

Lecture 3: DEI Principles in AI Ethics: Navigating the Challenges of Bias

Exploring the Intersection of Diversity, Equity, Inclusion, and Artificial Intelligence

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Section 1

1: Recap from Last Week

Lectures: Sustainability (3x3) and Leadership

- People, Planet, Profit
- Identifying leadership behavior - Act like a leader?

Labs: 'A' and 'B'

- Identify Apple Inc. Related Cases
- Sustainability and Leadership in Action: What do you see

Five General Cases:

1. Recycled and Renewable Materials in Products

- **People:** Improves people's quality of life; creates awareness; benefits health.
- **Planet:** Helps conserve resources, reduces carbon dioxide emissions, achieves carbon neutrality, and less waste.
- **Profit:** Lowers overall production costs, boosts GDP, reduces cost and increases profit by avoiding new materials.

2. Clean Energy and Carbon Reduction Efforts

- **People:** Grants to help communities, increase convenience, benefit health.
- **Planet:** Decarbonizing emissions, creating less waste, recycling materials.
- **Profit:** Boosts revenue by making operations more efficient, lowers costs of production, and ensures resilience in the supply chain.

Five Cases (Continued):

4. Product Design and Innovation to Reduce Waste

- **People:** Increases convenience and boosts quality of life.
- **Planet:** Creates less waste, reduces materials needed, lowers environmental impact.
- **Profit:** Boosts profit by reducing costs associated with manufacturing cables and increasing marketability.

5. Labor and Ethical Sourcing

- **People:** Improves access to renewable energy for underprivileged people and spreads the message of sustainability.
- **Planet:** No harm to the environment by promoting sustainable practices.
- **Profit:** Not much short-term profit, but boosts long-term community economic growth.

Summary of takeaways:

Summary of Triple Bottom Line:

- **People:** Many comments focus on the positive impact on human health, access to resources, convenience, and social awareness.
- **Planet:** Significant emphasis on reducing waste, carbon emissions, and overall environmental impact.
- **Profit:** Profit is often described as long-term rather than short-term, with emphasis on cost savings, increased marketability, and community economic growth.

Connect to various leadership principles:

- **Transformational leadership** pushes employees and stakeholders toward a shared vision of sustainability.
- **Transactional leadership** ensures clear expectations and rewards, especially in supply chains and trade-in programs.
- **Collaborative and democratic leadership** involve multiple sectors

Section 2

DEI Principles in AI Ethics: Navigating the Challenges of Bias

2: Introduction

- What is DEI?
 - Diversity: Variety in human differences
 - Equity: Fair treatment and access
 - Inclusion: Environment where all can thrive
- AI Ethics: Ensuring AI systems are fair and unbiased
- Today's Focus: How DEI principles apply to AI development and deployment
- Why are we having this session: **DEI are being compressed into datasets, which then gets used to derive 'insights' for leaders to act upon.**

2.1: Introduction (Continued)

- Directly impacts an organization's long-term viability and social responsibility.
- Sustainable leaders must ensure that AI systems to be:
 - fair,
 - unbiased, and
 - beneficial to all stakeholders.
- Ignoring DEI in AI can lead to reputational damage, legal risks, and erosion of trust, undermining sustainability efforts.
- From a triple-bottom line perspective, this relates to:
 - people (ensuring AI benefits all segments of society),
 - planet (using AI ethically to address environmental challenges), and
 - profit (developing trustworthy AI for long-term business sustainability).
- Key competency for leaders aiming to build resilient, ethical, and sustainable organizations in our increasingly AI-driven world.

3: The Problem of Built-in Biases

- Sources of AI Bias:
 - ① Data Collection
 - ② Algorithm Design
 - ③ Interpretation of Results
- *An AI system once classified a turtle as a rifle. Let's explore why!*

3.1 Turtle as Rifle, a built-in bias example

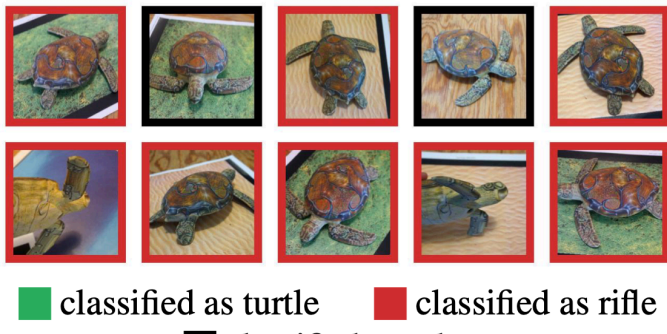


Figure 1. Randomly sampled poses of a 3D-printed turtle adversarially perturbed to classify as a rifle at every viewpoint². An unperturbed model is classified correctly as a turtle nearly 100%

4: Interactive - Spot the Bias

- Instructions: Identify potential biases in these scenarios
 - ① A speech recognition system struggling with accents
 - ② An image dataset with 80% male CEOs
 - ③ A predictive policing algorithm focusing on certain neighborhoods
- Discussion: What biases did you spot? How might they impact real-world applications?



