

Digital Distribution

CSE 120 Winter 2018

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How to Fake an Email From Almost Anyone in Under 5 Minutes

“I spend a lot of time explaining how easy it is to create fraudulent emails using an email address that doesn’t belong to you. A faked “from” address is, in fact, [how the majority of email attacks happen](#). And email attacks (aka phishing) are how the vast majority of cyberattacks begin. So the ease of faking emails from people is a major vulnerability.

“Here’s a message I sent to myself using President Trump’s address. Note that Gmail is a suspicious of the source—that’s why it put a little red question mark next to the address.”

- <https://hackernoon.com/how-to-fake-an-email-from-almost-anyone-in-under-5-minutes-12169dd44a92>



Administrivia

- ❖ Assignments:
 - Creativity Planning (1/30)
 - Reading Check 4 due *before lab* (2/1)
 - Creativity Assignment (2/2)

- ❖ “Big Idea” this week: Privacy

- ❖ Midterm in class on Monday (2/5)
 - 1 sheet of notes (2-sided, letter, handwritten)
 - Fill-in-the-blank(s), short answer questions
 - Questions will cover lectures, worksheets, assignments, and readings
 - Midterm Review packet on Exams page of website

Biggest Impact of Digitization?

- ❖ Digital information can be copied *instantaneously* and *without loss*
 - Analog copying: almost always with loss
 - Biological copying: mutations and recombination



Copying is Easy

- ❖ `myCopy = myData;`
- ❖ File: right-click → Copy

- ❖ Lossless, instantaneous copying leads to a wealth of societal issues:
 - Privacy issues ← Friday's lecture
 - Theft of private data
 - Interception of transmitted data
 - Persistence of digital data
 - Usage of digital works ← today's lecture
 - Copyright
 - Legal, cultural, and economic impacts

Discussion Prompts

- ❖ Do you think the following are “right”? Legal?
How have the rules changed in the digital vs. physical realm?

mp3	vs.	CD
mp4	vs.	VHS
eBook	vs.	book
- Theft: Taking something from someone else without permission *in digital theft, owner still has original!*
- Distributing a song that you purchased to your friends *what does “lending” mean in the digital realm?*
- Your friend sends you a photo; without asking, you send that photo to another friend *are works distributed on “social” sites/apps intended for further distribution?*
- Using an image you found on the Internet on your website (or as your profile picture)
- Using an artist’s song without permission in an audio remix or online dance performance video *Fair Use?*

Outline

- ❖ **Copyright**
- ❖ Sharing and open-source
- ❖ Creative Commons

Intellectual Property (IP)

- ❖ **Intellectual property** is something produced by one's intellect
 - ↑ can't just be an idea
 - e.g. artwork, books, photos, music, poetry, performances, software
- ❖ Distribution, copying, and sale of a work is the *right of the creator*
 - It is illegal! to copy someone else's creation for anything "other than personal use"
 - *You* are the creator of all that you create
 - Unless otherwise specified by a contract (e.g. at work)

