Copyright, Code and Creativity
A Note of Caution About DRM in JPEG

Jeremy Malcolm
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Outline

Problems with DRM
  Technical and Security Problems
  Legal and Social Problems

Alternatives to DRM
  Technical and Security Alternatives
  Legal and Social Alternatives
Introduction

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• Most other objectives of the JPEG Privacy & Security activity can be achieved without resorting to DRM
Problems with DRM

Alternatives to DRM
Cryptographers Don’t Believe That DRM Works

“Digital files cannot be made uncopyable, any more than water can be made not wet.”
— Bruce Schneier

• To allow use of DRM-protected works requires distributing both the “lock” and the “key” to the user
• It only ever takes time for the key to be extracted!
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• At worst, the analog hole can always be used
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DRM Does Not Map Cleanly To Legal Rights

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- Even archives often (wrongly) claim copyright-like rights in public domain images
DRM Doesn’t Achieve Standardization Goals

DRM does not actually protect media, but it does:

• Restrict media from being used with free and open source tools.
• Make interoperability more difficult to engineer.
• Expose coders and researchers to additional legal risk.
• Extend a bad precedent for the extension of DRM to other forms of digital content.
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EME standardization at W3C

EME has not produced a reliable solution – it’s a support/implementation nightmare that members can’t make sense of.
DRM Reduces the Value of Content

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Exposure to Liability for Vulnerability Reporting

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- Especially worrying in JPEG world, since their images find their way into so many products and UIs

Public health and safety

If your pacemaker’s app uses JPEG icons, it could potentially criminalize vulnerability reporting
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- The end-result: long-lived critical vulnerabilities that are never reported for fear of prosecution
DRM Infringes Freedom of Expression

• *Felten, et al., v. RIAA, et al.*

  • The music industry used the Digital Millennium Copyright Act (DMCA) to threaten Princeton and Rice University Professors from discussing security flaws in its SDMI DRM technology.
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- Dmitry Sklyarov prosecution
  - A Russian programmer was charged with violating the DMCA for speaking at DEF CON about breaking e-book encryption (even though this was legal in Russia!)
DRM is Out of Step With Emerging Policy Norms

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The bottom line:
DRM is considered antithetical to the public interest
Problems with DRM

Alternatives to DRM
Cryptography

- Many use cases for JPEG Privacy & Security only require signing not encrypting metadata
  - Integrity of an original version of the image
  - Tracking of modifications
  - Integrity of the metadata (date, copyright)
- For encryption of the entire image file to prevent access, common container formats for this exist already
- For encryption of plain text metadata only, this can be done without locking the whole image
Rights Management Information

- Even without technical protection for metadata, the law already limits removal of rights information
  - InfoSoc Directive Article 7(1)(1), DMCA Section 1202
- This does not only apply to user-visible marks, therefore likely includes IPTC, Exif and XMP metadata
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  - Watermarking
  - Stegonography
Licensing

- Good (if unsurprising) news — licenses are enforceable
- All active Creative Commons image licenses include an Attribution condition
Recommendations.

1. Online platforms should be encouraged to preserve image metadata (the law may even require this)
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2. Those concerned with attribution should utilize an appropriate license that allows reuse with attribution
3. JPEG Privacy & Security group should work on extensions to allow signing of image metadata
4. JPEG Privacy & Security group should *not* create a DRM-protected image format that inhibits access
Summary

JPEG Privacy & Security has some worthwhile aims

• Validating (not preserving) image and metadata integrity
• Encrypting plain text metadata for protection of privacy

It also has some which are probably *not* achievable

• Protecting intellectual property rights
• Preserving the economic value of protected images

For those that are not achievable, alternatives exist

• Existing protection of copyright law and license terms
• For preventing copying, encrypt the image in a container
Questions?

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