Data for Good

Spring 2022

Instructor	Email	Office Hours
Professor Herzog	Canvas Inbox	Mondays 12p-2p; Fridays 1p-2p

Course Description

How can data be harnessed for good? This is a class about how to use analytics to help humanity, engage communities, improve nonprofit impacts, invest grant dollars strategically, and share data ethically and equitably with the producers of this treasured resource: everyday people. Students will hone their data literacy skills by learning to read a variety of data forms, understanding their significance for lessening complex social problems, and critically considering their unintended consequences. A key aspect of the course is attention to data visualization: the ability to tell compelling stories with data that improve society and help communities to flourish.

Student Learning Objectives

• Comprehend, interpret, assess, and apply data

• Synthesize complex data from multiple sources

• Think critically about social implications of data

• Engage data for organizational decision-making

• Evaluate data and technology advancements

• Analyze size and scope of funding for data tech.

• Communicate data ethics, justice, equity, sharing

• Visualize data and tell compelling data narratives

Growth Mindset

This class will support your growth in learning new domains. A person with a growth mindset believes that they can learn (even when it is difficult) and that the key to learning is putting in effort. Learning is viewed as worthwhile, and enjoyable, even when it can sometimes be frustrating or challenging. I will do my best to support your growth mindset in our class, and I encourage you to do the same.

Required Materials

All readings are posted in Canvas for electronic viewing and/or download. The reading files are all available in the Files menu section labeled Readings, organized in module folders. Each module also hyperlinks to the readings due within that module. Students are responsible for accessing all readings.

Regular Canvas Use

This course relies upon regular usage of the Canvas course space. Students are responsible for regularly checking – *at least once or twice per week* – for updated materials, instructions, and course requirements. Since this the Canvas space is so important to success in this class, students who do not regularly interact on Canvas can be administratively dropped from the course.

Classroom and Online Etiquette

Our online classroom is an academic community that values and welcomes new and different perspectives. In the conversations that we engage in during the course of the semester, difference and diversity are especially respected and valued. While traditions, inherited wisdom, and common understandings are important to civic life, innovation and difference provide a crucial impetus for growth. Please include your classmates in our discussions and be open to what they have to say.

Civility, tolerance of difference, and freedom of expression are fundamental values in philanthropy. At times, civility requires that you be quiet and listen to the voice of others; at other times, civility requires that you speak up and advocate for yourself or others (online too). It is expected that all online class discussions will be civil. For some who contribute often, this means that you will sometimes need to be cognizant of the need to step back and let others contribute. For others, this means sometimes you will need to challenge yourself to speak up, even if it feels uncomfortable.

Course Schedule

Module	Topic	Readings	Exercises
Module 1	Data Decisions	Maclaughlin 2016; Bixler et al. 2018; Stobierski 2019; Public Profit 2014; UN SDGs 2020	Class Introductions
Module 2	Data Domains	Specific to selected domain (see Canvas)	Domain Reflection
Module 3	Data Revolutions	Aoun 2017; Pearl & Mackenzie 2018; O'Neil 2016; Desouza & Smith 2014; Wallace 2016; 2018; Koenig 2016	Changes Discussion
Module 4	Data Funding	Rockefeller Foundation 2020; OpenPhil 2020; Chronicle of Philanthropy 2020; GuideStar	Funding Analysis
Module 5	Data Justice	Vosoloo et al. 2020; Sadowski 2019; Metcalf & Crawford 2016; Sanches 2016; Baack 2015	Justice Discussion
Module 6	Data Ethics	Moss & Metcalf 2020; Deon 2020; We All Count 2020; Chicago Beyond 2020; Haven & boyd 2020	Ethical Framework
Module 7	Data Literacy	Chetty 2019; Markow et al. 2017; Schuff 2018; Shusterman 2020; Herzog 2019; Salganik 2018	Data Literacy Quiz
Module 8	Data Visualizations	Munzner 2014; Data Visualization Examples	Data Visualization
Module 9	Data Storytelling	Knaflic 2015; Dykes 2019; Rayson 2016	Data Narration
Module 10	Data Philanthropy	Oldenburg 2020; BrightHive 2020; Smith 2019; Benjamins 2016; Oldenburg 2020	Data Agreement
Final Project	Data for Good	Good Tech Fest 2021; Big Data & Society	Present or Write

