AI and Legal Aspects

Jacob Barhak

Sole Proprietor

Computational Disease Modeler

Software Developer

Austin Less Wrong

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https://www.clinicalunitmapping.com/show/AI_legal_Latest.pdf

Other Versions of This Talk

- GE Healthcare Paper Club 2024 Sep 2nd Haifa
  https://www.clinicalunitmapping.com/show/AI_legal_GE_Healthcare_2024_09_02.pdf
- AI Makerspace Community Session 2024 Aug 24th, Sep 4th Virtual
  https://www.clinicalunitmapping.com/show/AI_legal_AI_Makerspace_2024_08_27.pdf
- Anaconda, Virtual 2025 Jan 9th, 17th, https://www.clinicalunitmapping.com/show/AI_legal_Anaconda_2025_01_17.pdf
- Austin Python Meetup, Virtual, 2025 Mar 12th,
  https://www.clinicalunitmapping.com/show/AI_legal_AustinPython_2025_03_12.pdf
- Austin Less Wrong, 2025 May 10th, https://austinlesswrong.com/
  https://www.clinicalunitmapping.com/show/AI_legal_AustinLessWrong_2025_05_10.pdf

Conflict of Interest and Disclaimer

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- Financial relationships: Jacob Barhak declare(s) employment from MacroFab, United Solutions, B. Well Connected health, Pronto Telecommunications. The author had a contract with U.S. Bank / Apexon, MacroFab, United Solutions, and B. Well during the work. However, none of these companies had influence on the work reported here.
- Jacob Barhak declare(s) employment and Technical Support from Anaconda. The author contracted with Anaconda in the past and uses their free open source software tools. Also the Author received free support from Anaconda Holoviz team and Dask teams.
- Intellectual property info: Dr. Barhak has a patent US Patent 9,858,390 - Reference model for disease progression issued to Jacob Barhak, and a patent US patent Utility application #15466535 - Analysis and Verification of Models Derived from Clinical Trials Data Extracted from a Database.
- Other relationships: personal fees from United Solutions, personal fees from B. Well Connected health, personal fees and non-financial support from Anaconda.
- Also, from 2006-2012 Jacob Barhak was paid by the University of Michigan to develop software licensed under GPL license.
- However, despite all support, Dr. Barhak is solely responsible for contents of this publication.
- I am not a lawyer!

Why this Talk?

- I have experience with Open Source
- Words such as "open source" sound very good, yet many times misunderstood
- I have seen misuse or misunderstanding of those issues in the Open Source and AI communities
- I will try to highlight some issues and explain as much as I understand
- I am not a lawyer!

Common Mistakes

- Publicly available data can be used for my AI tool
- Non-commercial use is allowed for my AI
- Open source is free and non-commercial
- Open source is sustainable
- Open source owners are maintainers
- AI models are free to use
- Any open source can be used in my project

Negative Examples Related to AI

- Why Drake Had to Take Down His Song That Featured AI-Tupac Vocals https://time.com/6971720/drake-tupac-ai/
- Regarding the removed voices - Reddit https://www.reddit.com/r/Uberduck/comments/112f7ul/regarding_the_removed_voices/
- Call for actors to remove voice from AI Voice generator sites https://x.com/volobos/status/1624876742073790467?lang=en
- The Hollywood Strikes Stopped AI From Taking Your Job. But for How Long? Wired https://www.wired.com/story/hollywood-saved-your-job-from-ai-2023-will-it-last/
- New York Times copyright lawsuit against OpenAI https://theconversation.com/how-a-new-york-times-copyright-lawsuit-against-openai-could-potentially-transform-how-ai-and-copyright-work-221059
- Eight newspaper publishers sue Microsoft and OpenAI over copyright infringement https://www.cnbc.com/2024/04/30/eight-newspaper-publishers-sue-openai-over-copyright-infringement.html

