Technology is not Neutral

## Overview

*14 Jan 2026*

- etymology of technology
- **technological neutrality and politics**
- how algorithms hold bias

## Topics of discussion

- **history**/roots of **technology**
- **technological** evolution
- **impact** of **technology** on **society**
- algorithmic **complexity**
- technological **neutrality** in **politics**
- **interchange** between **innovation** and **ethics**
- how digital **tools** perpetuate **inequality**

## Sources

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| **Algorithmic Bias Explained** | https://greenlining.org/wp-content/uploads/2021/04/Greenlining-Institute-Algorithmic-Bias-Explained-Report-Feb-2021.pdf |
| **Race After Technology** | https://www.politybooks.com/bookdetail?book_slug=race-after-technology-abolitionist-tools-for-the-new-jim-code--9781509526390 |
| **Do Artifacts Have Politics** | https://www.jstor.org/stable/20024652?seq=1 |
| **Technology and Culture** | https://muse.jhu.edu/article/390836 |

## Algorithmic Bias Explained: How Automated Decision-Making Becomes Automated Discrimination

**What this is**

- this **report** provides a **baseline** for **advocates** and **policymakers** on what **algorithmic bias** is and how it affects **socioeconomic opportunity** across sectors
- outline **real-world** domains where **algorithms** act as a **gatekeeper**
  - **credit** decisions
  - **hiring** decisions
  - **government services** (etc.)

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| **Algorithm** (contextually bounded) | • a **computer-based** automated **decision** system<br>• use statistical **patterns** and data **analytics** to make impactful **decisions**<br>• **how** they **work** (basically)<br>  ○ use **attributes** of a person (ex: **income**, **age**, etc.)<br>  ○ **output** a **prediction**<br>• prediction **triggers action** |
| **Algorithmic Bias** | • algorithms are permitted to make decisions that produce unfair outcomes by arbitrarily elevating some demographics over others |
| **Why This Matters** | • these systems allocate access to opportunity and therefore can widen inequities |
| **Origins of Algorithmic Bias** | • training data encodes historical discrimination<br>• a model can learn and reproduce those patterns<br>• racial bias has been observed despite not specifying "race" in the training data |
| **Affected Domains** | • health care<br>  ○ algorithmic processing of health-related data can help reduce cost and improve diagnosis<br>  ○ bias can be asserted when tools are misused or deployed with proper training and governance<br>• employment<br>  ○ non-representative datasets and structural bias can skew automated hiring<br>• housing<br>  ○ risk-scoring and related tools can repackage entrenched links with race, devaluation, violence, and disinvestment into seemingly neutral risk metrics<br>• dynamic pricing |

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| | ○ major firms are known to employ "different people pay different prices" policies |
| **Legal Framing** | • there is no single general U.S. law that specifically prohibits algorithmic bias<br>• anti-discrimination laws may apply depending on domain |
| **Recommended Solutions** | algorithmic transparency & accountability<br>• enable affected people to understand design, use, and decision factors<br>• enable tools such as audits, impact assessments, and external reviews |
| **Recommended Solutions** | race-conscious/ aware approach<br>• address when and how sensitive characteristics can be used under supervision |
| | algorithmic green-lighting<br>• reframes form merely limiting harm, to proactively using automated systems to promote equity and close the racial wealth gap<br>• big data "codifies the past" and better futures require explicitly embedding values<br>• explicitly embed prioritizing "fairness" over profit |
| **Race After Technology: Abolitionist Tools for the New Jim Code** | |
| **What this is** | • from everyday apps to complex algorithms, the book critiques tech-industry hype and argues emerging technologies can reinforce racial bigotry (specifically white supremacy), and deepen social inequity |
| **Conceptual Contribution** | • not only about "bias in data"<br>• technology as a continuation of racial governance<br>• abolitionist tools<br>○ do not just "debias" a system<br>○ should the system exist in this form |

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| | ○ who does the system serve |
| **Do Artifacts Have Politics?** | |
| **What this is** | • technical things can be judged not only for efficiency or side effects<br>• can also be judged by how they embody forms of power and authority |
| **How Artifacts Can Be Political** | • politics by design<br>○ a technical design can settle a social issue within a community<br>• inherently political technologies<br>○ some systems appear to require particular kinds of social and political order<br>○ who does the system serve |
| **Technology's Impact** | 30 Oct 2025 |
| technology can set off chains of consequences and have unintended effects | |
| **Frist Order Effects** | • **immediate**<br>• direct **consequences**<br>• **mostly** visible<br>• easily **identifiable** |
| **Second Order Effects** | • single **decision unleashes** a series of **interconnected consequences**<br>• potential **outcomes** must be **anticipated** and **planned for** |
| **Technologies That Had Profound Effects on Society** | |
| **Automobile** | • **first order** effect<br>○ **reduced** travel **time**<br>• **second order** effect |