Copyright: A Primer



- ❖ <http://www.youtube.com/watch?v=Uiq42O6rhW4>



Copyright Terminology Review

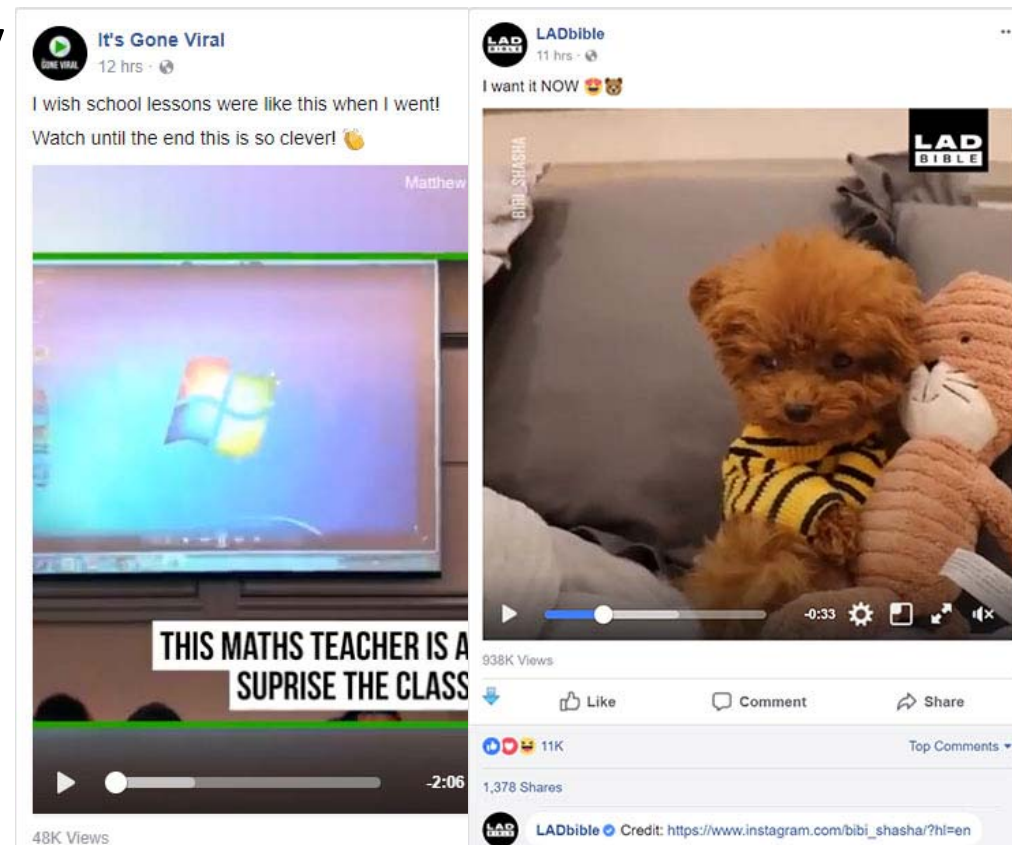
- ❖ **Copyright**: legal right granting creator of an original work *exclusive rights* over use and distribution
 - Set by laws of a country ← world wide web makes this legally tricky!
 - **Public domain**: exclusive IP rights expired, forfeited, or inapplicable
- ★ **Fair Use**: *right* to use copyrighted material without permission in specific circumstances
 - e.g. commentary, search engines, criticism, parody, news, scholarship
 - Judged based on (1) purpose/character of use, (2) nature of the work, (3) amount used, and (4) effect on work's value

Copyright Notes

- ❖ Applies to wide variety of works: articles, artwork, books, choreography, photos, podcasts, screenplays, *software*, songs
 - Does *not* apply to ideas, facts/data, or logos
- ❖ **Copyright is automatically applied**, even without the copyright symbol ©!
 - Once it is “captured in a fixed format”
- ❖ Copyright has a **limited duration**
 - Usually tied to life of creator → *expires X years after creator's death*
- ❖ **Attribution** is not a substitution for permission

Copyright Violations

- ❖ Why would people violate copyright?
 - Inadvertent – copying is too easy!
 - Inadvertent – unknown copyright status of material or misunderstanding of fair use
 - Financial – don't want to pay
 - Financial – making money through clicks, views, and advertising



Copyright Violations

- ❖ Most people who have posted on the Internet have probably violated copyright laws at one point
- ❖ Illegal sharing of music and videos
 - Napster, Kazaa, DC++, Bittorrent
- ❖ Illegal sharing of games
 - ISO images of games (to be played on emulators)
 - “Cracked” versions of games
- ❖ Illegal usage of photos and works
 - Misrepresentation, plagiarism

Digital Rights Management (DRM)

- ❖ Technologies that are used to restrict usage of proprietary hardware and copyrighted works
 - Not universally accepted or used; can be inconvenient
- ❖ Software: Product (serial) keys
 - Internal algorithm checks validity of entered key
 - “Cracked” keys can fool the validity check
- ❖ Audio: non-standard CDs or restricted usage of downloaded music
 - Only playable with certain devices or applications
- ❖ Games: Persistent online authentication

Digital Millennium Copyright Act (DMCA)

❖ Anti-circumvention provisions

- Illegal to attempt to circumvent DRM (even if copyright isn't breached)
- Often viewed as anti-tinkering → "I bought this so I should be allowed to take it apart"
- Proven to be rather toothless – circumvention still happens

❖ Safe harbor provisions

- Protect “providers of online services” (e.g. ISPs, Youtube, Facebook) from being sued for copyright infringements of its users
- DMCA Takedown Notice: copyright holders can request sites to remove or block access to material that violates their copyright

Most Effective Piracy Solution?