Negative Examples Related to AI

- Google, OpenAI, and Microsoft pass responsibility to users for AI generated material
  https://www.businessinsider.com/google-openai-microsoft-users-responsible-ai-copyrighted-material-2023-11
- Open AI offers customers to pay their legal costs if facing copyright law suites
  https://www.businessinsider.com/openai-legal-fees-chatgpt-customers-copyright-suits-sam-altman-2023-11
- Judge dismisses lawsuit over GitHub Copilot AI coding assistant
  https://www.infoworld.com/article/2515112/judge-dismisses-lawsuit-over-github-copilot-ai-coding-assistant.html
- Delaware court finds fair use defense unsuccessful in AI training copyright motion
  https://ipkitten.blogspot.com/2025/02/delaware-court-finds-fair-use-defence.html
- Judge says Meta must defend claim it stripped copyright info from Llama's training fodder
  https://www.theregister.com/2025/03/11/meta_dmca_copyright_removal_case/

Is Scraping Data for AI Allowed?

- hiQ Labs v. LinkedIn Supreme Court case:
  - hiQ Labs used web scraping on LinkedIn web site
  - 9th circuit decided that hiQ Labs had the right to do web scraping
  - The supreme court vacated the decision
  - The case was returned to a lower court
  - 9th circuit affirmed its decision
  - In November 2022 the U.S. District Court for the Northern District of California ruled that hiQ had breached LinkedIn's User Agreement and a settlement agreement was reached between the two parties.
  - Details in: https://en.wikipedia.org/wiki/HiQ_Labs_v._LinkedIn
- Explanation (my own without going into details)
  - It may be OK to web scrape in public sites yet, be very careful and be mindful of limitations

How to Obtain Data for AI

- Proprietary data
- Is personally identifiable data allowed?
- Scraping
  - Is there robots.txt file?
  - Is Authentication involved?
  - Other issues: see a longer list in a scraping talk by Robert Zurga: https://docs.google.com/presentation/d/19LviqOMB3dj4LzOhccmXVLkYBqMrODtKB9YPncF4hlg/edit#slide=id.g118fcc4a02_0_39
- Even if we have access, are we allowed to use certain data?
- Is there Copyright?
- What is fair use? https://en.wikipedia.org/wiki/Fair_use
  - Fair use includes commentary, search engines, criticism, parody, news reporting, research, and scholarship
- Is there other intellectual property?

What is Intellectual Property

- Copyright
- Patents
- Trademarks
- Trade secrets

For an open comprehensive manual see:

- The Tango Terms By D. C. Toedt III
  https://toedtclassnotes.site44.com/Tango2020Fall.html
  Chapter 18 deals with Intellectual property

International and US Protection

- US Constitution
  https://constitution.congress.gov/browse/essay/artI-S8-C8-1/ALDE_00013060/
- U.S. Patent and Trademark Office (USPTO)
- U.S. Copyright Office

International protection

- Berne Convention for the Protection of Literary and Artistic Works
  https://www.wipo.int/treaties/en/ip/berne/
- Paris Convention for the Protection of Industrial Property
  https://www.wipo.int/treaties/en/ip/paris/
- World Intellectual Property Organization (WIPO)
  https://www.wipo.int/portal/en/index.html

Do Non-Humans Have IP Rights?

- When a monkey takes a selfie, does the photo have copyright?
- This was a famous legal dispute: https://en.wikipedia.org/wiki/Monkey_selfie_copyright_dispute
- A monkey is not a legal person - therefore they cannot claim copyright

Do Machines Have IP Rights

- AI is not a legal person as well - so does AI generated work has copyright?
- A good discussion by Johnathan Kilnger in Hebrew can be found: https://2jk.org/praxis/?p=6252
- There was an opinion listed at the web site of an Israeli department of Justice. https://www.gov.il/he/pages/machine-learning
  - According to this opinion, a work generated by a machine that infringes IP will have to be examined per case.
  - This is my own loose interpretation from the Hebrew text
  - However, this implies that infringement of others IP by an AI may be possible
  - This is not a law - its an opinion and only in Israel

