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Relational Thinking: Bias and Discrimination in Data Science

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COMP2400/6400, S1, 2025: Media Presentation

What Is the Rational-Individualistic View?

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What is it?

- Prioritises “Reason and Logical Coherence [as] superior for knowledge production” (Birhane, 2021)
- Attempts to define an immutable and consistent underlying truth.
- Focuses on perceiving the world from a distant, objective, frame of reference.
- Silos and separates knowledge from its context in a larger system.

What are its implications for AI researchers, data scientists and developers?

- Creates misconceptions of the existence of a ‘neutral’ view.
- Assumes there is a correct, determinable answer.
- Intolerant of ambiguity.
- Often results in the removal of context from data.

What Is the Relational View?

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What is it?

- “Relational perspectives view existence as fundamentally co-existent in a web of relations” (Birhane, 2021)
- Prioritises understanding the relations and dependencies between all things.
- Contextualises knowledge based on what it affects, and is affected by.

What is the key assumption of Afro-feminist epistemology?

- Knowing is an active and engaged practice.
- Lived experiences are the most important and reliable form of knowledge.
- “Concrete experiences are primary and abstract reasoning secondary.” (Birhane, 2021).

What is the key assumption of Enactive Cognitive Science?

- Similar to Afro-feminism, knowing is an active practice.
- “Knowing is an activity that happens in the relationship between the knower and the known.” (Birhane, 2021)
- People and knowledge are not created in isolation, but are a product of their environment.

Centering the Disproportionally Impacted

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Core Assumptions

- Marginalised groups are disproportionally affected by AI systems.
- Marginalised groups hold an “epistemic privilege to recognise harm and discrimination.” (Birhane, 2021)
- Collaboration between data scientists and marginalised communities is critical to minimise harm.

How does this inform the development of ML algorithms?

- Greater emphasis on addressing power asymmetry in ML implementation.
- Design should be led by marginalised communities.
- Lived experiences should inform the development and implementation of AI.
- AI systems should move away from the

Prioritising of Understanding Over Prediction

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Core Assumptions

- Contextualised understanding is more important for knowledge production.
- Aims to examine patterns and determine why these patterns exist.
- Questions prior norms in data, as opposed to using them as a basis for predictive models.

How does this inform the development of ML algorithms?

- Explains bias in data in its social, historical, and cultural context.
- Promotes data scientists to question the conclusion ML algorithms draw as a result of bias.
- Frames AI as a tool for questioning historical patterns, instead of perpetuating them,
- Focuses less on de-biasing a dataset and more on analysing why that bias exists in the first place.

Mitigation Strategies

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Community Driven Design

- Involve marginalised communities in the development cycle.
- Implement lived experiences and contextual nuance.
- Empower community feedback loops

Contextual and Qualitative Analysis

- Supplement quantitative data with qualitative data.
- Analyse patterns in data to question historical biases and patterns.
- Collaborate with community to address underlying systemic inequalities.

Establish Iterative and Reflexive Evaluation Frameworks

- Implement continuous review processes focusing on both technical and social impacts.
- Regularly incorporate feedback from marginalised groups on data collection and AI implementation

References

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