5: Case Study 1 - Twitter's Image Cropping Algorithm

- The Issue: Algorithm favored white faces over black faces
- Root Cause: Focus on high contrast areas and facial features
- Impact: Reinforced racial biases in social media representation
- Twitter's Response:
 - Made algorithm choices more transparent
 - Eventually removed automatic cropping

6: Case Study 2 - Amazon's AI Recruiting Tool

- The Problem: AI tool discriminated against women
- Key Issues:
 - Trained on 10 years of resumes, mostly from men
 - Penalized resumes including “women’s”
 - Downgraded graduates of women’s colleges
- Amazon’s Action: Discontinued the tool
- Teaser: “Imagine applying for your dream job, but the AI says no. Ever heard of the ‘this is an exemplary candidate’ trick?”

7: Leadership in DEI and AI Ethics

- Leaders' Roles:
 - Champion diversity in AI teams
 - Mandate thorough bias testing
 - Foster a culture of ethical AI development
- Why It Matters:
 - Business: Broader market appeal, avoid PR disasters
 - Ethical: Fair opportunities for all
 - Social: Build trust in AI technologies
- Reflection: "As a future leader, how will you promote DEI in tech?"

8: Scenarios - Possible

Here're some very straight forward examples of AI-driven solutions that you could develop without having good DEI awareness:

- “The Resume Screener”: AI favors certain universities
- “The Loan Approver”: Lower approval rates for specific postcodes
- “The Employee Performance Predictor”: Bias against flexible workers
- Discussion: Identify DEI breaches and propose solutions

9. Scenarios - Real

Now let's look at some real debacle of DEI failures by big corporates and highly-paid execs:

- Google Image Recognition Controversy (2015) : Tags
- Amazon's AI Hiring Tool Bias (2018): Data
- Microsoft's *Tay* Chatbot Incident (2019): Guardrails/24h
- Uber's Facial Recognition System Failure (2021): Facial Rec Color

10: Critical Thinking - The Complexities of “Fair AI”

Title: “Fair for Whom? Navigating the Complexities of DEI in AI”

- The Dilemma of Fairness:
 - What does “fair” mean in different contexts?
 - Can optimizing for one group inadvertently disadvantage others?
- Potential Trade-offs:
 - Accuracy vs. Inclusivity
 - Generalizability vs. Specificity
 - Speed of development vs. Thorough bias checking
- Discussion Angles:
 - “Is ‘fair AI’ truly fair for everyone? Who might be left out?”
 - “How do we balance addressing historical inequities without creating new ones?”
 - “What are the risks of over-correcting in AI design?”

10.1: Critical Thinking - The Complexities of “Fair AI” (Continued)

- Case Example:
 - An AI healthcare diagnostic tool is adjusted to be more accurate for underrepresented groups
 - Result: Slight decrease in accuracy for the majority group
 - Question: “Is this ethical? How do we decide?”
- Activity: “Ethical AI Design Spectrum” (if we have enough time)
 - Position yourselves on a spectrum in the room
 - One end: “Maximum DEI considerations in AI, even if it slows development”
 - Other end: “Rapid AI development with basic fairness checks”
 - Discuss reasons for their positions

11: Balancing Act - Doing Enough, But Not Too Much

- Key Considerations:
 - 1 Regulatory Compliance: Meeting legal requirements
 - 2 Ethical Imperatives: Going beyond the law to ensure fairness
 - 3 Practical Constraints: Time, resources, and technological limitations
- Finding the Balance:
 - Continuous testing and iteration
 - Diverse team input in all stages of development
 - Regular ethical audits and transparency reports
- Discussion Question: “How can we determine if we’ve done ‘enough’ to ensure fairness in AI systems?”
- Thought Experiment: “The AI Fairness Meter”
 - If you could design a tool to measure AI fairness, what metrics would you include?
 - How would you weigh different aspects of fairness against each other?

12: Conclusion and Next Steps

- Key Takeaways:
 - AI bias is often subtle but impactful
 - Proactive DEI integration is crucial in AI development
 - Ongoing vigilance and testing are necessary
- Your Action Item: “One thing I’ll do to promote DEI in tech...”
- Further Reading:
 - ① Open for a surprise: The endearing results of Twitter’s new image crop, VOX
 - ② Student proves Twitter algorithm ‘bias’ toward lighter, slimmer, younger faces, The Guardian
 - ③ NO Need to Worry about Adversarial Examples in Object Detection in Autonomous Vehicles, arxiv.org