Copyrightibility of Work Prepared by AI - USA

- Copyright and Artificial Intelligence - Copyrightability https://www.copyright.gov/ai/Copyright-and-Artificial-Intelligence-Part-2-Copyrightability-Report.pdf
  - Published 1/2025
  - Questions of copyrightability and AI can be resolved with existing law without need legislation.
  - The use of AI tools to assist human creativity does not affect copyright protection for the output.
  - Copyright protects the work created by a human author, even if the work also includes AI-generated material.
  - Copyright does not extend to purely AI-generated material, or material where there is insufficient human control over the expressive elements.
  - Whether human contributions to AI-generated outputs are sufficient to constitute authorship must be analyzed on a case-by-case basis.
  - Based on the functioning of current generally available technology, prompts do not alone provide sufficient control.
  - Human authors are entitled to copyright in their works of authorship that are perceptible in AI-generated outputs.
- A good summary: Copyright Office Publishes Report on Copyrightability of AI Works https://connectontech.bakermckenzie.com/copyright-office-publishes-report-on-copyrightability-of-ai-works/

Copyrightibility of Work Prepared by AI - around the world

- Korea
  - Only a natural person can become an author
  - Additional work like modification can be copyrightable in part
- Japan
  - Copyrightability of AI-generated content will be determined on a case-by-case basis according to 4 criteria
- China
  - An image using Stable Diffusion was protected under China's copyright law
  - The person who used AI to create the image was the author
  - In that case over 150 propmts were used to generate the image
- The European Union (majority agreement)
  - AI generated content may be eligible for copyright only if the human input in the creative process was significant
  - Only a natural person can be considered an author

Copyrightibility of Work Prepared by AI - around the world

- United Kingdom
  - computer generated work is assigned ot the person arranging the work
  - It elected to leave the current law in place but did not rule out future changes and started a process
- Hong Kong, India, New Zealand
  - unclear hwo they will proceed
- Canada
  - a 2021 review of the Copyright Act acknowledged a lack of clarity concerning the authorship of an AI-generated work
  - Recommended that legislation should provide greater clarity
  - consultation process underway
- Australia
  - concerns over the lack of clarity of copyright laws regarding the extent of copyright protection, if any, that is afforded to works created by humans with the assistance or augmentation of AI.

In Summary

Existing law seems adequate in most cases, yet there is ongoing work

Worldwide Government and AI

- Trump executive order on AI https://trumpwhitehouse.archives.gov/ai/executive-order-ai/
- Blueprint for an AI Bill of Rights https://www.whitehouse.gov/ostp/ai-bill-of-rights/
- US Presidential Executive Order https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-secure-and-trustworthy-artificial-intelligence/
- EU AI Act: first regulation on artificial intelligence https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence
- EU Data Act https://digital-strategy.ec.europa.eu/en/policies/data-act
- China AI Regulation Draft: https://www.china-briefing.com/news/china-releases-new-draft-regulations-on-generative-ai/
- Executive Order on Advancing US Leadership in AI Infrastructure https://www.whitehouse.gov/briefing-room/statements-releases/2025/01/13/fact-sheet-ensuring-u-s-security-and-economic-strength-in-the-age-of-artificial-intelligence/
- President Donald J. Trump Takes Action to Enhance America's AI Leadership https://www.whitehouse.gov/fact-sheets/2025/01/fact-sheet-president-donald-j-trump-takes-action-to-enhance-americas-ai-leadership/

Trump Executive Order on AI

- Published 2/2019
- Highlights are:
  - Doubling AI research investment
  - Established the first-ever national AI research institutes
  - Issued a plan for AI technical standards
  - Released the world's first AI regulatory guidance,
  - Forged new international AI alliances
  - Established guidance for Federal use of AI.
- More details in: https://trumpwhitehouse.archives.gov/ai/executive-order-ai/
- More orders by Trump: https://trumpwhitehouse.archives.gov/ai/

Blueprint for an AI Bill of Rights

- Published: 10/2022
- Chapters are:
  - Safe and Effective Systems
  - Algorithmic Discrimination Protections
  - Data Privacy
  - Notice and Explanation
  - Human Alternatives, Consideration, and Fallback
  - Applying the Blueprint for an AI Bill of Rights
- More details in: https://www.whitehouse.gov/ostp/ai-bill-of-rights/

