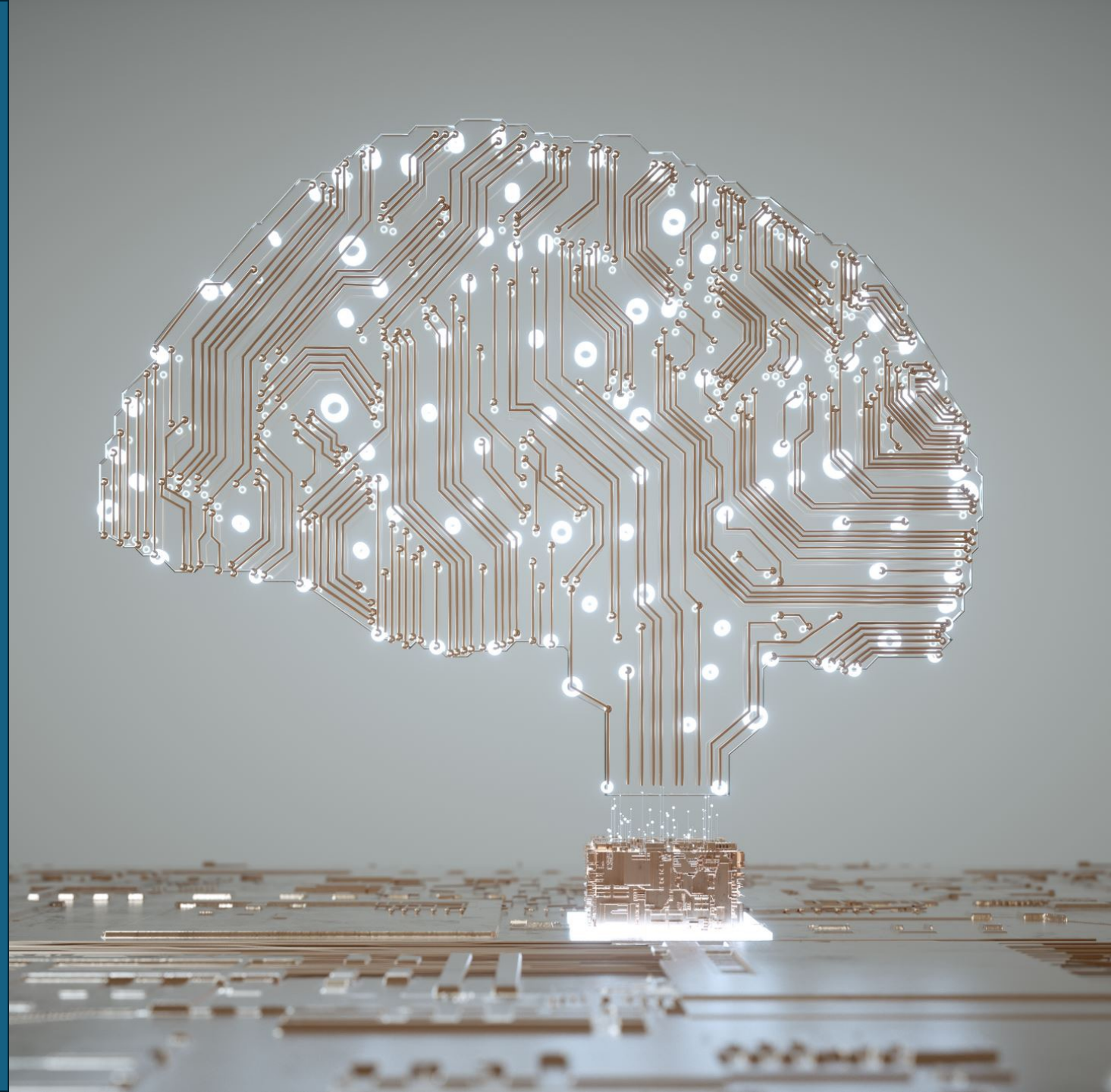# Intellectual Property & AI

## Lecture 1

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# Outline of Part 1 (IP Basics & Innovation)

- What is Intellectual property (IP)? What are primary types of IP?

- Whom do intellectual property (IP) regimes protect? Why are IP laws important?

- Are IP rights transferrable? What is the open-source approach to IP?

- How should IP systems adapt to technical change such as AI?

