EDS 242: Ethics & Bias in Environmental Data Science

Quarter: Fall 2023
Units: 2

Instructor information, meeting times, & materials

Instructor: Dena Montague
Email: denamontague@ucsb.edu
Office hours: By appointment
The best way to contact me is: by email

Class meets:
  Lecture: M 3:30pm - 4:45pm PST (NCEAS)

All reading will be posted on Gauchospace:

Access and accommodations

Access and Accommodations: Please submit requests for accommodations often and early. It is never too late to apply for DSP accommodations. If you have any kind of disability, whether apparent or non-apparent, learning, emotional, physical, or cognitive you may be eligible to use formal accessibility services on campus. To arrange class-related accommodations, please contact DSP. DSP will initiate communication about accommodations with faculty. By making a plan through DSP, appropriate accommodations can be implemented without disclosing your specific condition or diagnosis to course instructors.
Basic course information

Course description:

This course will focus on ethical considerations in collecting, using, and reporting environmental data, and how to recognize and account for biases in algorithms, training data, and methodologies. Students will also examine the human and societal implications of these issues within environmental data science.

The course is arranged by four themes: 1) Foundations of Ethics and Bias, Race and Environmental Data 2) Data and Policy 3) AI and the Future of the Environment 4) Practical Applications

According to the Environmental Data and Governance Initiative (EDGI), environmental data justice is an emerging framework that is in conservation with data justice movements. In our first section, we will explore the emergence of data justice movements and the connection to environmental data justice through an exploration of questions posed by EDGI, “How can data be critiqued and at the same time used towards more environmentally just futures? How are communities and activists creating new visions of just data infrastructures and projects even as they critique the discriminatory uses of data? These questions will be explored through both domestic and international lenses. We will then analyze the ways in which policy decisions influenced by data analyses are impacted by human bias, political and social context.

As AI advances, how will biases built into models impact the future of environmental and climate justice? Our section on AI and the environment will explore concerns raised by futurists about the impact of human decision on AI and the environment. Finally, we will explore current ideas about best practices for data collection and analysis to reduce bias.
Grades:

- Assignments Blog Posts or Podcast: 50%
- Discussion participation: 35%
- Discussion Questions: 15%

**Discussion Questions** (15% total): Each week you are required to write one critical discussion question in response to one of the reading assignments. (i.e. a response to one of the assigned articles) Analyze key ideas and pose questions and ideas. You may also reference other literature in the course or relevant outside reading.

The discussion questions need to be submitted via the appropriate link on GauchoSpace no later than 12:00 pm each Monday.

**Participation:**
You must be prepared to participate in class discussion (both small-group and whole class discussion). This requires keeping up with the readings as indicated on the syllabus. Participation includes paying attention, taking notes, answering my questions, asking your own questions, participating in group work and discussions, and offering your critiques or response to the readings. It also helps me to know which parts of the readings or lectures you may have difficulty understanding. Because what we will discuss are more than just theoretical concepts, I incorporate both class and small-group discussions often in our lectures, relating our course topics to current events and everyday experiences. The success of this course also depends on the quality of your preparation and participation.

**Blog Posts or Podcast:** Instructions regarding Blog Posts and Podcasts can be found in a separate document in GauchoSpace

**GRADING**
Your final grade will be based on your performance of the course requirements above. Each of the requirements (except for class attendance) will receive a grade according to the following criteria:
A Outstanding work. Written work or podcast is accurate, clear, rigorous, and shows evidence of effort as well as careful attention to detail. Verbal contributions are thoughtful and consistent.
B Solid work. Written work or podcast is accurate and clear. Verbal contributions are frequent, articulate, and thoughtful.
C Mediocre work. Written work or podcast have some problems. Verbal contributions are occasional or occasionally thoughtless.
D Substandard work. Written work or podcast has many mistakes, is hard to follow, and does not show evidence of careful attention to the assignment. Verbal contributions are infrequent and/or thoughtless.
F Failure. Written work or podcast is incomplete, unintelligible, rife with mistakes, or not turned in at all. Verbal contributions are not made.