Assignment Schedule

Date	Assignment	Brief Description (Read Instructions on Canvas for More Details)
Jan 25	Class Introductions	Share a brief video with your name, year in program, and your interests in data
Feb 01	Domain Reflection	Select one domain and write a reflection about data affecting this domain
Feb 08	Change Discussion	Post/reply in discussion board what excites and worries you about data changes
Feb 15	Funding Analysis	Analyze size and scope of A.I., machine learning, and data science philanthropy
Mar 01	Justice Discussion	Post/reply in discussion board what inspires or disgusts in data justice examples
Mar 08	Ethical Framework	Analyze existing code of ethics, ethics frameworks for what value, what missing
Mar 15	Data Literacy Quiz	Quiz to assess your data literacy skills; with option to resubmit to improve score
Apr 05	Data Visualization	Post/reply in discussion board DataViz analysis: what is and/or is not effective
Apr 12	Data Narration	Create a doodle video with data narration; Post/reply in discussion board
Apr 19	Data Agreement	Write a data sharing agreement for selected domain; Group option available
May 05	Present or Write	(a) Present video application of M1-M10, *or* (b) Write paper application of M1-10

Each module (M1-M10) and the final project have 50 points possible, totaling to 550 possible points. Modules are intended to be completed sequentially. Make-up weeks facilitate catching up on earlier assignments before progressing to later synthesizing assignments. Students can elect to write a data agreement as a group or individually, and the final project is either a presentation or paper format.

Module Overviews

Module 1

In this module, we will discuss the ways that data science can be used for good. Data for good is an actionable and dynamic area that focuses in particular on the ways that data are engaged make and enact informed decisions. For example, data can be employed to measure intended and positive social impacts, as well as to assess unintended consequences of philanthropic actions. As a result, decisions can be made about what features of an organization or program to keep, and which to change.

Module 2

In this module, we will focus on a set of domains in which data analytics can be applied. Each of those domains can and is already improved by the use of data, and technological advancements in data science are and will continue to enhance the ways that data can be employed in each domain (this is the focus of Module 3). Despite data being universal in its applicability across these domains, it is helpful at this point in the semester to delve into a specific domain that will form the basis of your application context throughout the semester (this is explained further in the Module 2 assignment instructions).

Module 3

In this module, we will focus on how new technology – such as artificial intelligence, machine learning, and data science – is scaling up the size of data, its availability, and its impact. The readings describe four interrelated revolutions: technological, causal, computational, and data. AI for good is only quality in the extent to which the data it is dependent upon has been standardized in meaningful and unbiased ways. Several examples illustrate positive social impacts of these revolutions, while also revealing several problems, including unintended consequences and harmful embedded biases.

Module 4

In this module, we will analyze the size and scope of funding for Artificial Intelligence, Machine Learning, and Data Science technology (AIMS Philanthropy). Substantial amounts of philanthropic resources are being invested in AIMS technology, and the goal of this module is for you to gain a better sense for these amounts, the sources of contributions, and examples of the recipient organizations. The module addresses these two questions: How much funding has been invested in AIMS technology? What focus areas, applications, discovery, or other purposes was AIMS-funding directed toward? Alongside the content of the visuals in this module, the mode and approach to the visuals also serves as an introduction for you to the ways that data visualization tools can be engaged to tell compelling stories with data.

Module 5

In this module, we will attend to the data justice issues, some of which were introduced in prior modules. As O'Neil (2016) highlighted in Module 3 - when big data gets it wrong, it gets it wrong in a big way. One of the primary distinctions in big data is the scale, and this applies also to the larger scale of inaccuracies. If Module 5 had a motto, it would be: "when it goes wrong, it goes really wrong." With this context in mind, it is important to evaluate data for good efforts. It would be easy to readily conclude that big data, AI, ML technological advancements are bifurcated into all for the good or all for ill. The reality is more complex.

Data and technology are neither naturally good nor bad. Instead, it is important to situate these as social tools. This is metaphorically similar to how a crowbar can be used to build and contribute to social good, while also having the capacity to be used as a weapon to cause serious harm and even loss of life. Data and technology are also tools, and people can use these tools in meaningful and helpful ways that improve society, or in dangerous, careless, and deeply biased ways that can harm people, cause wars, and further exacerbate entrenched inequalities.

With this context in mind, one of my wishes for you is that you leave this class with a view of the phrase 'data for good' as an action verb. It is not a stasis, a passive description of what is. Rather, it is a charge, a constant work in progress, an intention, an aspiration, and effort that requires dynamic human energy to achieve. Even then, achieved is only descriptive of momentary instances. There is not point at which data have arrived at the good forevermore. As is beautifully said: "Hope is not a strategy for change." To employ data for good, it is necessary to recognize the potential problems and limitations, frame the issue, focus on root causes, disaggregate data whenever possible, be mindful of power and how exercises of power are often embedded within unintended consequences through taken-for-granted norms that were set by statistical majorities. Question the assumptions. Seek better solutions.

