COGS 9 - Introduction to Data Science Winter 24

Week 8 Discussion

Slides can be found here: https://github.com/PrasannaKumaran/COGS-9---WI24

Agenda for Today

- Accountability in Algorithmic Decision Making
- Machine Bias
- Project work
- Questions

Upcoming Deadlines

- Feb 26 - Assignment 2 due
- March 1 - Quiz 5 due
- March 8 - Assignment 3 due

Don’t forget to add team members!

Kindly assign pages to submissions

Accountability in Algorithmic Decision Making

- Algorithmic Decision Making
- Accountability
- Transparency

Algorithmic Decision Making: Prioritization

- Emphasize certain information over others.
- Essential in managing information overload.
- Examples include search engines, rankings of schools, hospitals.
- Design considerations include criteria definition, weighting.

Algorithmic Decision Making: Classification

- Mark entities as belonging to specific classes.
- Basis for downstream decisions; potential for bias and errors.
- Importance of training data and cultural context.
- Considerations include accuracy, false positives/negatives.

Algorithmic Decision Making: Association

- Create relationships between entities.
- Can lead to meaningful or unsettling implications.
- Example: search autocomplete linking names to negative terms.
- Challenges in quantification and interpreting correlations.

Algorithmic Decision Making: Filtering

- Involves including or excluding information.
- Essential in moderation and preventing misinformation.
- Risks of censorship and false positives.
- Importance of considering freedom of speech.

Accountability

- Government: Requires transparency and regulation for accountability to citizens.
- Private Sector: Faces market and social pressures for data accuracy and customer satisfaction.
- Transparency: Key for both sectors, but full disclosure not always necessary.
- Legal Frameworks: FOIA allows public access to government data; proposed FOIPA aims for deeper algorithmic transparency.

Transparency Standard

- Human Involvement
- Data
- The Model
- Inferencing
- Algorithmic Presence

Transparency: Human Involvement

Goal: Explain the algorithm's purpose and editorial goals.

Oversight: Detail who controls and oversees the algorithm, promoting accountability.

Team: Identify the creators or team behind the algorithm to highlight responsibility and enhance trust.

Transparency: Data

Quality: Communicate the data's accuracy, completeness, and timeliness.

Process: Describe how data is collected, transformed, and vetted, whether automatically or manually.

Privacy: Address how personal data is used and the safeguards for privacy.

Transparency: Model

Inputs: Clarify which features or variables the algorithm uses.

Weightings: Disclose how features are weighted in the decision-making process.

Tools: Share information about the software or modeling tools used, including their assumptions and limitations.

Transparency: Inferencing

Accuracy: Benchmark accuracy, highlighting error rates like false positives and negatives.

Confidence: Share average confidence values to indicate the level of certainty in the algorithm's outcomes.

Error Handling: Explain steps taken to address and correct known errors, whether due to data inputs or algorithmic process

Transparency: Algorithmic Presence

Usage: Disclose when algorithms are used, especially for personalization or A/B testing.

Filtered Content: Inform users about the content that has been algorithmically curated or omitted from their view.

Reading: Machine Bias

- Case study of how bias in a system can lead to major problems
- Vernon Prater - seasoned criminal
- Birsha Borden - teenager
  - System gave higher risk score to Borden
  - Heavily biased
- Study conducted by ProPublica
  - Only 20% people predicted to commit violent crimes
- Falsely flag black defendants as future criminals and white defendants were labeled as low risk

Reading: Machine Bias

- Northpointe's method
  - Survey consisting of 137 questions answered by defendants or pulled from criminal records
- Questions included:
  - Was one of your parents ever sent to prison or jail?
  - How many of your friends are taking drugs illegally?
  - How often did you get in fights while at school?
  - Agree/Disagree - "A hungry person has a right to steal"
- A guy with job can come off as low risk whereas a drunkard will be rated high risk because he's homeless.
- These risk score alone should not determine the sentence of an offender
- Includes many other case studies

Questions?

Make sure you filled out the attendance form

Attendance