COGS 9 - Introduction to Data Science Winter 24

Week 4 Discussion

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

Agenda for Today

- Quick overview of the Readings for this week
  - A Mulching Proposal
  - Data’s day of reckoning
- Questions

Reading: A Mulching Proposal

- Discusses the application of FAT framework to a proposed algorithm
- Algorithm tackles food security and population ageing
- Drastically increased the algorithm’s adherence to the FAT framework

Reading: A Mulching Proposal

- **F**airness, **A**ccountability, **T**ransparency Framework
  - Fair: lacing biases which create unfair outcomes
  - Accountable: answerable to the people who subject to them
  - Transparent: open about how and why a particular decision was made
- When satisfied, harmful outcomes by an algorithm are minimized

Reading: A Mulching Proposal

- Premise
  - Multiple ongoing crises
    - Aging population in Western Society
    - Reduction in arable farmlands due to climate change
- Developed program where elderly people are rendered down into fine nutrient slurry
  - Addresses both the above mentioned issues
  - Elderly are well compensated

Reading: A Mulching Proposal

- Proposed algorithm
  - Social credit
    - Based on social media and communications data
    - Identifies subjects with low levels of social connectivity
  - Photos of subjects below threshold are run through a system to identify age
    - > 60 are identified and spotted using UAVs
  - Brought to the nearest LNI processing centre

Reading: A Mulching Proposal

- Problem:
  - Participants responded negatively to the idea
  - LNI reached out to seek expertise to resolve anxiety of both consumers and those to be consumed
  - Given full access to the development team

Reading: A Mulching Proposal

- Fairness
  - Checked out demographic fairness
  - Did the system event distribute False Positives and Negatives across race and gender
  - Need to include transgender people
  - Algorithm disproportionately tagged cis-men as worthy of mulching
  - Collected additional data with more women, trans and people of color
    - Improved fairness

Reading: A Mulching Proposal

- Accountable
  - Ability to address any failure of inaccuracy produced by system
    - Important in the context of misclassification
  - Undertook formalized user testing, soliciting feedback from mulchees and relatives and friends prior to and after mulching
  - Pre-mulching involves drone itself for selected participants
    - Offered a 10s window to give feedback
    - In case of error, put through human operator at LNI who discusses
    - Use feedback to improve algorithm accordingly
  - Post-mulching reaches out to friends and family of the mulchee
    - Inform of the decision and provide serial nos. of food product
      - Next-of-kin was given 30d window to appeal

Reading: A Mulching Proposal

- Transparency
  - Are users aware of how the decision was made?
  - Pre-mulching:
    - Drone provides comprehensive list of variables considered
      - Phone, SMS, Facebook, Christmas cards, scores
  - Feedback gathered through user testing

Reading: A Mulching Proposal

- Conclusion
  - This paper highlight the dangers of blindly trusting algorithms and guidelines
  - Highlights the need for ethical considerations in technological advancements during all stages of development
  - Applying frameworks such as FAT is a minimum. You could satisfy a framework and still be unethical

Reading: Data’s day of reckoning

- Discusses the benefits and tension data has created
- What does it mean to take responsibility for building, maintaining, and managing data, technologies and services
- For instance the physics community had to grapple with implications of the atomic bomb

Reading: Data's day of reckoning

- Ethics and Security Training
  - Ideas taught in ethics classes are often disconnected from existing projects or course work
  - Don't learn how to implement principles leading to ill-preparedness
  - Not trained to think about how design and ethics are connected
  - Software security and ethics frequently go hand in hand
    - SQL injection attacks are not discussed in database classes
    - Submitted project might not address this and not graded based on it
  - Incorporate ethics within the core curriculum

Reading: Data's day of reckoning

- Ethical training for AI practitioners and students is a necessary part
- Are easily avoided when on a time crunch/rush
- Preparing a checklist can be crucial in not forgetting ethical issues
  - Tech can be attacked or abused?
  - Studied possible sources of bias?
  - User content?
  - Tested for fairness?
- Follow the FAT framework

Reading: Data's day of reckoning

- Ethics need to be part of an organization's culture
- Security is becoming part of corporate culture
  - Security teams are critical to an organization
- Incorporating ethics into corporate culture is challenging
  - Individual needs to be empowered
  - Anyone should be able to escalate issues without fear of retaliation
  - Part of Hiring Process
  - Product reviews must ask questions about product's impact
  - Teams must reflect diversity of thought, exp., race, background
  - Corporations must make their own principles clear
    - Google's "Don't be evil"

Reading: Data's day of reckoning

- Regulations
  - In some industries, ethical standards imposed by law and regulations
    - Nuremberg Code in response to Nazi atrocities
      - Focuses on individual consent to participation
  - Policy development process nearly always lags pace of innovation
  - Committees that make policy often lack experts with tech. background

Discussion Questions

Ethical Use of Algorithms: "In situations like Logan-Nolan Industries, where algorithms decide on serious matters, how do we decide what's ethical for these algorithms to do, especially when it involves people's lives?"

Responsibility in Algorithms: "When algorithms make mistakes or cause problems, who should be responsible? How can we make sure someone is accountable when these systems are so complex?"

Discussion Questions

1) Do you think the authors made the right decision in working directly with Logan-Nolan Industries to improve their algorithmic system? Why or why not? What are the ethics of collaborating with a company on a fundamentally unethical system?
2) Do you think the changes implemented truly make the system ethical? Or does it fail to address deeper issues with the underlying premise?
3) What algorithms (products) do you interact with in your day to day life that you consider to be unethical?
4) The authors acknowledge criticisms about their work potentially legitimizing an unethical system. Do you think think this concern has merit? How could researchers engage with industry while still maintaining ethical standards?

Discussion Questions

1. **Balancing Data Use and Privacy**: "In an era where data is everywhere, how can we balance the benefits of using data for analysis and the need to protect people's privacy?"
2. **Ethical Implications of Data Decisions**: "When data-driven decisions impact people's lives, what ethical considerations should data scientists keep in mind to ensure fairness and responsibility?"

Discussion Questions

1) What could we do as data scientists to avoid unethical algorithms from being deployed in public?
2) In an era where data is everywhere, how can we balance the benefits of using data for analysis and the need to protect people's privacy?

Questions?

Make sure you filled out the attendance form

Attendance