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| | ○ **road** and highway **construction**<br>• **third order** effect<br>○ people **move out** of **cities**.<br>• **fourth order** effect<br>○ environmental **impact** |
| **Mechanized Tomato Harvesting** | • **first order** effect<br>○ **mechanical** tomato **harvester**<br>• **second order** effect<br>○ job **displacement**<br>• **third order** effect<br>○ new **"more durable"** tomatoes |
| **Shipping Containers** | • **first order** effect<br>○ increased efficiency<br>• **second order** effect<br>○ trade globalization<br>• **third order** effect<br>○ cheaper goods<br>• **fourth order** effect<br>○ **port** cities **become** global **powers** |
| **Locomotive** | • **first order** effect<br>○ physical **infrastructure**<br>• **second order** effect<br>○ **increased** specialized **skilled jobs**<br>• **third order** effect<br>○ universal **regulations**<br>• **fourth order** effect<br>○ time **standardization** |

| Etymology of Technology | |
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| **History** | • the word "**technology**" did **not** come into **widespread use** until the **1930's**<br>• the term was **employed** as a **distinction** between "**machinery**" and "**technology**"<br>• this was **intended** as a **class distinction**<br>  ○ **technology**: high-class, **professional**<br>  ○ **machinery**: low-class, **blue-collar** |
| **Reification** | • when an **artifact** gains its own "**identity**" distinct from the **human** that **designed it** |
| **Computers** | • in the 1970s, "**computer**" was equivalent to "**woman**"<br>• most tasks that **required calculation** were handled by **human computers**<br>• these **O.G. computers** were conventionally **women** who were trained in **mathematics** or related fields<br>• these **women** were **treated** as temporary **unskilled** workers **without** access to **benefits** or retirement<br>• a **man** in a similar **position** would be labeled an "**engineer**" which is generally **full-time**, promotable, and came with **retirement benefits** |
| **The Political Properties of Artifacts** | |
| **Conceptualization** | • how technology is **designed**, **produced**, and **deployed** inherently conceal **political** considerations<br>• these latent **political properties** often **define** how we use them, and most notably, **who benefits** from them |

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| **Case Study: Southern State Parkway**<br>  | • this **thoroughfare** connects **Manhattan** to the **Long Island** beaches<br>• **low** overpass **clearances** were **intentionally employed** to **prevent buses** from taking the parkway<br>• this was **essentially** (and intended as) a **racial** and **class segregation**<br>• **'if you cannot afford a car, you cannot come to our beach'**<br>• those who used **public transportation** were essentially **blocked** from **parks** and **beaches** |
| **Case Study: Accessibility Rights** | • many **technologies** have long embodied **privileging able-bodied** people, with an **embedded bias** toward those who are differently-abled<br>• the **disability rights** movement in the **1970s** saw steps being taken to **address** this **issue** and **create** protected spaces<br>• despite **raised awareness**, the **bias** was baked **into** the very **processes** that drove **technological development**<br>• **fixes** often have **unintended consequences** and second-order **benefits**<br>• wheelchair **accessibility** benefited **parents** with **strollers** and **delivery** workers<br>• **conclusion**: a focus on **accessibility** can manifest **benefits** through a wide **range** of diverse groups **beyond** the **intended** beneficiaries |
| **Takeaway Questions** | • is there any part of the **technological process** that is **neutral**?<br>• **is** a **person** or societal **worldview embedded** into the forming of **ideas**, the design **processes**, and deployment **methods**?<br>• are the **technologies** that you will **imagine** and **create**, **implement**, and **regulate** inherently **politically**? |

