#### Licenses; human subjects data Tools for Reproducible Research

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An often neglected aspect in discussions of reproducible research: software and data need to be licensed. If you want your software and data to be reused, you need to provide an explicit license that explains exactly how the software and data may be reused.

I'm going to try to explain the issues and give suggestions about licenses to consider. But I'm no expert, and I'm definitely not a lawyer. I don't guarantee that this is entirely correct.

If you will be sharing data on human subjects, or, for that matter, just working with data on human subjects, you need to be extra careful. I'll try to sketch the basic concerns.

I'm talking just about the United States here. I understand US law a bit, but I don't know the law in other countries much at all.

### Intellectual property

- Manuscripts/journal articles
- Books
- Software
- Data sets
- Ideas, inventions
- Lab/research notebooks
- Instructional materials
- Web sites

Intellectual property is property (ie, someone can own it) that is not an actual thing but more the idea of the thing. For example, it's not the actual physical book, but the text in the book. It's not an actual physical art work, but any depiction of the content of that artwork. This can get pretty complicated; it's best to move on. 3

Most of what academics produce is intellectual property.

#### **IP** protection

- Copyright
- Patents
- Trademarks, Trade "dress"
- Trade secrets

Different kinds of intellectual property are protected in different ways. I'm going to focus on copyright.

An important point to mention here is that an idea, fact or algorithm can't be copyrighted. Ideas and algorithms can be protected with a patent, but facts (including individual data points) can be neither copyrighted nor patented.

So, for example, copyright protection says that you may not be able to copy and use someone's exact code, but you can grab all of the ideas and re-implement them in your own way. Unless the ideas or algorithms are patented, and then you have to get their permission to use them, even if it's your own implementation.

#### Copyright

- Copyright is automatic
- ► In "works for hire," the employer holds the copyright
- In academics, it is customary that researchers control copyright
- ► At UW-Madison:

"Except as required by funding agreements or other university policies, the university does not claim ownership rights in the intellectual property generated during research by its faculty, staff, or students."

Since 1978, works you create are automatically copyrighted. That includes data, software, papers, books, talks, posters, course syllabi, and lecture notes. Since 1989, you don't need to include a copyright notice.

In many job situations, your employer will own the copyright on works that you create as part of your employment. But in academic settings, it is traditional that researchers retain copyright on the works they create. But there are exceptions, and universities are increasingly interested in generating income from the intellectual property of their faculty.

Also, students may be treated somewhat differently from other employees. Academic staff may be treated differently from faculty, for that matter. Ideally, the exact rules are written down somewhere. Find the rules and read them, and ask questions about them.

At UW-Madison, faculty, staff, and students own the intellectual property of the works they produce except in some special cases, such as instructional materials produced with significant university resources. And if you're going to patent something, it must be through the Wisconsin Alumni Research Foundation (WARF).

#### Exclusive rights under copyright

- ► To make copies of the work
- To distribute/sell copies of the work
- To create derivative works
- ► To perform the work
- ► To display the work publicly

Copyright protection gives the author exclusive rights to the work and to derivatives of the work.

Thus, the default is that no one can copy, modify, or redistribute your code.

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Breaking copyright	$\longleftrightarrow$	plagiarism
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These are totally different things.

Just in case it's not clear: the tradition of citing one's sources is really totally different from following copyright law.

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Works in the public domain should still be appropriately cited.