# What is Intellectual Property (IP)?

According to WIPO (World Intellectual Property Organization):

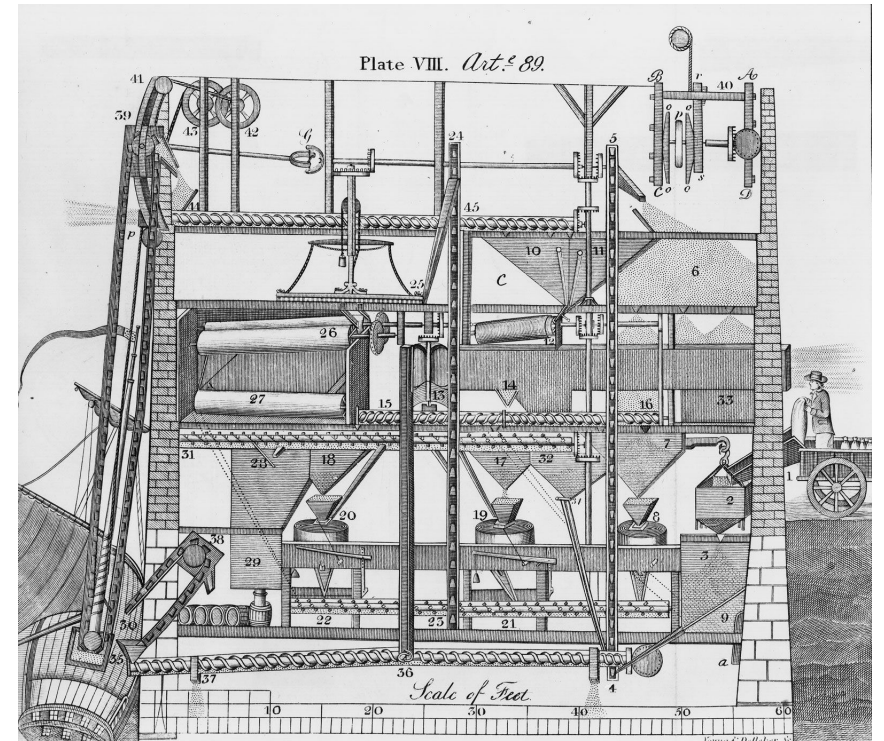- Creations of the "mind" *(Intellectual)*, such as

→ **Inventions**

patent

# Primary Types of Intellectual Property

- **Patent**: an exclusive right granted for *an invention*

- To obtain a patent, the invention

→ must be "novel"

→ must involve an inventive step

→ must be industrially applicable, i.e., solves a problem using technology



Automatic gristmill patent, 1790 (granted to Oliver Evans)

# What is Intellectual Property (IP)?

According to WIPO (World Intellectual Property Organization):

• Creations of the "mind" *(Intellectual)*, such as

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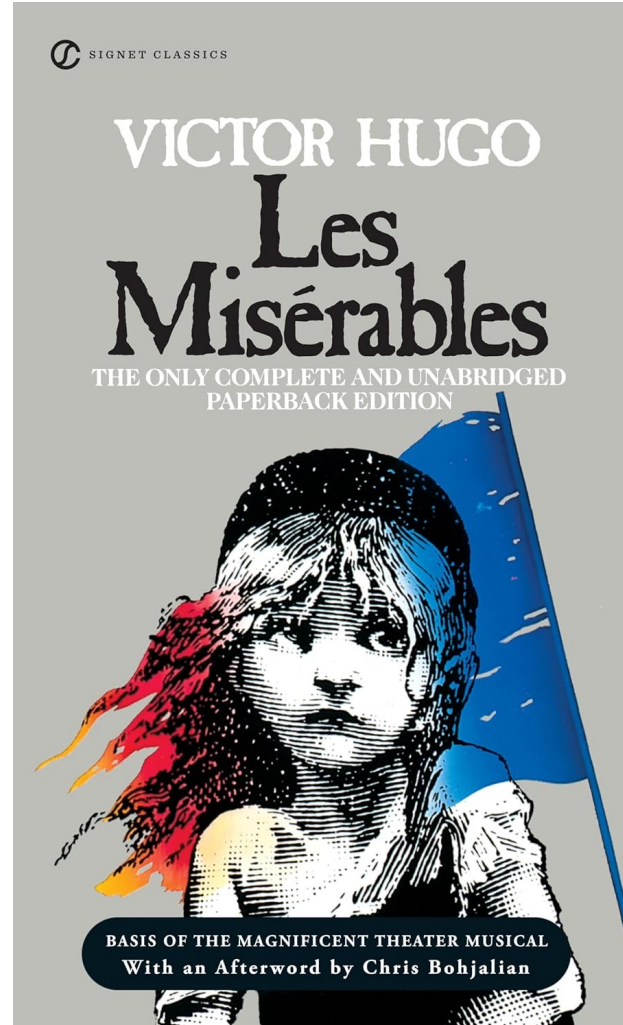**patent**

