

INFO 350 – Mike Katell



Digital Rights and Discontents

INFO Policy, Law, and Ethics



Google blocks Huawei access to Android updates after blacklisting

Reported move could hit Huawei Technologies' ability to run phone operating system



US – China Trade War: Huawei

- Google has suspended Huawei's access to updates of its Android operating system and chipmakers have reportedly cut off supplies to the Chinese telecoms company, after the US government added it to a trade blacklist last week.
- Chipmakers such as Intel, Qualcomm, Xilinx, and Broadcom have told employees they will not supply chips to Huawei until further notice,

What's this about?

- Concerns have been raised about possible spying by Chinese government using exported technology
- “In particular, 5G equipment like that made by China’s Huawei, which can transfer data and voices at hyperspeed, can also serve as an espionage platform...”
- Also though...China banned products by Cisco and others over concerns about US spying post-Snowden



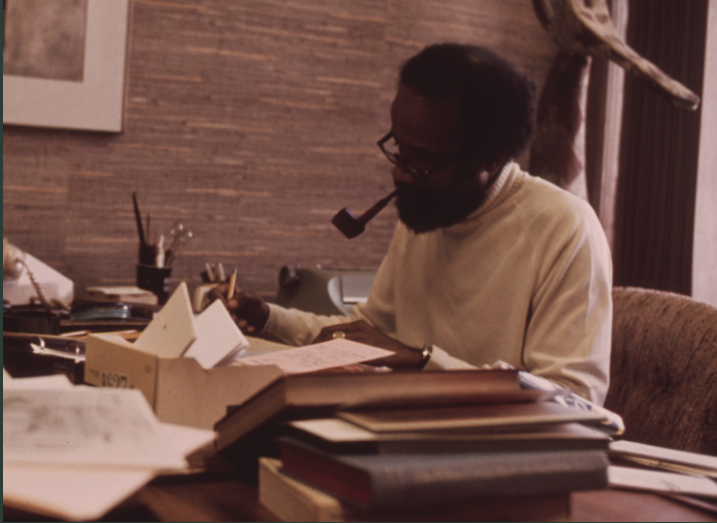
Digital Rights



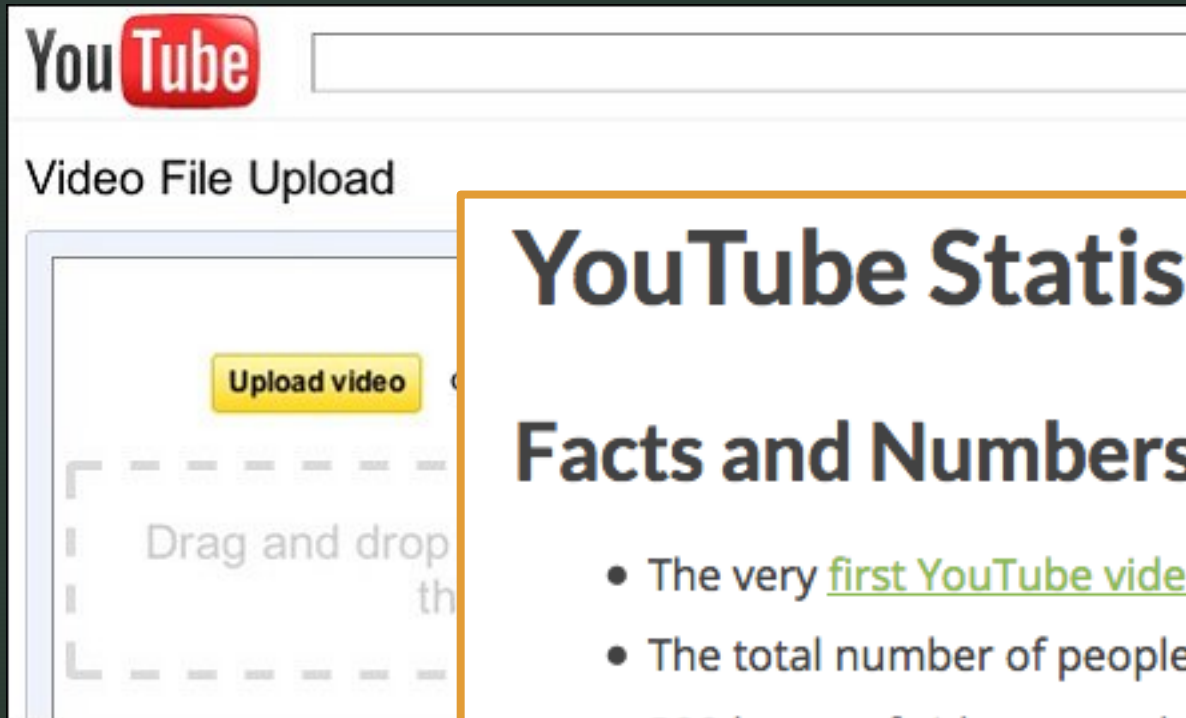
Corporations and Publishers



Creators & Artists



Digital Platforms



YouTube Statistics – 2017

Facts and Numbers

- The very first YouTube video was uploaded on 23 April 2005.
- The total number of people who use YouTube – 1,300,000,000.
- 300 hours of video are uploaded to YouTube every minute!
- Almost 5 billion videos are watched on Youtube every single day.
- YouTube gets over 30 million visitors per day

Digital Rights Management



Digital Rights Management

- "Digital Lock" – common metaphor
- Media (video, music, text) is either encrypted or "watermarked" by the publisher (copyright owner or her designated publisher)
- Device manufacturers are licensed by the publisher.
- Licensed devices come bundled with decryption keys or a validation algorithm
 - Copy protection (if you can't unscramble...)
 - Content validation (won't play if it's not a legal copy)



Digital Rights Management

- DVD and Blu-ray players
 - Including the ones built-in to Mac/Windows machines
- eBook readers - devices and apps (Kindle, etc.)
- Music services and stores (e.g. Spotify, iTunes)
- Cloud storage providers (OneDrive)



Digital Rights Management

Two Problems

1. Fair Use
2. Digital locks can be broken

DRM and Fair Use

17 USC § 107 – Fair Use

- Reproduction permitted for:
 - Criticism
 - Comment