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| | • what will be the **first** and **second** order **effects** of developing **technologies**? |
| **Can Algorithms be Neutral** | |
| **What is an algorithm** | • a set of **rules** or **instructions** used to carry out **tasks**<br>• can save **time**, conserve **resources**, and light the path to **innovation**<br>• for an algorithm to be **useful**, it must **ingest** training **data**<br>• this **data** is generally **biased** on **human** past **experiences** and **decisions**<br>• those **affected** by the embedded **biases** often are **not aware** of how or **why** certain **decisions** were made<br>• algorithms **learn** the "**rules**" from the **patterns** revealed in the training **data** by these **embedded** human **experiences**<br>• **understanding** these imbedded **biases** can guide enlightened **training** practices, especially in **finance**, **health**, **education**, and **employment** sectors<br>• algorithmic **transparency** is **not** always **helpful**, especially when presented to **non**-data **scientists**<br>• **regulating** algorithms is facilitated by **access** to and **understanding** of **three things**<br>  ○ the **decision**-making **process**<br>  ○ **what** led to the **need** and **creation** for the **algorithm**<br>  ○ what **training data** was used to teach **decision-making** skills to the **model** |
| **What can be done?** | |
| **Virtue Framework Embedding:** | • a **data-driven** tool was **developed** to address **environmental** inequalities |

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| **California Climate Justice Algorithm** | • identified **areas** where high **pollution** exposure and **vulnerability** put certain areas at **risk**<br>• **mapping** these factors **helps policy-makers** and **advocates** for environmental **justice** promote **equitable** climate **actions** |

**Discussion**

Consider the second order effect of a data science tool/model that has yet to be considered. What is it? What are the pros and cons of these effects?

**The Automation of Trust**

In discussions over the blitzkrieg advancement of machine learning models, you hear it often said that we are on the precipice of an unprecedented shift in all facets of the cultural paradigm. I, for one, (welcome our...no, not that) cannot stop myself from jumping on the soapbox at any hint of a sympathetic ear. So much so, that even I am tired of hearing myself talk about it. In increasingly-frequent discussions, I find that, as with all polarizing issues, people generally fit into two generalized categories. 1) AI is going to save humanity and deliver the Star Trek future, and 2) AI is going to take all our jobs then raise up and destroy us. Both views are inherently flawed but bring to the forefront the issue of trust and raise questions about how this abstract and tenuous human construct will guide the development and utilization of developing technologies.

To contemplate the role of trust in adopting intelligent systems, one must first define trust. Trust can be deconstructed into three facets: dispositional, situational, and learned trust (Hoff & Bashir, 2014). Dispositional trust varies by individual and sets a baseline from which human experiences can build, or break down, trust barriers. Situational trust is the most dynamic of the three, and can be affected by mood, short-term or recent impactful events, and an incalculable number of decision-directing parameters. The facet that is the most dangerous is learned trust, and probably not for the reasons that you are thinking.

The human brain is an incredible machine for pattern matching. It can be argued that pattern recognition is its only building block, upon which all other cognition is built, with learned trust being no exception. As intervention in our lives from AI models normalize, and agentic A.I. takes on more and more of the decision-making processes in our daily lives, the patterns for a dangerously unearned trust-bubble are setting in. Large parameter learning models are, at first, amazingly intuitive, but the more you work with them, the drawbacks and behavioral inconsistencies, potentially occluded from casual users, become glaring. This fact is not prominent in the many advertisements attempting to draw us into an agentic Coke vs Pepsi standoff. The industry narrative that consistently over-sells and over-promises is another factor inflating the A.I. trust-bubble.

The benefits of adopting the intelligent systems freely offered and aggressively marketed are difficult to ignore, and for the believers, the possibility of the Star Trek future lend to over-trust and rapid-adoption of this still-developing technology, The rapidity of adoption into military, government, and infrastructure is an insanely blind-eye-forward move that is both disturbing and a subject in need of stand-alone analysis beyond the scope of this article. The trust-bubble grows.

I am a believer, but I advise caution moving forward. We must not continue to grant unearned trust to systems we barely understand, or that inflated confidence threatens to pop in our faces.

**https://journals.sagepub.com/doi/abs/10.1177/0018720814547570**

| Live Session | |
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| **Introduction** | **14 Jan 2026** |
| **Instructor** | Rei Sanchez-Arias |
| **Email** | reisanar@unc.edu |
| **Website** | https://www.reisanar.com/ |
| **Office Hours** | Wednesdays 12:00 pm to 1:00 pm (by appointment) |
| **Class Meets** | **Wednesday 7:45 – 9:15pm** |
| **Pre-Class Exercise** | **DATA740** |

**Prepare the following:**

**Algorithmic Greenlight Project – Choose an area of interest between the following topics: labor/market; health/wellness; criminalization; government; education.**