→ **Literary and artistic works, Designs**

**copyright**

# Primary Types of Intellectual Property

- **Copyright:** *author's* rights to their own created *original works*

- Requirements:
→ must be **original**
→ must have an **author** (e.g., not accidentally discovered)
→ minimum level of **creativity**
→ must be fixed in a **tangible medium** (e.g., on a computer screen)

# Copyright

- Covers literary and artistic works, and designs

- Protects "original works of authorship"



A literary work



The Storm on the Sea of Galilee, 1633 (Rembrandt van Rijn)

# How authors acquire and protect copyright

- Copyright is ***automatically*** acquired; author does not need to do anything to obtain copyright

- May need to register with Registrar of Copyrights (in the US) to sue others for infringing on your copyright

# What is Intellectual Property (IP)?

According to WIPO (World Intellectual Property Organization):

• Creations of the "mind" *(Intellectual)*, such as

→ Inventions      **patent**

→ Literary and artistic works, Designs      **copyright**

→ **Symbols, names and images used in commerce**      **trademark**

# Primary Types of Intellectual Property

- **Trademarks:** *distinctive* "marks" (e.g., word, phrase, logo) used by producers to distinguish their goods from those produced by other firms

- Legal standard

→ must be ***distinctive*** (i.e., generate a unique association between the mark and the underlying company)

→ must be in ***commercial use***

# Primary Types of Intellectual Property

- **Trademarks:** *distinctive* "marks" (e.g., word, phrase, logo) used by producers to distinguish their goods from those produced by other firms

- Who owns the trademark?
  - In the U.S., first one that uses it commercially; in Europe: needs to be registered and whoever files the registration first

# What is Intellectual Property (IP)?

According to WIPO (World Intellectual Property Organization):

• Creations of the "mind" *(Intellectual)*, such as

→ Inventions

**patent**

→ Literary and artistic works, Designs

**copyright**

→ Symbols, names and images used in commerce

**trademark**

**Intangible assets *(Property)*, whose owners are granted certain rights and protection similarly to physical properties**

# Why do Intellectual Property (IP) laws exist?

**A public good is…**

- ***non-rival:*** one person using it does not prevent another from using it
- ***non-excludable:*** you cannot easily stop anyone from using it easily

***Under-provision*** of a public good is a type of ***market failure***

- The private market (creators, firms) do not have the incentive to provide a public good on their own

➢Intellectual Property (IP) is a public good

# Why do Intellectual Property (IP) laws exist?

- To **incentive** something of societal value – e.g., inventions (patents) and creative works of expression (copyright) that would otherwise be **under-produced in the absence of such laws**

**Market failure !**

Why don't creators produce inventions or works of art anyway?
- Costly to produce (e.g., money, time) and require a lot of resources
- Difficult to prevent others from using once they exist
- No economic returns to the creators themselves

# Why are IP laws important?

- For **creators**

# Intellectual Property laws protect creators

- IP laws provide exclusive rights to **the creator(s)** of an intellectual property

➢e.g., inventors and authors of artistic and literary works

➢that give them the ability to control how their creations can be used (for a definite or indefinite period of time)

➢to incentivize the IP's creation in the first place

# Why are IP laws important for creators?

If you are an inventor or creator of original works, IP laws…

➢Prevent others from <span style="color:orange">claiming ownership of your idea</span>

➢Prevent others from <span style="color:orange">using your works inappropriately</span>

➢<span style="color:orange">Attract investors</span> to fund your inventive or creative idea

➢Allows you to generate <span style="color:orange">future revenues by licensing</span> your IP
- Licensing: partial transfer of IP rights, and get royalty payments on the licenses

# Why are IP laws important?

- For **creators**

- For **private businesses**

# Why are IP laws important for businesses?

- Large industrial conglomerates own a large amount of IP
  - they often hold a portfolio of different IP types: patents, trademarks, etc.