 - News reporting
 - Teaching
 - Scholarship
 - Research
- (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.

DRM and Fair Use

- Felten: Fair use is a maddeningly vague standard. To computer scientists, “imprecision is a bug.”
- The standard was intended to be evaluated on a case by case basis. By a judge if necessary.
- "The vagueness of the fair use test makes it essentially impossible to create a DRM system that allows all fair uses...A DRM system that gets all fair use judgments right would in effect be a ‘judge on a chip’ predicting with high accuracy how a real judge would decide a lawsuit challenging a particular use. Clearly, this is infeasible with today's technology.”
- “Accurate, technological enforcement of the law of fair use is far beyond today's state of the art and may well remain so permanently.”

DRM and Fair Use

Formal Argument

- P1: Fair use allows for the limited reproduction of copyrighted materials for specific non-commercial purposes
- P2: It is ethical to reproduce copyrighted material if there is a high probability that the reproduction would fall under fair use
- P3: DRM technology is incapable of differentiating between legitimate and illegitimate copying. As such, it is configured to disallow ALL copying even if it might be allowed under fair use.
- P4: It is unethical to prevent legal reproduction for merely technical reasons when society might benefit from fair use-permitted reproduction
- C1: DRM's prevention of fair use reproduction is unethical

DRM and Fair Use

- This argument ONLY interrogates whether DRM is unethical in circumstances that involve Fair Use.
- It does not legitimize reproducing digital goods in general.
- Can you construct a formal argument that legitimizes reproducing digital goods? (file sharing, back up copies, other uses – your choice)



Digital Rights Management

Two Problems

1. Fair Use
2. Digital locks can be broken

DRM Fails

- DRM turned out to be not so hard to defeat.
- **Macrovision.** The original copy protection scheme was first deployed in 1984 on VHS tapes. Macrovision was however easily defeated when tinkerers figured out ways to filter out those extra signals
- **CSS.** The Content Scramble System was Hollywood's attempt to lock down the DVD format and prevent end users from ripping and copying DVDs. **It was cracked in 1999**, when a number of unknown hackers disassembled a software DVD player to extract its encryption key.