US Presidential Executive Order

- Published: 10/2023
- The Chapters are:
  - New Standards for AI Safety and Security
  - Protecting Americans' Privacy
  - Advancing Equity and Civil Rights
  - Standing Up for Consumers, Patients, and Students
  - Supporting Workers
  - Promoting Innovation and Competition
  - Advancing American Leadership Abroad
  - Ensuring Responsible and Effective Government Use of AI
- More details in: https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-secure-and-trustworthy-artificial-intelligence/

EU AI Act: First Regulation on Artificial Intelligence

- Published: 6/2023
- Last updated: 6/2024
- Chapters are:
  - AI Act: different rules for different risk levels
  - Transparency requirements
  - Supporting innovation
  - Next steps
  - More on the EU's digital measures
- More details in: https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence

EU Data Act: Shaping Europe's Digital Future

- Published: 12/2023
- Some Highlights are:
  - Increasing legal certainty
  - Mitigating the abuse of contractual imbalances
  - Public sector can access and use data held by the private sector for some important use cases
  - A framework allowing customers to switch between different data service providers
  - Touches certain aspects of Database Directive
- More details in: https://eur-lex.europa.eu/eli/reg/2023/2854
- Shorter explanation in: https://digital-strategy.ec.europa.eu/en/policies/data-act

China AI Regulation Draft

- Published: 5/2024
  - Some Highlights are:
  - Training data security
  - Model security
  - Security measures
- More details in: https://www.china-briefing.com/news/china-releases-new-draft-regulations-on-generative-ai/

Biden Executive Order on Advancing US Leadership in AI Infrastructure

- Published: 1/2025
- Some Highlights are:
  - No restrictions apply to chip sales to 18 key allies and partners.
  - Chip orders up to roughly 1,700 advanced GPUs do not require a license and do not count against national chip caps.
  - Entities that meet high security and trust standards and are headquartered in close allies and partners can obtain highly trusted "Universal Verified End User" (UVEU) status.
  - Entities that meet the same security requirements and are headquartered in any destination that is not a country of concern can apply for "National Verified End User" status, enabling them to purchase computational power equivalent to up to 320,000 advanced GPUs over the next two years.
  - Non-VEU entities located outside of close allies can still purchase large amounts of computational power, up to the equivalent of 50,000 advanced GPUs per country.
  - Continuing to ensure that advanced semiconductors sold abroad are not used by countries of concern to train advanced AI systems
  - Restricting the transfer to non-trusted actors of the model weights for advanced closed-weight models.
  - Setting security standards to protect the weights of advanced closed-weight AI models,
- More details in: https://www.whitehouse.gov/briefing-room/presidential-actions/2025/01/14/executive-order-on-advancing-united-states-leadership-in-artificial-intelligence-infrastructure/
- Shorter explanation in: https://www.whitehouse.gov/briefing-room/statements-releases/2025/01/13/fact-sheet-ensuring-u-s-security-and-economic-strength-in-the-age-of-artificial-intelligence/

President Donald J. Trump Takes Action to Enhance America's AI Leadership

- Executive Order
- Published: Jan 2025
- REMOVING BARRIERS TO AMERICAN AI INNOVATION:
  - Revoke Joe Biden's dangerous Executive Order that hinders AI innovation
  - The Biden AI Executive Order established unnecessarily burdensome requirements
  - Calls for departments and agencies to revise/rescind Biden AI order
- ENHANCING AMERICA'S AI LEADERSHIP:
  - Establishes the commitment of the United States to sustain and enhance America's dominance in AI
  - American development of AI systems must be free from ideological bias or engineered social agendas.
- CONTINUING PRIORITIZATION OF AI:
  - Builds upon previous executive order in 2019 and executive action in 2020
- More details: https://www.whitehouse.gov/fact-sheets/2025/01/fact-sheet-president-donald-j-trump-takes-action-to-enhance-americas-ai-leadership/

Regulations within US States

- Multiple US states started regulating AI.
  - See a map in https://www.multistate.ai/artificial-intelligence-ai-legislation
  - In 2024 over 600 AI-related bills in most states. 99 enacted into law
  - In 2025 the map of states with legislation is fully lit...
- More specific details in:
  - A state-by-state guide to AI laws in the U.S. https://www.techtarget.com/searchenterpriseai/feature/A-state-by-state-guide-to-AI-laws-in-the-US
  - Arizona AI Policy Overview - https://www.multistate.ai/ai-policy-overview-arizona

Should we Expect More Regulation?