- Brand strategy (trademark): well-known brands attract consumers and generate revenues because of its goodwill (established reputation)

- Of course, also: movie studios, record labels, art galleries, etc.

- ✓ Economy-wide importance: IP-intensive industries account for
  - 41% of U.S. economic activities, and >62 million jobs (44% of total employment)

# Why are IP laws important?

- For **creators**

- For **private businesses**

- For **society at large**

# Why are IP laws important for the society?

- By construction, IP laws are to <span style="color:purple">incentivize inventions and creative works</span> – public goods that are valuable to the society

- Do they effectively achieve their intended goals?

- Not sure, they have costs, too...

➢E.g., takes times and resources to obtain and enforce IP rights
➢Litigations can be very costly to businesses
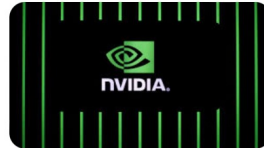➢Entrepreneurs need to avoid infringing on existing IP

**copyright infringement**

Nvidia faces lawsuit from authors over alleged copyright infringement in AI models

Mar 10 • Eric Revell

Reuters
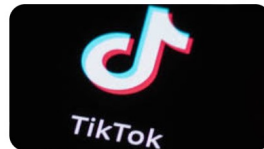Universal Music sued for copyright infringement over Mary J. Blige sample

22 days ago • Blake Brittain

NME
Sony awarded more than $800k over TikTok copyright infringement

4 days ago • Anagricel Duran

FORTUNE
Fashion giant Shein has been slapped with yet another lawsuit alleging copyright infringement, data scraping, and AI to ...
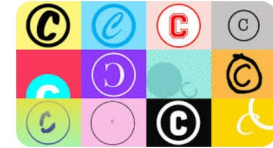
11 days ago • Sasha Rogelberg

The Register
Ex-Amazon exec claims she was asked to ignore copyright law in race to AI

AXIOS
Court to decide fate of Gen AI under copyright law in 2024

Jan 2 • Megan Morrone

Forbes
China Rules AI Firm Committed Copyright Infringement

Feb 29 • Johanna Costigan

Reuters
How copyright law could threaten the AI industry in 2024

Jan 2 • Blake Brittain

The New York Times
The Times Sues OpenAI and Microsoft Over A.I. Use of Copyrighted Work

Dec 27 • Michael M. Grynbaum & Ryan Mac

The New York Times
Boom in A.I. Prompts a Test of Copyright Law

# Social costs of IP protection

- **Market power** of IP owners: they may attempt to maintain market dominance and stifle competition
  - Rent seeking behavior: "an entity seeks to gain wealth without reciprocal contribution of productivity"

- **Distracts away from the innovation itself** and focuses instead on securing IP rights: firms spend too much resources or efforts to obtain IP rights

- **Constrains future innovation**: if used to prevent competitors' R&D efforts on similar technologies, can hamper development of new technology that builds on prior inventions

# Primary IP types & their basic characteristics

| | Who & What | How to obtain | Duration of protection |
|---|---|---|---|
| Patents | Original, novel inventions that are industrially applicable | File an application (may cost thousands of $) and be approved | Generally, 20 years from the patent application filing date |
| Copyright | Creative works of authorship, e.g., books, paintings, movies, songs, & computer software (considered literary work) | Automatically granted upon creation, but requires registration to be able to sue others for infringement | Person: author's life + 70 yrs Work for hire: 95 years from publication, or 120 years from creation (whichever comes first) |
| Trademarks | Distinctive symbols, names & images used in commerce that evokes association with a particular producer | Registration with the government | Indefinitely, until it loses distinctiveness or is no longer used in commerce |

- International efforts to harmonize IP laws but still some differences across countries

# Is there a market for IP rights?

- Intellectual Property (IP): a legal term referring to intangible property that result from creativity
- IP rights naturally belong to creators, but can be transferred via...
  - Assignment: transfer *all* rights of an IP
  - Licensing: transfer *partial* rights of an IP


➢Through licensing agreements, IP owners can exercise certain rights (e.g., buying, selling, licensing, leverage) in similar ways as those applied to physical properties

➢Firms can also use licensing agreements to obtain (rather than protect) intellectual property for their businesses

# IP Licensing Agreements

- Partial transfer of IP rights
- Various types of rights
  - E.g., can transfer the right to *use* the work, but prohibit third party from *modifying* the work
  - E.g., can transfer the right to *modify* the work, but reserve the exclusive right to *distribute* the work to the public