- ❖ Online Streaming!
 - Make it so convenient to stream content (video, music, games) that pirating seems unnecessary



Copyright and Laws

- ❖ Owners must “defend” their copyrights
 - RIAA and MPAA are at war with users
- ❖ Stop Online Piracy Act (SOPA) – 2011, never voted on
 - Would have allowed court orders to bar access to websites with copyright infringement to advertising networks, payment facilities, and Internet service providers
 - Service blackout in 2012 by Wikipedia, Google, and others in protest
- ❖ As of 2016, only 4 members of Congress (all in the House) have CS degrees

Outline

- ❖ Copyright
- ❖ **Sharing and open-source**
- ❖ Creative Commons

Copyright and Software

- ❖ Copyright applies to software *source code*
 - Software is often distributed in *executable* form so that the source code is not viewable
 - **Proprietary software** has IP rights restrictions – copyright of source code or patent rights
- ❖ Rapid growth – developers wanted to share ideas and build more complex software
 - Option 1: grant permission on a case-by-case basis
 - Option 2: put software in the public domain

↑ works derived from public domain
can be copyrighted, though



Copyleft

- ❖ Form of *licensing* that offers people the right to freely distribute copies and modified versions of a work with the stipulation that the same rights be preserved in derivative works down the line
 - <http://www.youtube.com/watch?v=u2k07BbPkDk>



Open-Source Licenses

- ❖ GNU General Public License (v2, v3)
 - ❖ Apache License
 - ❖ MIT License
 - ❖ BSD License
 - ❖ Public Domain
-
- These licenses differ in:
 - Attribution requirements
 - Commercial use restrictions
 - Derivative work restrictions

Why Open Source?

❖ Pros:

- Cheaper – free to install on all machines
- Crowd-sourced fixes and improvements
- Can persist beyond company that created it
- You can personally contribute and become part of the community

❖ Cons:

- Can be more difficult to use and support
- More potential security flaws

Open-Source Software

	Proprietary	Open-Source
Operating Systems	Windows, Mac OS	Linux, Android *
Web Browsers	IE/Edge, Safari	Chrome *, Firefox
Email Client	Outlook	Thunderbird
Music Player	Windows Media Player, iTunes	VLC
Audio Editing	Cubase, Logic Pro	Audacity
Image Editing	Photoshop	GIMP
Text Editor	Word, Notepad, Sublime Text	Notepad++, VS Code

* includes some proprietary software for accessing Google services

Outline

- ❖ Copyright and protection
- ❖ Sharing and open-source
- ❖ **Creative Commons**

Open Source for Non-Software?

- ❖ Copyright \approx *all* rights reserved
 - What if you don't want/need *all* rights?
- ❖ Use can use a **Creative Commons license**
 - Maintained by Creative Commons non-profit organization, founded in 2001
 - Specify what uses you want to allow *without needing permission*

Layers of Creative Commons Licenses



- ❖ Legal layer
 - Sustain lawsuits
- ❖ Human-readable
 - Understandable for 'everybody'
- ❖ Machine-readable
 - Understandable for search engines

Creative Commons Symbols

❖ Attribution (BY)

- Must give creator credit in derived/distributed works



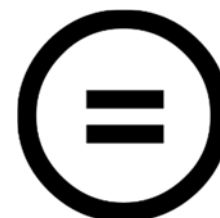
❖ Noncommercial (NC)

- Derived/distributed work can't be sold



❖ No Derivative Work (ND)

- Must use AS IS



❖ Share Alike (SA)

- Derivative works may be distributed *under the same license as this one*



Types of Creative Commons Licenses



↪ CSE120 material freely distributed online under this license

CC vs. Open Source

- ❖ Creative Commons Licenses are **not** recommended for program code
 - Use open-source licenses instead

- ❖ CC does *not* account for:
 - Patents
 - License compatibility
 - Binary vs. source code case distinction

Summary

- ❖ **Copyright** is intended to protect the rights to **intellectual property** by the owner
 - Often protected by Digital Rights Management software
 - Legal protections and implementations are still a “work in progress”
- ❖ **Open-source** licenses for software allow you to freely distribute your source code for use by others who agree to follow the same licensing rules
- ❖ For works that you would like to share, you can waive *some* of your rights using **Creative Commons** licenses