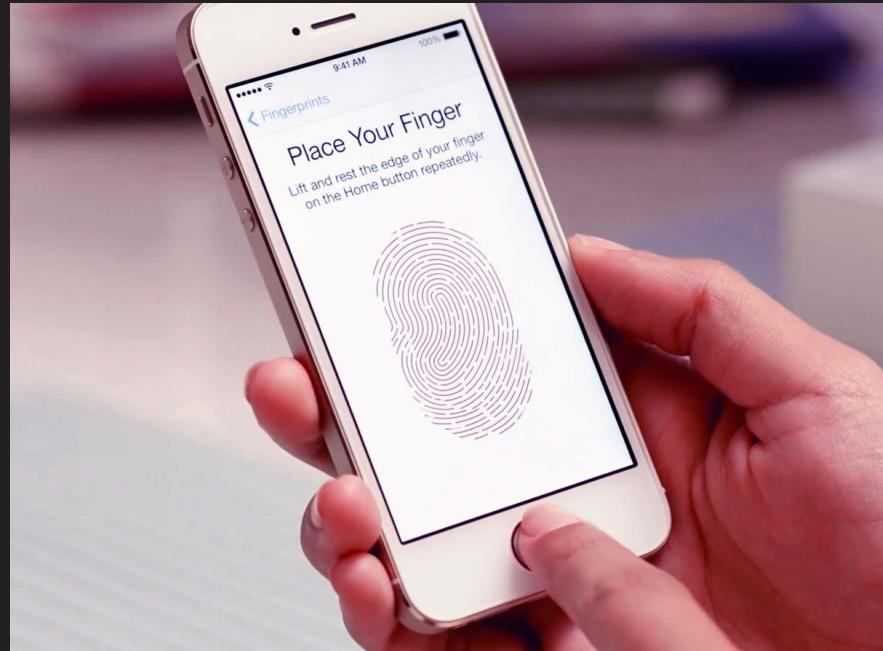
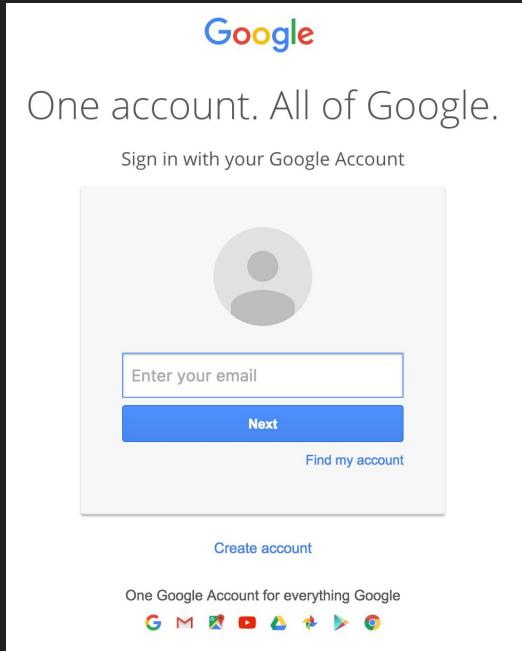
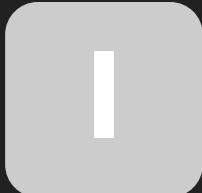
C

Def: ability to hide information from those people unauthorised to view it.

I

A

# Confidentiality



# Integrity

C

I

A

Def: ability to ensure that data is an accurate and unchanged representation of the original secure information.

# Integrity

C

I

A



# Accessibility

C

I

A

**Def:** ability to ensure that the information concerned is readily accessible to the authorised viewer at all times

# Accessibility

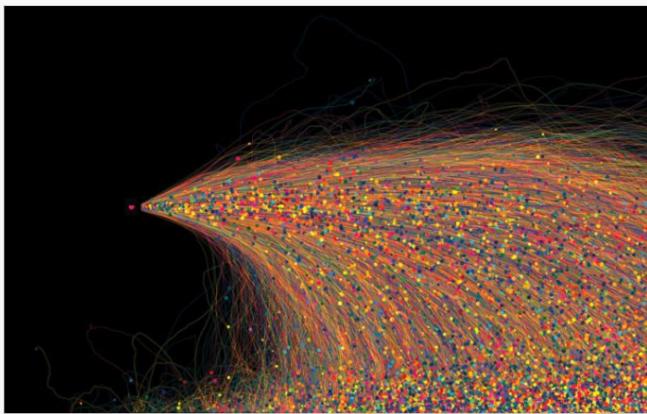
C

I

A

## Large DDoS attacks cause outages at Twitter, Spotify, and other sites

Posted Oct 21, 2016 by [Darrell Etherington \(@etherington\)](#), [Kate Conger \(@kateconger\)](#)



Several waves of major cyberattacks against an internet directory service knocked dozens of popular websites offline today, with outages continuing into the afternoon.

Twitter, SoundCloud, Spotify, Shopify, and other websites have been inaccessible to many users throughout the day. The outages are the result of several distributed denial of service

### Crunchbase

#### Twitter

FOUNDED  
2006

#### OVERVIEW

Twitter is a global social networking platform that allows its users to send and read 140-character messages known as "tweets". It enables registered users to read and post their tweets through the web, short message service (SMS), and mobile applications. As a global real-time communications platform, Twitter has more than 400 million monthly visitors and 255 million monthly active users around ...

LOCATION  
San Francisco, CA

CATEGORIES  
SMS, Blogging Platforms, Social Media, Messaging

WEBSITE  
<http://www.twitter.com/>

[Full profile for Twitter](#)

#### Spotify

Shopify

# In Summary

C

Confidentiality

I

Integrity

A

Accessibility



# *Safety in the Cloud Tip*

Always  
perform  
**system**  
update



*Mr. Robot*, an Emmy Award-winning  
TV drama starring a vigilante hacker

Next Week...