DRM Fails

- **SDMI.** The Secure Digital Music Initiative (1998). Backed by 200 music, technology and CE companies. Critics launched a contest in 2000 that asked security experts to “hack SDMI.”
- Princeton professor **Ed Felten** took the initiative by its word, and cracked all but one proposed watermarking schemes.
- The Recording Industry Association of America (RIAA) went on to threaten Felten with a lawsuit when he tried to document his findings, but subsequently backed down...

Digital Millennium Copyright Act

- Congress became convinced that the ability to create unlimited “perfect copies” of copyrighted works would limit the ability of copyright holders to profit from their works and would hence Digital locks proved to be less effective than hoped.
- Digital copying continued (continues)
- Stifles the production of creative works (sound familiar?)

DMCA

- The DMCA was passed by Congress in 1999 as an amendment to the US Copyright Act
 - Strengthens international copyright commitments
 - ...and prohibits the circumvention of copy protection and validation technologies (anti-circumvention),
 - ...and the distribution of tools to circumvent the technology (anti-trafficking)
- Circumvention/trafficking DRM **is a crime** whether or not it results in a violation of any other part of the Copyright Act

DMCA: Anti-Circumvention

- “No person shall circumvent a technological measure that effectively controls access to a work protected under this title.” (17 U.S.C. § 1201(a)(1)(A))
 - Definitions used in this section:
 - To circumvent a technical measure: “to descramble a scrambled work, to decrypt an encrypted work, or otherwise to avoid, bypass, remove, deactivate, or impair a technological measure, without the authority of the copyright owner.” (17 U.S.C. § 1201 (a)(3)(A))
 - Technical measure: “effectively controls access to a work’ if the measure, in the ordinary course of its operation, requires the application of information, or a process or a treatment, with the authority of the copyright owner, to gain access to the work.” (17 U.S.C. § 1201 (a)(3)(B))

DMCA: Anti-Trafficking

- “No person shall manufacture, import, offer to the public, provide, or otherwise traffic in any technology, product, service, device, component, or part thereof, that— (A) is primarily designed or produced for the purpose of *circumventing* a technological measure that effectively controls access to a work protected under this title;” (17 U.S.C. § 1201(a)(2))
- No person shall manufacture, import, offer to the public, provide, or otherwise traffic in any technology, product, service, device, component, or part thereof, that— (A) is primarily designed or produced for the purpose of *circumventing protection* afforded by a technological measure that effectively protects a right of a copyright owner under this title in a work or a portion thereof;” (17 U.S.C. § 1201(b)(1)(A))

DMCA - Benefits

- Modernizes copyright law to address novel challenges of digital media and digital publishing
- Maintains some of the preexisting publishing infrastructure (movie studios, recording industry, book publishing, et.c)
 - Preserves employment in these industries
 - Provides established routes for artists to get paid

DMCA – Complaints and Problems

- Abusive corporate practices
 - **Lexmark** has sued the makers of toner cartridges (twice) for figuring out how to get non-Lexmark branded cartridges to work in their DRM protected printers (they lost both times)
 - **John Deere** (tractors) has threatened farmers with lawsuits for attempting to repair their tractors (car manufacturers have done similar things)



DMCA – Complaints and Problems

- Potential Impact on Security Research
 - The Recording Industry Association of America (RIAA) threatened Felten with a lawsuit when he tried to document his SDMI copy protection findings...
 - Security researchers who have “reverse engineered” various systems have withdrawn papers from publication and canceled conferences over fears that their work would get them sued.

DMCA

[SECTIONS](#) [HOME](#) [SEARCH](#)

The New York Times

BUSINESS DAY

VW Is Said to Cheat on Diesel Emissions; U.S. to Order Big Recall

By CORAL DAVENPORT and JACK EWING SEPT. 18, 2015

[f](#) [t](#) [e](#)



RELATED COVERAGE



\$900 Million Penalty
Defect Leaves Many



Fiat Chrysler Recalls
Ram Pickups SEPT. 10,



Report Finds Vulnera
Lining U.S. Roads

DMCA: Does and Does *Not* Protect Artists

- The DMCA contains a “safe harbor” provision. Prevents online hosts (platforms, websites, etc.) from being held liable for “infringing content” posted by others. (Think YouTube.)
- However, in order to be immune from liability for the posting of copyrighted content, hosts must agree to take down whatever they are notified about (notice).
 - May be done through automation or by humans
 - Complaints – can include takedowns non-infringing content. Posters are not necessarily notified