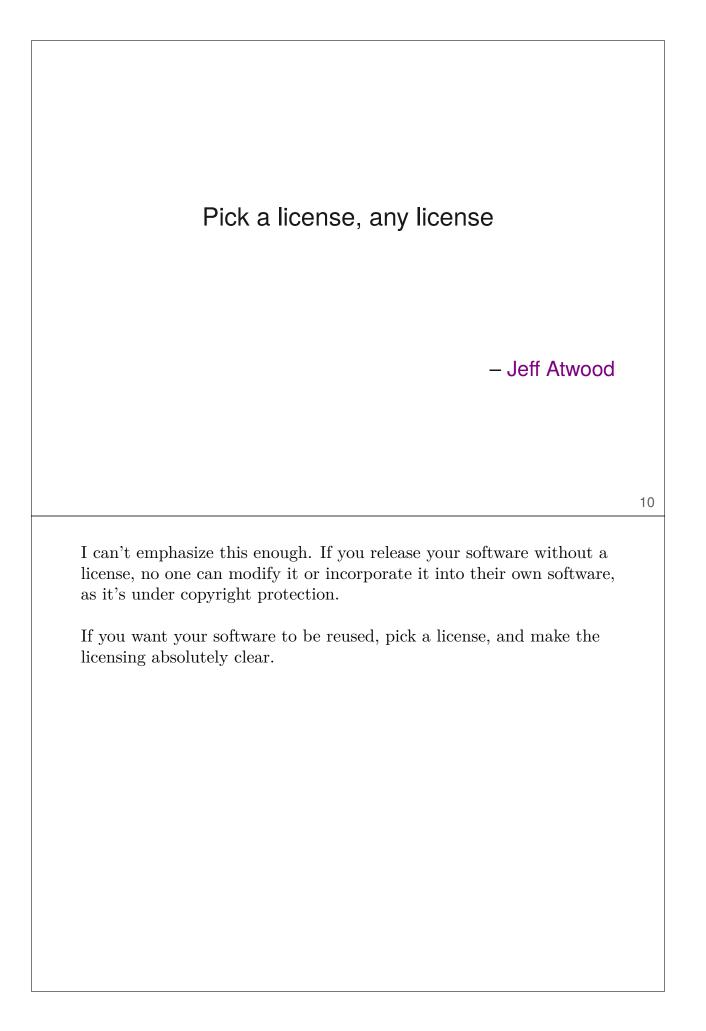
#### Software licenses

- Critical if you want your code to be reused.
- Also important to protect yourself from lawsuits.
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If you don't indicate a license for your software, others can't reuse it. You need to be explicit about whether and how your software may be reused, by providing a license.

I choose between the MIT license and the GNU General Public License (GPL). The MIT license is as open as possible: do whatever you want, just don't sue me. The GPL is "viral" (they say "copyleft") in that extends to derivative works: software that incorporates code under the GPL must also be under the GPL.

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#### **MIT** license

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The MIT license basically says: do whatever you want with the software, but be sure to include this notice, and don't sue me.

Those are the key things you want: protect yourself from liability, and make plain that people can be free to reuse the software.

#### GPL-3

- ► Use, modify, distribute, ...
- Don't hold the author liable.
- Distributions must include the source code.
- Software incorporating the work must also be under GPL-3.

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There is an older GPL-2. Use the GPL-3. It was updated to close some loopholes.

Key additions vs MIT license: distributions of the work or derivatives must include source code, and derivatives must also be licensed under GPL-3.

#### For GPL-3, include this

<line with the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

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To license your software under the GPL, include a notice like this.

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The Creative Commons licenses are really useful for things like manuscripts, data files, videos, web sites, and such.

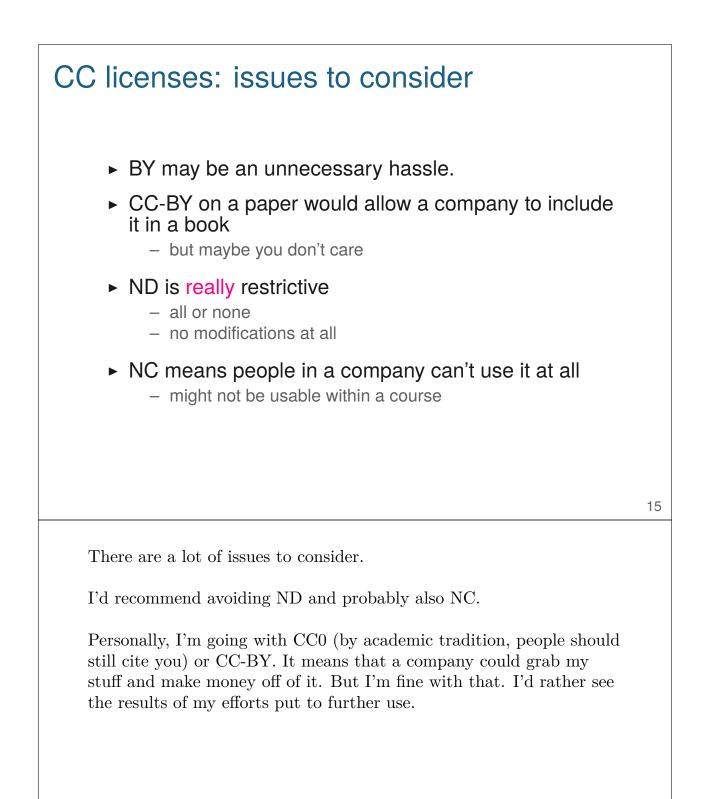
You shouldn't use them for software, as they can't be mixed with the GPL, and they make no explicit mention of source or object code. In the FAQ at Creative Commons, they explicitly recommend against the use of CC licenses for software.

BY means people must cite you as the originator.

SA means that derivative works must be distributed under the same license.

ND means the work must be distributed in its entirety, without any changes.

NC means the work can't be used in a commercial setting.



## Data copyright Individual data points are generally considered facts - Can't be copyrighted Compilations of data can be copyrighted - Involves some creativity, so an "original work of authorship" But someone can just extract and reformat the data Can assign a license to the data files to prevent extraction and redistribution See bitlaw.com/copyright/database.html 16 Data are viewed as facts and so they can't be copyrighted. Your data file or database, though, can be copyrighted, if its compilation involves some creativity, and that would generally be true for scientific data files. So people can't redistribute your data files unless you say it's okay. But they may be able to extract and reformat the data and then distribute that. If you want to prevent extraction and redistribution, the data files

If you want to prevent extraction and redistribution, the data files need a license, which would say the end user is prohibited from extracting data for uses other than intended.