# Alternative to copyright: open-source

- Common for *software programs*

- Open source software (OSS):
  - Original source code that is designed to be *freely accessible* by the public, and anyone can *modify* and *redistribute* it

# Open-source AI

## TechCrunch Minute: Meta's new Llama 3 models give open source AI a boost

Alex Wilhelm   @alex   /   6:00 PM GMT+2 • April 19, 2024                    💬 Comment
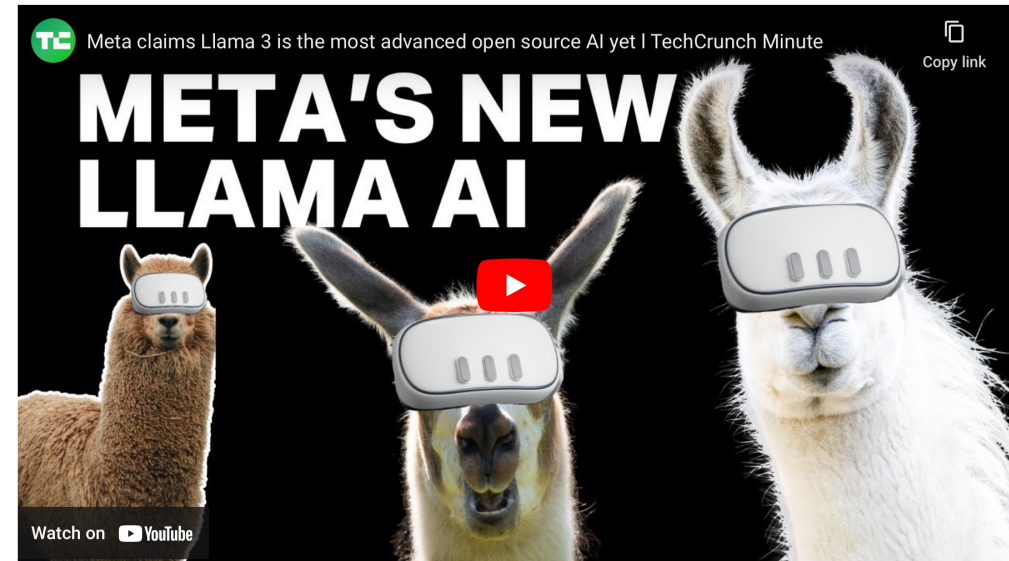


New AI models from Meta are making waves in technology circles. The two new models, part of the Facebook parent company's Llama line of artificial intelligence tools, are both open source, helping them stand apart from competing offerings from OpenAI and other well-known names.

Meta's new Llama models have differently sized underlying datasets, with the Llama 3 8B model featuring eight billion parameters, and the Llama 3 70B model some 70 billion parameters. The more parameters, the more powerful the model, but not every AI task needs the largest possible dataset.

# Alternative to copyright: open-source

- Common for *software programs*
- Permissive (academic: modify and distribute) vs. copyleft (free but require derivative work to be distributed under a similar license)

- Follow-on work must be open as well
- Tradeoffs
  - Lowers costs to follow-on development work
  - Reduces incentives to create in the first place
  - Requires dedicated long-term maintenance
- ➢Large companies with market power use it to accelerate development

# Open-source AI



**Strategic benefits** of opening sourcing AI development for **large dominant firms**:

- "advantages from being the open-source leader"
- get "community feedback, scrutiny and development"
- Open-source software often become industry standards
- Open-sourcing the "general infrastructure" not the data

# Open-source AI

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# Hints and ideas for your assignment

- This lecture:
  - Why are there so many IP lawsuits around AI recently?
  - What IP strategies should large tech companies take on around AI development (e.g., closed vs. open)?
- Next lecture: check out the following cases
  - **Zarya of the Dawn** (How should IP regime protect AI-generated artwork?)
  - **ChatGPT spits out training data** (Who are liable when use of AI tools infringe on IP or cause harm more generally?)
  - **NYTimes sues OpenAI/Microsoft** (When does the development of an AI system infringe on the rights of existing IP holders?)

# References

- Wagner, R. P. (n.d.). *Introduction to Intellectual Property* [MOOC]. Coursera. https://www.coursera.org/learn/introduction-intellectual-property

- Italiano, A. (n.d.). *Artificial Intelligence and legal issues* [MOOC]. https://www.coursera.org/learn/artificial-intelligence-and-legal-issues/home/info