**GRADING SCALE:** Grading is based on a 100-point scale.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97</td>
</tr>
<tr>
<td>A</td>
<td>93</td>
</tr>
<tr>
<td>A-</td>
<td>90</td>
</tr>
<tr>
<td>B+</td>
<td>87</td>
</tr>
<tr>
<td>B</td>
<td>83</td>
</tr>
<tr>
<td>B-</td>
<td>80</td>
</tr>
<tr>
<td>C+</td>
<td>77</td>
</tr>
<tr>
<td>C</td>
<td>73</td>
</tr>
<tr>
<td>C-</td>
<td>70</td>
</tr>
<tr>
<td>D+</td>
<td>67</td>
</tr>
<tr>
<td>D</td>
<td>63</td>
</tr>
<tr>
<td>D-</td>
<td>60</td>
</tr>
<tr>
<td>F</td>
<td>less than 60</td>
</tr>
</tbody>
</table>

**ABSENCE AND ATTENDANCE POLICY:**
Because of the context in which we find ourselves, you are allowed 3 absences before your grade is negatively affected. Please inform me via email of any anticipated absences as soon as possible. Excused absences are at my discretion, and require appropriate documentation. In addition, if you have a COVID-19-related issue (i.e. exposure to COVID-19, testing positive, experiencing COVID-19 related symptoms, etc.), please let me or the TA know as soon as possible so we can accommodate you as appropriate.

It is your responsibility to make the necessary arrangements for any missed assignments, etc., and get notes from a classmate or alternative source, as I will not provide this material to you. Please do NOT email me asking what you missed in class or whether or not we did anything important in a class you missed.

**Statement re Technology:** If you have technology access issues that are making it difficult for you to complete your coursework please email me. We will work with you to make the course accessible to you. There are multiple sources of help at https://keeplearning.id.ucsb.edu

Other specific sources can be found as follows:
• EveryoneOn.org to find resources locally. Enter your zip code and learn about low-cost internet access and computers in your area.
• If you need help troubleshooting problems with your technology during the quarter, contact the Collaborate Help Desk (available at the keep learning site above).
• If your technology breaks the Office of Financial Aid and Scholarships may be able to help cover the costs of repair.

Use of copyrighted course materials: I am the exclusive owner of the copyright in those materials I create. You are not allowed to take photos of any curricular materials, including PowerPoint slides. Sharing PowerPoint slides, video recordings, or other materials without my explicit permission is NOT allowed. This is very important to me. This is protected by both university policy and U.S. copyright law. Such materials include the lectures, notes, and other material presented in class or as part of the course. Students enrolled in this course are permitted to take notes, which they may use for individual/group study or for other non-commercial purposes reasonably arising from enrollment in the course or the University generally. No individual is permitted to share, sell, or otherwise barter notes or any other course materials, either to other students or to any commercial concern. Any violations of this policy will be reported to the Vice Chancellor for Student Affairs.

UNIVERSITY POLICIES:
Students are expected to operate under policies as stated under Student Conduct and Responsibility in the University catalog (https://my.sa.ucsb.edu/catalog/Current/Index.aspx)

Academic Dishonesty:
Issues of cheating, etc. are taken very seriously, both by me and the university. Academic dishonesty will not be tolerated. I fully expect you to do your own work. I expect that what you turn in will be written solely by you for the purpose of this course and will be unique from that of your classmates. Students who attempt to pass off the work of others as their own or assist others in doing so will receive no points for the work and will be subjected to disciplinary action set forth by the university. Any violation of course policies as it relates to academic integrity will result minimally in a failing or zero grade for that particular assignment, and at my discretion may result in a failing grade for the course. Incidents of academic misconduct in this course will be referred to the Office of Judicial Affairs for review at the university level. More information about university policies can be found here: http://judicialaffairs.sa.ucsb.edu/AcademicIntegrity.aspx.

Non-Discrimination Policy:
All students have the right to learn and participate in a classroom environment free of intimidation, harassment, and discrimination based on characteristics such as gender, race, age, sexual orientation, disability, religious or political beliefs and
affiliations. I will address any related issues that surface immediately; please help me to cultivate a positive classroom environment by communicating any concerns that you have.

Statement on Gender and Sex Discrimination and Sexual Harassment:
Under Title IX, university students are protected from harassment and discrimination based on gender and sex. If you feel uncomfortable or in need of support at any time related to your gender, sex, and/or sexual orientation, please contact either me or your TA immediately. If you would like to disclose information related to pronouns, name changes, or identities, I encourage you to do so. UCSB’s Resource Center for Sexual and Gender Diversity on the 3rd floor of the Student Resource Building is also available to be of support students. UCSB does not tolerate sexual harassment/sexual violence, which is prohibited by University policy and state and federal law. The Title IX Compliance and Sexual Harassment Policy Compliance Office (TIX/SHPC) aids in preventing and resolving and investigating complaints of sexual harassment/sexual violence and gender discrimination. (https://oeosh.ucsb.edu/titleix/).

Mandatory Reporting:
One of my responsibilities is to help create a safe learning environment on our campus. I want to ensure that students feel they can speak to me, but I also want students to be informed that I have a mandatory reporting responsibility related to my role as a professor. I am *required* to share information regarding sexual misconduct or information about a crime that may have occurred on UCSB’s campus or in the community. A result of my mandated report will be that students will receive outreach and resources from the campus Title IX office. Students may speak to someone confidentially by contacting CARE, Campus Advocacy, Resources & Education at the 24/7 advocacy line at (805) 893-4613 or visit them in person at the Student Resource Building.