Module 6

In this module, we will attend to the ways that data ethics requires conscious acknowledgment of, attention to, and planning surrounding this principle: equity is not a natural process. Equitable distribution of resources, information, and relational capital is not a given. It is not what happens by accident, or when no one is paying attention. To make equity happen requires concerted effort and collaborative engagement. This is also true of data, especially when data is understood as a resource that can be inequitably extracted, accumulated, and redistributed, much like other capitals.

Knowing that working toward data equity requires careful considerations, a primary goal of this module is to analyze data ethical frameworks. There are two readings that provide background to these, and three examples of ethical frameworks. There are some points in common across each of the ethical frameworks, and yet each has its own 'flare' and focus. Thoughtful analysis entails a willingness to see the pros and cons of each approach, to compare and contrast the benefits and limitations of engaging one versus another framework. Ask yourself: What do I value in these? What is missing?

Module 7

In this module, we will attend to examples illustrating the need for data literacy skills, as well as unpack the kinds of skills and capacities included within data literacy. One way to understand the need for a skill is to consider the problems that can arise from its dearth, and thus this module attends to the ways that - if not properly skilled - data analytics can be harmful to people and society in general. That said, there are yet numerous ways in which data analytics can be harnessed to improve the effectiveness, efficiency, and accountability of philanthropic organizations.

Module 8

In this module, we delve deeper into data visualization by reviewing several principles for quality design. We will also cover several examples of data visualizations, including effective designs and less than effective pitfalls. An important punchline of this module is that designing an effective data visual rests heavily on telling a story to a specific audience, and aligning the design strategy with the preferred communication style for that audience. Another important takeaway from this module is that good visual design does not happen by accident. There are many helpful tools that you can engage to ease the visualization process and automate aspects that were formerly cumbersome. That frees you up to be thoughtful, creative, and impactful in the human agency you exercise in making the best design choices for your intended visual story, including engaging visuals to frame the reasons for the story.

Module 9

In this module, we focus on the narrative aspects of data storytelling. This includes reviewing examples of compelling data narratives, storytelling tips, building blocks of data stories, questions that data stories need to answer, moving from data exploration to data explanation, and minimizing data story extraneous load. We also compare and contrast multiple examples of data showing (less effective visuals) versus data storytelling (more effective visuals) based upon the same data. These examples help to highlight the important human agency involved in the data storyteller (you!) making strategic choices about what kind of visual to engage and which design techniques to use, such as which colors, what to highlight with those colors, how to arrange the data, what to exclude from the visual, and how succinct text can be embedded within visuals to insert narrative interpretation within the image.

Module 10

In this module, we focus on data philanthropy: sharing data for public benefit. This module presents answers to the questions: What is data philanthropy? What are examples of data philanthropy? What are the major barriers to wider data sharing? What are principles for data sharing? What are data sharing agreements, and what purposes do they serve? As with other assets, data is a social good that can be hoarded and accumulated by a select few or redistributed and shared broadly in order to benefit the lives of people beyond its creators.

Additional Information and Resources

When Technology Fails

Technology can and does fail. Here is some practical advice:

- If home computer crashes, internet service provider goes down, or there is a documented power outage in the area, use the university's computers to access and submit your work.
- Have a back-up plan in place. Save work on Google Drive or OneDrive (it is free and unlimited), flash drives, and/or email files to self.
- Canvas is down periodically; access may be impossible at that time. Please wait and try later. UITS usually addresses problems immediately and restores service quickly.
- *The key to navigating past technology issues is to submit with plenty of time before due dates.*

Student Responsibility/Technical Difficulties Policy

- Please note that personal technical issues (i.e. computer crashes or lack of knowledge of Canvas) are considered to be the responsibility of the student and will not excuse the student from assignments or other course responsibilities.

Honors Option

Students enrolled in the IUPUI Honors College may pursue "For Honors Credit" as an option in this course, and I am happy to meet with any student interested in this to discuss the options. The Honors Contract, between myself and the student, will include the proposed assignment(s) and timeline for completion, in accordance with the IUPUI Honors College protocol. The faculty member and student both sign the Honors Contract and submit it to the IUPUI Honors College. Students must earn a minimum grade of B in the course to receive honors credit.