DMCA: Notice and Takedown and Safe Harbor

- **17 USC § 512(c)**
- A service provider shall not be liable for monetary relief, or, except as provided in subsection (j), for injunctive or other equitable relief, for infringement of copyright by reason of the storage at the direction of a user of material that resides on a system or network controlled or operated by or for the service provider, if the service provider—
 - (i) does not have actual knowledge that the material or an activity using the material on the system or network is infringing;
 - (ii) in the absence of such actual knowledge, is not aware of facts or circumstances from which infringing activity is apparent; or
 - **(iii) upon obtaining such knowledge or awareness, acts expeditiously to remove, or disable access to, the material;**

Platforms Complain About the Challenge of Takedown While Profiting from Infringement

The image shows a YouTube video player interface. The main video is a performance by Prince, with a blue-tinted background. The video progress bar at the bottom shows 2:46 / 7:57. To the right of the video player, there is a search bar and navigation icons. Below the video player, there is a red dashed circle highlighting an advertisement for Grammarly. The ad includes the Grammarly logo, the text "Get Grammarly", an "Ad" label, the website "www.grammarly.com", and a blue button that says "IT'S FREE!". Below the ad, there is a section titled "Up next" with an "AUTOPLAY" toggle switch. The "Up next" section lists three videos: "Prince, Tom Petty, Steve Winwood, Jeff Lynne and others" (Rock & Roll Hall of Fame, 66M views, 6:16 duration), "Mix - Prince - Purple Rain (Official Video)" (50+ videos, YouTube), and "Top 10 Most Important Moments in Music History" (WatchMojo.com, 16M views, 14:45 duration).

YouTube

Search

Get Grammarly
Ad www.grammarly.com
IT'S FREE!

Up next AUTOPLAY

Prince, Tom Petty, Steve Winwood, Jeff Lynne and others
Rock & Roll Hall of Fame
66M views
6:16

Mix - Prince - Purple Rain (Official Video)
50+ (())
YouTube

Top 10 Most Important Moments in Music History
WatchMojo.com
16M views
14:45

Value Tensions

Competing Interests or Obligations





Burk & Gillespie

- Technological Determinism vs. Technological Neutrality
 - Is technology neutral?
 - Does technology ordain certain behaviors?

Burk & Gillespie

- Technological determinism – either utopian or dystopian
 - Technology can fix everything and is getting better all the time, the best technology rises to the top, technologies enter the world because they are needed and wanted, and we are usually better off
 - Technology is dark and dangerous. It changes how we live and destroys traditional values. It serves the needs of corporate overlords who manipulate us and convince us that we choose freely.


Burk & Gillespie


The politics of design:


- “who gets to design a technology and under what circumstances; why is a technology designed in a certain way; what do the designers hope to accomplish with it; and do users find that these design choices both facilitate and constrain their practices?”
- **Technology is “socio-technical.”**

Burk & Gillespie

- Does DRM have politics?
- DRM seeks to make certain options unavailable – to shape behavior in accordance with the law and other mandates
- *"Whereas legal prohibition leaves discretion over their behavior in the hands of the users, allowing them to determine whether to risk activity that might result in legal penalties, DRM forecloses such discretion...DRM works on the principle of preemption...prohibited uses are rendered impossible."* (p.241)

- 
- Technology is socially constructed....but constructed to have *consequences*...DRM does present specific problems:
 - DRM operates at the level of software. Its processes are opaque and hidden, which presents an obstacle to criticizing it.
 - Regulation is supposed to be an ongoing, deliberative, evolving process. DRM is an example of technology foreclosing that option.

- 
- Exceptions to law cannot exist if they cannot be adjudicated.
 - Example: **murder in self-defense**. If murder is technically impossible, that form of self-defense is not an option. Adjudication is impossible without the option for transgression.
 - DRM enacts law and prevents violating them.
 - Many laws have been tested in history by willful and common violation, which demonstrates the law's injustice or misalignment with societal values.



What is at stake?

- “Moral deskilling”
 - When people aren’t provided a choice in how to behave, they lose the ability to be good choosers.
- An alternate approach is to *guide* user behavior, not constrain it.
 - The feedback loops between implementation and use, revision and reuse, provide for better technologies, better regulations, better people.
 - Van den Berg & Keymolen: “Control v. Trust” article