Inclusivity of All Students Regardless of Citizenship
The University of California system publicly supports all students regardless of immigration status. If you feel that you need any kind of assistance as you are affected by either your immigration status or that of a loved one, please contact UCSB Dream Scholars/Undocumented Student Services (http://www.sa.ucsb.edu/dreamscholars/home).

Students with Disabilities:
If you have a disability, or other medical condition, that requires special academic accommodation, please make an appointment to speak with me within the first 3 weeks of the quarter in order to discuss any adjustments. It is important that we
talk about this at the beginning of the quarter. It is the student's responsibility to notify the Disability Students Program (https://dsp.sa.ucsb.edu/home) of any condition that may require accommodations. Do NOT wait until the last minute to let me know of any needed accommodations, including any accommodations needed for exams.

Campus Services:
Please use the following link to find support services available to you: http://oic.id.ucsb.edu/getting-started-ucsb/campus-services

Additional student resources

The text below is provided by the UCSB Disabled Students Program.

Counseling and Psychological Services (CAPS). As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. CAPS is available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus. They can be reached by phone at 805.893.4411, or online at http://caps.sa.ucsb.edu. The CAPS building is the pink building next to the Humanities and Social Science building (HSSB)

Food insecurity: http://food.ucsb.edu/ includes the Cal Fresh Program http://food.ucsb.edu/calfresh and the Associated Students food bank https://foodbank.as.ucsb.edu

Resource Center for Sexual and Gender Diversity (RCSGD) in the SRB, offers a host of services for LGBTQI+ students including a library and many events throughout the year. http://rcsgd.sa.ucsb.edu/

Campus Learning Assistance Services (CLAS) helps students grow academically by offering workshops, walk-in and pre-scheduled tutoring, and writing help both for
native and non-native (ESL) English as a second language speakers. Over 50% of students will stop by CLAS at one time or another. http://clas.sa.ucsb.edu

**Student Resource Building (SRB)** houses many campus resources offices, including the African Diasporic Cultural resource Center, the American Indian Resource Center, the Asian Resource Center, the Middle Eastern Resource Center, the Non-Traditional and Re-Entry Student Resource Center.
http://www.sa.ucsb.edu/student-resource-building/home

**Multicultural Center (MCC)**, located in UCEN, hosts a wide variety of cultural events and educational programming throughout the year, including film showings, lectures, musical performances, and more: http://mcc.sa.ucsb.edu/

**Campus Advocacy, Resources, & Education (CARE)** offers 24/7 confidential support and advocacy in situations of sexual assault, dating and domestic violence, and stalking. Located in the SRB, they can be reached at 805.893.4613 or http://wgse.sa.ucsb.edu/care/home

**Financial Crisis Response Team**: If you are experiencing issues of housing insecurity contact the Financial Crisis Response Team at financialcrisis@sa.ucsb.edu to begin application for assistance.

**Health and Wellness**: Student well-being is integral to academic success, student development, and life satisfaction. On this website, students will find links to a range of services related to well-being such as: assistance with basic needs (food, housing, finances); counseling and physical health resources, daily wellness centers and programs; social connection, and personal safety. https://wellbeing.ucsb.edu/

**COURSE OUTLINE**: This syllabus is subject to change and additional articles and media items might be added. Students are responsible for paying attention to GauchoSpace and emails from the professor regarding any last-minute changes. All materials will be on GauchoSpace
Foundations of Ethics and Bias, Race, and Environmental Data Justice

October 2
Introduction to Ethics and Bias in Data/Data Justice
  - What is data? History of data collection and its discontents

Reading:

October 9
  - Data Justice and Environmental Data Justice: Review of organizations

Reading:

October 16
  - Indigenous perspectives on Data and Data Sovereignty

Reading:
Data and Policy

**October 23**

Reading:

**October 30**
- **U.S. Military and Climate Data**

Reading:
  Read Chapter 3&4. Pgs. 103-177

**November 6**
- **Citizen Science**

Reading:

**AI and the Future of the Environment**

**November 13**

Reading:
**November 20**
Reading:
- *The Necessity of an Ecocentric Environmental Ethic for Artificial Intelligence*
- *Creating Trustworthy AI for the Environment: Transparency, Bias, and Beneficial Use - Markkula Center for Applied Ethics*

**Practical Applications**

**November 27**
In class: Al Blindspot Exercises
- 📝 Exercise: AI + Algorithms
No Reading

**December 4**
In class:
Final Discussion/Review

**December 11**
Final Project Due