#### Keep data open

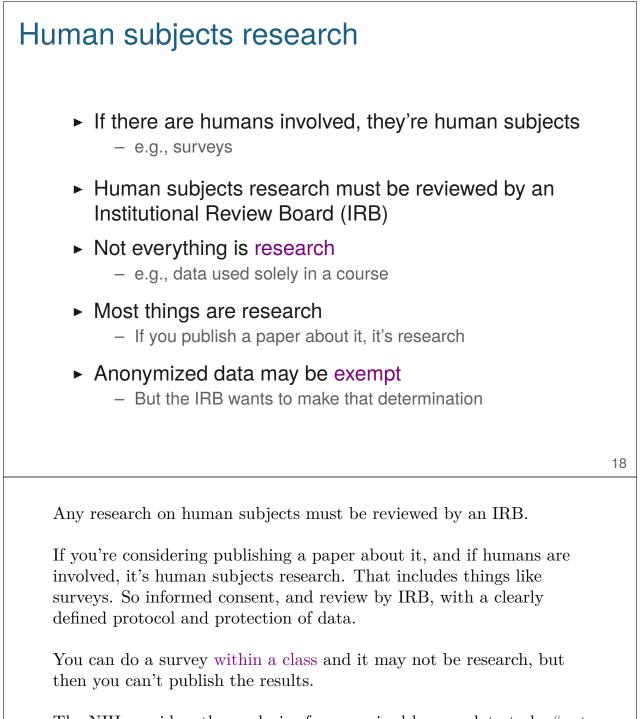
- Cite the source; cite the relevant papers
- ► Talk to the originator of the data
  - Even if redistribution is legal, don't piss them off.
- ► For your own data, use CC0 (public domain)
- ► If you want more control, talk to a lawyer

Statisticians, in particular, should want data to be openly available. And so you should cite the source of data and any relevant papers, not just because that's the academic tradition, but also because we want to reward, as much as possible, people who make data accessible.

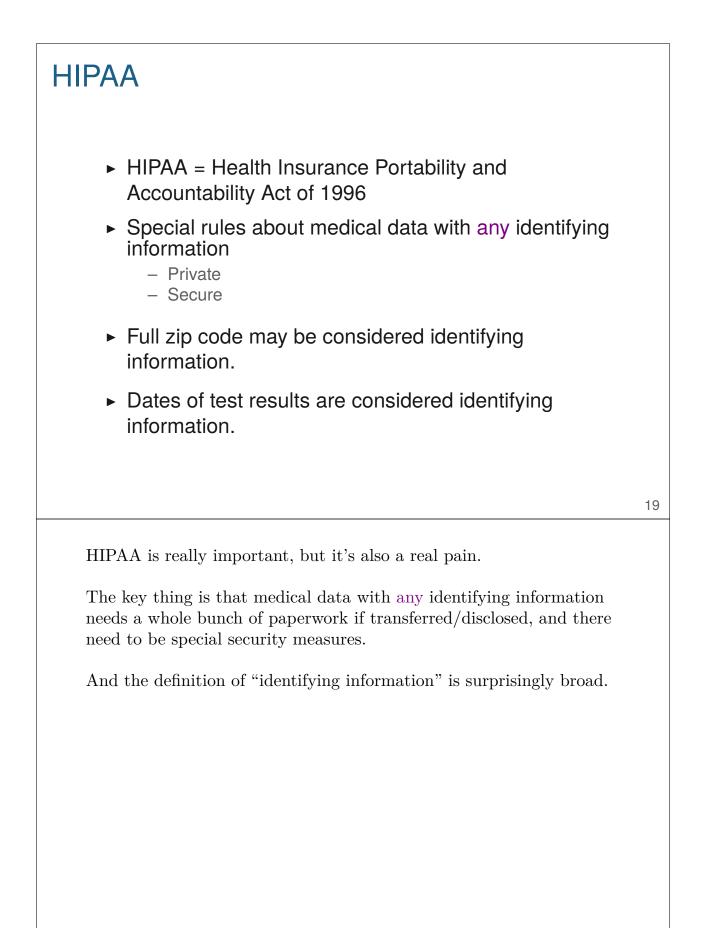
Even if it's perfectly legal for you to re-distribute data, you should talk to the originator of the data before doing so. You don't want them to get annoyed and then stop distributing data in the future.

If you want data to be reused, just put it in the public domain. Don't add any extra complexities, like CC-BY.

If you want to control reuse or redistribution, talk to a lawyer. It seems really complicated.



The NIH considers the analysis of anonymized human data to be "not human subjects research," and it may be exempt from full IRB review, but IRBs generally want to make such determinations themselves: you need to fill out some amount of paperwork.



#### Summary

- ► Pick a license, any license
- ► Use MIT or GPL for software
- Use CC0 for data
- Cite sources of software and data
- Talk to the source of data
- Be careful with human data
  - If you're unsure, ask for help

If you don't license your software, it can't be modified or reused.

Make data open, and be sure to reward those who make data and software accessible.

Be careful with human data, particularly if there's anything remotely identifiable.