



BITS Pilani

Pilani | Dubai | Goa | Hyderabad

INTRODUCTION TO DATA SCIENCE

SESSION # 13 : ETHICS FOR DATA SCIENCE

IDS Course Team

BITS Pilani

The instructor is gratefully acknowledging
the authors who made their course
materials freely available online.

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1 ETHICS FOR DATA SCIENCE

INCIDENT 1



- On March 18, 2018, at around 10 p.m., Elaine Herzberg was wheeling her bicycle across a street in Tempe, Arizona, when she was struck and killed by a self-driving car. Although there was a human operator behind the wheel, an autonomous system—artificial intelligence—was in full control.

<https://harvardmagazine.com/2019/01/artificial-intelligence-limitations>

ETHICAL AND PROTO-LEGAL QUESTIONS

- What moral obligations did the system's programmers have to prevent their creation from taking a human life?
- Who was responsible for Herzberg's death?
- The person in the driver's seat?
- The company testing the car's capabilities?
- The designers of the AI system, or even the manufacturers of its onboard sensory equipment?

<https://harvardmagazine.com/2019/01/artificial-intelligence-limitations>

INCIDENT 2



- In 2014, Amazon developed a recruiting tool for identifying software engineers it might want to hire; the system swiftly began discriminating against women, and the company abandoned it in 2017.

<https://harvardmagazine.com/2019/01/artificial-intelligence-limitations>

INCIDENT 3



- In 2016, ProPublica analyzed a commercially developed system that predicts the likelihood that criminals will re-offend, created to help judges make better sentencing decisions, and found that it was biased against blacks.

<https://harvardmagazine.com/2019/01/artificial-intelligence-limitations>

JULIA BOSSMANN'S TOP 9 ETHICAL ISSUES IN AI

UNEMPLOYMENT What happens after the end of jobs?

INEQUALITY How do we distribute the wealth created by machines?

HUMANITY How do machines affect our behavior and interaction?

ARTIFICIAL STUPIDITY How can we guard against mistakes?

RACIST ROBOTS How do we eliminate AI bias?

SECURITY How do we keep AI safe from adversaries?

EVIL GENIES How do we protect against unintended consequences?

SINGULARITY How do we stay in control of a complex intelligent system?

ROBOT RIGHTS How do we define the humane treatment of AI?

<https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/>

FIVE ETHICAL FOCAL AREAS

- Accountability
- Value Alignment
- Explainability
- Fairness
- User Data Rights

- Every person involved in the creation of AI at any step is accountable for considering the system's impact in the world, as are the companies invested in its development.
- AI designers and developers are responsible for considering AI design, development, decision processes, and outcomes.



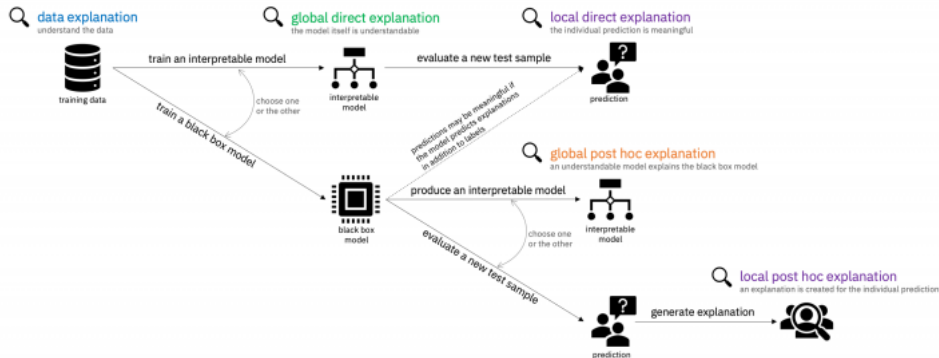
- Ensure sensitivity to a wide range of cultural norms and values.
- AI should be designed to align with the norms and values of your user group in mind.
- Values are subjective and differ globally. Global companies must take into account language barriers and cultural differences.

<https://www.ibm.com/design/ai/ethics/value-alignment>

- AI should be designed for humans to easily perceive, detect, and understand its decision process.
- Decision-making process of AI should be explainable in terms people can understand.
- Your users should always be aware that they are interacting with an AI.
- Ensure an AI system's level of transparency is clear.
- <https://github.com/ibm/aix360>

<https://www.ibm.com/design/ai/ethics/explainability>

IBM RESEARCH AI EXPLAINABILITY

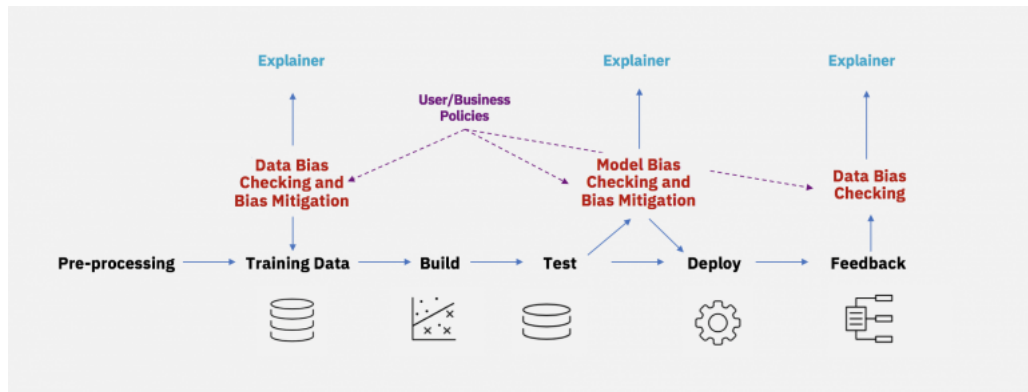


<https://www.ibm.com/blogs/research/2019/08/ai-explainability-360/>

- AI must be designed to minimize bias and promote inclusive representation.
- Minimize algorithmic bias through ongoing research and data collection which is representative of a diverse population.
- Your AI may be susceptible to different types of bias based on the type of data it ingests.
- <https://github.com/IBM/aif360>

<https://www.ibm.com/design/ai/ethics/fairness>

IBM RESEARCH AI FAIRNESS



<https://www.ibm.com/blogs/research/2018/09/ai-fairness-360/>

USER DATA RIGHTS

- AI must be designed to protect user data and preserve the user's power over access and uses.
- EU's General Data Protection Regulation and of other countries

<https://www.ibm.com/design/ai/ethics/user-data-rights>

- Factsheets for AI services
- <https://github.com/Trusted-AI/AIX360>
- <https://www.ibm.com/blogs/research/2018/08/factsheets-ai/>
- <https://www.youtube.com/watch?v=Yn4yduyoQh4>

QUESTIONS



- Given a scenario, identify the ethical issues in it.
- For ensuring data privacy, what are the measures to be followed to prevent data leakage.
- Can you use data masking for ensuring data provacy?
- How to prevent data leakage?

THANK YOU