Resources

The University Library is your gateway to a wealth of scholarship and sources. In addition to reference librarians, your contact at the Philanthropic Studies Library is Denise Rayman 317 278-2313 or drayman@iupui.edu. To access the library's collection and services, visit here.

The University Writing Center is a free service available to all IUPUI students, faculty, and staff, at both the graduate and undergraduate level. Students can go for help with all kinds of writing assignments and projects. The Writing Center offers students the opportunity to work one-on-one with experienced readers and writers, and can assist students with the development, organization, revision, and editing of written work. For more information or to schedule an appointment, visit here.

Academic Honesty

Academic dishonesty consists of passing off another's ideas, work, writing, exam responses, etc., as your own. Violations include, but are not limited to, cheating on exams, having unauthorized possession of an exam, and submitting the work of another person as your own (aka, plagiarism). Cheating on exams, quizzes, or course assignments is an academic crime. If you cheat, you lessen the value of your own degree, and that of all your classmates. Value your education by respecting yourself and your peers enough to let your work stand on its own. Act with integrity in this class and throughout your academic career. Academic dishonesty will be treated very seriously, reported to the Dean, and can result in marks to academic records and potential expulsions.

Students are required to comply with all University policies regarding academic dishonesty, here, and other issues outlined in the official student rules. As a core part of its mission, IUPUI provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each IUPUI student is required to be familiar with and abide by the University's Academic and Professional Honesty and Integrity Policy. When in doubt about what constitutes academic dishonesty, please ask! Ignorance of this policy is not an excuse for noncompliance. *If you submit an assignment for one class that is substantially the same as an assignment for another class, without prior approval, this also constitutes academic misconduct.*

Americans with Disabilities Policy
The American Disabilities Act (ADA) is a federal antidiscrimination statue that provides comprehensive civil rights protection for persons with disabilities be guaranteed a learning environment that provides for reasonable accommodation. All services, programs, and activities at the University are accessible to students with disabilities. If you have a disability that interferes with your potential success in this course, please inform the instructor during the first week of class so special arrangements can be made. To receive special services, you must be registered with Adaptive Educational Services (AES), here.

Other Accommodations
If you need other assistance, IUPUI's Student Advocate Office can guide you to departments, university policies, and other resources. The office is located in Room 350, Campus Center, and information can be found here. There are also many resources to help maintain health and well-being while a student at IUPUI.

Or, if you are concerned about the health and well-being of someone else (a fellow classmate, roommate, or friend) you can submit a care form or read FAQ's here.

Sexual Misconduct
IUPUI does not tolerate acts of sexual misconduct, including sexual harassment and all forms of sexual violence. If you have experienced sexual misconduct, or know someone who has, the University can help. It is important to know that federal regulations and University policy require faculty to promptly report complaints of potential sexual misconduct known to them to their campus Deputy Title IX Coordinator(s) to ensure that appropriate measures are taken, and resources are made available.

The University will work with you to protect your privacy by sharing information with only those that need to know to ensure the University can respond and assist. If you are seeking help and would like to speak to someone confidentially, you can make an appointment with a Mental Health Counselor on campus. Information is here and reports can be filed here.

Administrative Withdrawal
A basic requirement of this course is that you will participate regularly and conscientiously complete all required course activities and/or assignments. Keep in touch with me if you are unable to attend, participate, or complete an assignment on time. If you miss more than half of the required activities within the first 25% of the semester, you may be administratively withdrawn from this course.

Administrative Withdrawal Example: *This course has 10 assignments (one for each module); thus, if you miss two assignments in the first four weeks of the semester*, you may be administratively withdrawn. If administratively withdrawn, you will receive a notice from the registrar. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and if you are administratively withdrawn from the course you will not be eligible for a tuition refund. Refer to this page for information about important drop, add, withdrawal dates.

Emergency Procedures
Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found here. If you are ever in a situation where you feel there is an immediate need or threat, please always remember to call 911 or our campus police – 317-274-7911. In addition, though we certainly hope we never have to deal with this type of situation, here is a video on what to do in an active shooter situation.

Syllabus Content, Schedule Changes, and Copyrights
The syllabus schedule and content may change at the discretion of the professor. Changes will be announced in class or on Canvas. Students are held to all requirements and expectations in this syllabus, and continued enrollment in the course is understood as agreement with syllabus policies.

Please note that all handouts and supplements used in this course are copyrighted. This includes all materials generated for this class, including but not limited to syllabi, exams, quizzes, in-class materials, and lecture or reading notes. Materials may only be downloaded or photocopied for personal use by students in this class and should not be redistributed.