- On Jan 2025 Trump rescinds Biden's AI risk policies https://dig.watch/updates/trump-rescinds-bidens-ai-risk-policies
- On Feb 2025 US and UK refuse to sign Paris summit declaration on 'inclusive' AI https://www.theguardian.com/technology/2025/feb/11/us-uk-paris-ai-summit-artificial-intelligence-declaration
  - The statement was signed by 60 countries
  - UK spokesman:
    - Not enough clarity on global governance
    - National security concerns
  - U.S. vicepresident J.D. Vance:
    - His speech criticized over regulation
    - He wanted to foster the creation of AI technology

AI Race and Fairness

- OpenAI declares AI race “over” if training on copyrighted works isn’t fair use https://arstechnica.com/tech-policy/2025/03/openai-urges-trump-either-settle-ai-copyright-debate-or-lose-ai-race-to-china/
- Assuming we are very responsible and ethical
  - Our work slows down
  - We may not have access to important new training data
  - Our models may not be competitive compared to players that ignore the laws
- Overregulation may slow down progress while "wild west" with no laws is bad
- There is a balance that we are now trying to find

AI Models are Becoming Less Open

- AI models are becoming less open - examples include:
  - OpenAI
    - GPT2 was open: https://huggingface.co/openai-community/gpt2
    - Newer models by OpenAI are closed
  - OpenRAIL (Responsible AI Licenses) licensing puts some restrictions on usage: https://book.the-turing-way.org/reproducible-research/licensing/licensing-ml.html
  - LLama license is open with some restrictions https://ai.meta.com/llama/license/
    - Limitations on some harmful and restricted uses: https://ai.meta.com/llama/use-policy/
    - Cannot use llama to improve any other LLM
    - Limitations on volume once a model has over 700 million active users in one month

Explanations on Why AI Models are Becoming Less Open

- Possible reasons (reasonable assumptions)
  - Concern of misuse
  - Attempt to keep some level of ownership
- In other words (my own interpretation):
  - Even open does not mean complete freedom to do anything!
  - Intellectual Property and commercial value matters to model creators!

Examples of AI Used Positively Along with Legalities

- Grimes invites fans to make songs with an AI-generated version of her voice https://www.npr.org/2023/04/24/1171738670/grimes-ai-songs-voice
  - Sharing profits
  - Asks not to abuse
- Use AI to fight plagiarism
  - YouTube feature to remove copyrighted audio https://aibusiness.com/verticals/youtube-upgrades-ai-feature-to-help-creators-remove-copyrighted-audio
  - Bill Ackman explains why AI should be used to fight plagiarism https://x.com/BillAckman/status/1743792224020619450?lang=en
- Patient Safety and Artificial Intelligence: Opportunities and Challenges for Care Delivery. https://psnet.ahrq.gov/issue/patient-safety-and-artificial-intelligence-opportunities-and-challenges-care-delivery

What is Open Source?

- The definition of open source software seems to be in the eyes of the beholder
- Different organizations see things differently
- Common traits are (in my own words):
  - The code can be used and executed
  - The code can be transferred to others
  - The code can be modified
- However, a large majority of open source is based on Copyright Law
  - Meaning the majority of open source is based in a legal restriction
  - Exceptions of public domain will be discussed later

Some Difference Among Open Source Licenses

- There are many copyright based open source licenses.
- They have differences in what they support: https://en.wikipedia.org/wiki/Comparison_of_free_and_open-source_software_licenses
- Common licenses are listed from permissive to more restrictive:
  - MIT - permissive
  - BSD - permissive with multiple variations
  - Apache - permissive and addresses patents
  - GPL - copyleft and addresses patents
- Copyleft is a mechanism that forces passing the restrictions of the license beyond copies
- Code from different open source licenses may not be compatible for use