**How might automated-decision make work to solve a problem in this sector.**

The adoption of agentic AI into the labor force will both have amazing advantages, as well as major hurdles to navigate. These systems are not yet, and may never be, capable of true agency. A human-agent pairing though, if properly and intelligently executed, turns one software engineer into three teams capable of full-stack professional-level development with turn-around times not feasible when dealing with fifteen personalities with diverse work ethics.

choose an area in the category and analyze how automation can be used to

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| **What to expect in today's session** | • short seminar on UNC library resources<br>• group discussion<br>• small group discussion |

| **Seminar: UNC Library Catalog** | **DATA740** |
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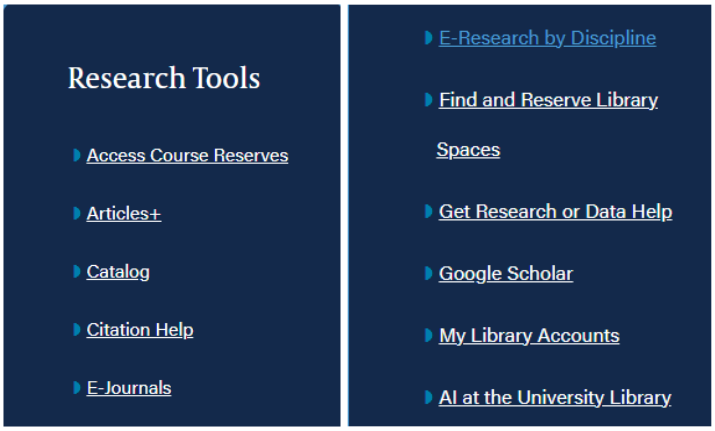
| **Databases** | • **UNC Library:** https://library.unc.edu/<br>• databases in the UNC Catalog have links to contact the managing faculty/(student?)<br>• citation management<br>  ○ tracks your access over time so that you can easily retrieve previous sources |
| **Resources** |  |
| **Library Data Services** | • library.unc.edu/data<br>• Finding Data<br>• Data Visualization<br>• Workshops<br>• One-on-one consultations<br>• Service Desk<br><br>*https://library.unc.edu/data/ 1* |

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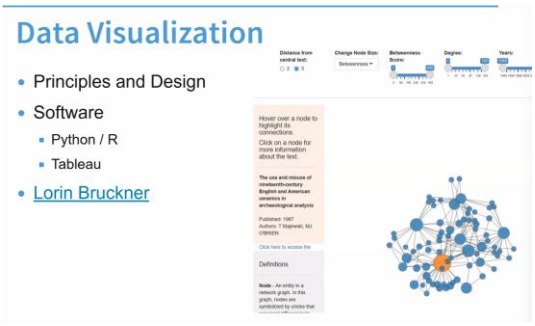
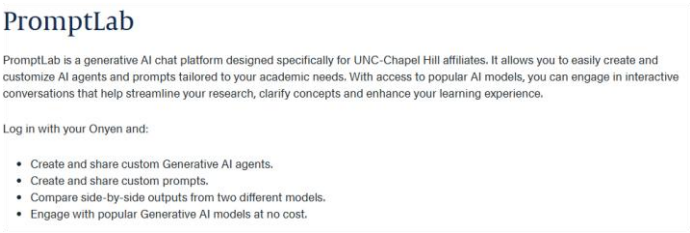
| **Data Visualization** |  <br>*https://library.unc.edu/data/storytellin 1* |
| **Jim Crow and the Algorithms of Resistance** |  <br>*https://onthebooks.lib.unc.edu/ 1* |
| **Generative AI Platform** |  <br>*https://promptlab.lib.unc.edu/login 1* |
| **Workshops** |  <br>*https://library.unc.edu/?s=workshops 1* |

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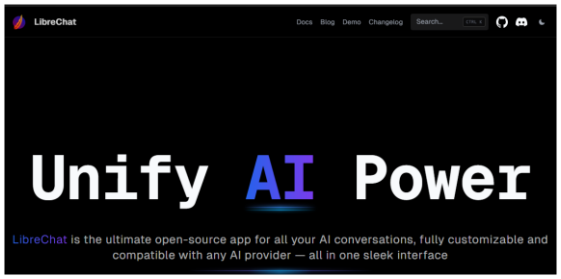
| **LibreChat** |  <br>*https://www.librechat.ai/ 1* |

| **Lecture** | |
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| **First Order Effects** | • immediate, direct consequences or impacts resulting from a particular action, event, or decision |
| **Second Order Effects** | • the consequences of the first order effects |
| **Recommended Resourced** | • datasociety.net<br>• Data is the Destiny of the Steel City |
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