Creative Commons Zero - CC0 and Public Domain

- In 2010 Creative Commons released the CC0 license:
  - https://creativecommons.org/share-your-work/public-domain/cc0/
  - https://en.wikipedia.org/wiki/Creative_Commons_license
- The basic idea is “No Rights Reserved”
  - In lay terms it attempts to remove copyright and put the work in public domain
  - No copyleft or attribution needed
- The license is honest:
  - The license is aware of restrictions like patents and warns the creator before releasing the work
- At of 26-Feb-2023 there were 421 projects on PyPi with CC0 license: https://pypi.org/search/?c=License+%3A%3A+CC0+1.0+Universal+(CC0+1.0)+Public+Domain+Dedication

Recent Issues with Open Source and CC0

- The Journal of Open Source (JOSS) decided against including CC0 in its license sets
  - https://github.com/openjournals/joss/issues/889
- NumFocus has decided against adopting CC licenses in a confusing manner:
  - Discussion links:
    - https://groups.google.com/g/numfocus/c/2PoF-n2OT2Q/m/sG1ZR6AYCAAJ
    - https://groups.google.com/a/numfocus.org/g/licensing/c/naKouplSf5Q
    - https://groups.google.com/a/numfocus.org/g/licensing/c/lM0Kk7bWlUU
- Open Source Initiative (OSI) did not approve CC0:
  - https://opensource.org/faq/#cc-zero
- In 2022 Fedora Linux disallowed CC0 software since it patent rights are not granted by the license https://www.theregister.com/2022/07/25/fedora_sours_on_creative_commons/
- JOSS related to NumFocus which related to OSI - they followed OSI decision without investigating the issue seriously.
- Should there be an entity that defines what is open that confines other entities?

Open Source Control Issues

- Opens source code is mostly governed by Copyright law
- The original owner of the code has some control over the code and can release or deny the code under a different license
- Modified work therefore depends on agreement between contributors
- What happens in case of a disagreement?

Example #1: Over Interpretation

- In 2017 I asked the institution where the original MIST GPL code was developed to:
  - Release other code that started from some documentation examples used by MIST under a different license
    - There was no code overlap of the new code
- The request was denied
  - There was no good reason for denial since there was no code overlap or reuse of GPL code.
- I reached an agreement to use LGPL

Example #2: Abandoned Code

- In 2019 I found out that GPL code was abandoned
  - According to a 3rd party, the institution chose to use a different engine
  - In fact, abandonment may have happened long before:
    - to the best of my knowledge, the institution did not release an update for 7 years
  - I was the only maintainer for a many years
- In 2020 when started work on COVID-19:
  - I asked for ownership transfer
    - I was denied - One argument was "that is a large ask"
  - I asked for a different license like CC0
    - I was denied
- Therefore, one contributor for the code can:
  - Deny incentive from any other by abandoning code and not transferring ownership
  - This remove incentive to improve the code or even maintain it

Example #3: Restrictions

- Some software may need some regulation:
  - Examples include:
    - some biological modeling that can be potentially dangerous
    - security tools that can be used to break laws to compromise privacy
    - military applications that are regulated
- If released as open source, the code can be potentially misused
- An open source license may need restrictions to prevent misuse
- However, open source licenses typically discuss only permissive parts
  - This may mislead naive young developers

Some Say Patents are Evil. What is More Evil?

	Patents	GPL
Duration	Up to 20 years / ~ 1 generation	~70+ years / ~ lifetime
Restrictions	Per Country - Owner responsible to abide law	Copy Left / viral, Requires abiding to license - not necessarily local law
Maintenance	Fee at application, 3/7/11 years	None
Screening	Patent examiner scrutiny takes years	None
Ownership	Private, public upon expiration	Communal? Contributors?
Incentives	Owner can trade / sell license	Anyone can sell, yet sale looses value
Registration	Government / Archived	FSF / Distributed
Summary	Hard to get, private ownership and short term, provides incentives	Easy to get, communal ownership with long term restrictions, little incentive

Is This Why GPL is Used Less?

- GPL usage has dropped compared to other licenses:
  - https://opensource.com/article/17/2/decline-gpl
- Is the public becoming aware of the long term stagnation effects of GPL?
  - Software generation is shorter than human generation - More compatible with patent restriction time
  - Abandoned code cannot be re-purposed efficiently
- Getting communal support to change a license once released as GPL becomes difficult
  - All contributors to a version must agree?
  - The more contributors the harder it gets.
  - When in the last time you saw a parliament vote unanimously?

Recent Developments in Biological Modeling and CC0

- BioModels - a repository of many biological models recommends the CC0 license: https://www.ebi.ac.uk/licencing
- The a group of researchers who met at the viral pandemic working group published a paper discussing licenses has published a paper supporting CC0 as a solution.
  - Karr Jonathan, Malik-Sheriff Rahuman S., Osborne James, Gonzalez-Parra Gilberto, Forgoston Eric, Bowness Ruth, Liu Yaling, Thompson Robin, Garira Winston, Barhak Jacob, Rice John, Torres Marcella, Dobrovolny Hana M., Tang Tingting, Waites William, Glazier James A., Faeder James R., Kulesza Alexander. Model Integration in Computational Biology: The Role of Reproducibility, Credibility and Utility. Frontiers in Systems Biology, Vol 2. 2022. https://doi.org/10.3389/fsysb.2022.822606
  - Discussion 1: https://lists.simtk.org/pipermail/vp-integration-subgroup/2021-January/000022.html
  - Discussion 2: https://lists.simtk.org/pipermail/vp-integration-subgroup/2021-May/000210.html
- Important Reasoning:
  - CC0 allows combinations of models
  - Supports reproducibility, integration, traceability, transparency, and even commercialization if needed.

Another AI Winter May Come If We Do Not Behave

- AI winter was caused multiple times partially due to exaggeration and over-promising: https://en.wikipedia.org/wiki/AI_winter
- If we as a community misbehave we may trigger another AI winter
- Therefore it is important we maintain safe and ethical use of AI

Safe and Ethical Use

- Get approval from any source of data in writing
- Don't just scrape - read the fine print
- Contact the owners of trademarks
- Make sure you are not infringing patents
- Don't use data or code with unknown license
- Make sure your licenses don't conflict
  - Among themselves
  - With your goals or your organization goals
- When in doubt assume worse case and take action before things go wrong
- Do not do something you will not want to be done to you or your organization
- Think about the long term future
- Learn more about ethics and programming from "Uncle" Bob Martin - "The Future of Programming": https://youtu.be/ecIWPzGEbFc?si=WW7iVbiporpvTdqi

Thank You

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Feel free to contact:

Jacob Barhak

jacob.barhak@gmail.com

https://sites.google.com/view/jacob-barhak/home

Specifically for Disease Modeling

- I personally called for publishing modeling code openly in a large forum:
  - My calls were ignored and not documented
  - Different entities look at this topic differently
- A group of Scientists published a call for transparency:
  - https://doi.org/10.1126/science.abb8637
- I called for public discussion on ways to make it possible:
  - https://forum.comses.net/t/issues-with-regard-to-call-for-transparency-of-covid-19-models/8433
- One major argument was that government funded research should benefit the public

Should Government Fund Open Source?

- Here are some previous signs in that direction where government wants reuse of products:
- Fair Access to Science and Technology Research (FASTR) Act: https://www.cornyn.senate.gov/content/news/cornyn-wyden-introduce-bill-increase-access-taxpayer-funded-research
  - Focuses on publication
  - Recognizes patents and national security as exceptions
- Previous US administration policy: http://blogs.nature.com/news/2013/02/us-white-house-announces-open-access-policy.html
  - Focuses on mostly publication
- NIH Strategic Plan For Data Science https://datascience.nih.gov/sites/default/files/NIH_Strategic_Plan_for_Data_Science_Final_508.pdf
  - Mentions the word open over a dozen times with regards to data and software
  - However, to date NIH still allows funded bodies to retain ownership: https://grants.nih.gov/policy/intell-property.htm

Suggested Solution for Funding Bodies and Research

Entities that fund open source should embrace the following strategy:

- The definition of open source should include licenses like CC0
- Ask software products of research to be released as open source license for the duration of funding
- The work and license should include explicit restrictions
- When research/development is abandoned, code should be released to public domain
  - For example Creative Commons Zero
  - This will provide incentive for future development by private / public entities