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Department of Management
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MANAGEMENT 7430

Work and Technology: Choices and Outcomes

Fall 2023 Syllabus

Q2: Tuesday, October 24 – Tuesday, December 5 - 1:45-3:15pm

(version 1.0 – August 31, 2023)

Purpose and Course Description

That technology affects work is a commonplace - but we accept technology's impact too readily as inevitable and unchangeable. This 0.5 CU course challenges the mindset of technological determinism and explores what choice points are available to managers implementing new technologies as well as the engineers who design them.

- Module 1: “Technology and Its Impact on Jobs and Skills” considers which technologies deserve the characterization of “revolutionary” due to their capacity to change entire organizations – and even societies — vs. those that only substitute narrowly for past technologies. We’ll examine past anxieties related to automation and evaluate the extent to which the “worst-case” scenarios about employment loss have or have not come to pass – and evaluate claims of “this time it’s different”.
- Module 2: “Intelligent Technologies: How Will They Affect Work and Organizations?” explores how Artificial Intelligence (AI) is changing core “managing people” activities (e.g., hiring and performance appraisal) – plus shifting the locus of management away from human bosses and into algorithms. We’ll examine controversies around “gig work”, i.e., the positives of worker schedule flexibility vs. the negatives of algorithmic control. We’ll give particular attention to generative AI and its potential to either displace or augment the types of knowledge work that have hitherto been relatively protected from automation – as well as other potential benefits and risks for organizations and individuals. How can we shape choices about the application of this suddenly ubiquitous and powerful technology?
- Module 3: “Technology and Policy” examines three policy issues. First, how can we inject more ethical criteria into the development of artificial intelligence and algorithms affecting work? Second, what are the pros and cons of “universal basic income”, whose premise is that technological change will soon lead to an unprecedented amount of job elimination? Third, how does “technology make us dumber”? How can we avoid the obsolescence of critical human skills? These issues, covered in the course in previous years, take on new dimensions and new urgency given the current (and fast improving) capabilities of AI.

Take this course to be ready to manage the strategic and analytic issues involving the design and implementation of technology at work - and for a preview of your own future work life.

Requirements include: class participation; in-class quizzes; interviewing someone you know to ask how technology has affected their work life; and the “In Hindsight” group assignment looking back on past scares about a particular technology’s impact on work - and what actually happened.

The topics of this course are highly complementary to topics in other Wharton MBA electives in OIDD, Management, and Legal Studies. I hope to attract both students prioritizing the study of organizational/HR topics who want to know more about technology and operations strategies as well as those primarily studying technology and operations who want to understand more about work and employment practices, and the impact on economic and social outcomes for individuals, firms, and societies.

Prerequisites: For Wharton students, it is advantageous but not required to have taken the core MGMT 6110 or 6120 class, which will be helpful in understanding how organizations function in their environment and the context within which firms make strategic decisions as well as the fundamentals of how firms manage human and social capital. **The course is open to non-Wharton students as long as there are still seats available.** Please email me at macduffie@wharton.upenn.edu to let me know why you are interested in taking the course.

Course Requirements

Students will be evaluated on class participation (30%), a group assignment (20%), an individual paper (30%) and in-class quizzes (20%)

- **The group assignment is due, on Canvas, at 11:59pm on Sunday November 12th.**
- **The individual paper is due, on Canvas, at 11:59pm on Friday December 1st.**
- **Quizzes (5) are distributed across the course (dates below).**

Class Participation (30% of your grade)

This course requires a great deal of student involvement. Regular, on-time attendance is the foundation of a strong participation grade. Each class period will include discussion of the topics and issues at hand, both in full (plenary) sessions and in small group breakouts. Students will be graded on the quality of their comments in class, defined as adding substantively to class discussions and linking effectively to others’ comments in the class. (Quantity is also measured but quality is weighted more heavily.) Contributions to discussion can take multiple forms, e.g., speaking up in class after raising one’s hand, responding to a “cold” or “warm” call, or linking to another student’s comment to move the discussion constructively forward. Polls and in-class exercises also count towards participation. I may also set up some discussion boards on Canvas to continue certain conversations from class; posting your contributions there will count as participation based on the same relative weighting of quality over quantity. Across all types, participation constitutes 30% of your grade.

Speaking up in a large group of people can be daunting but it is an important skill to learn. So is listening carefully to others while also planning what one wants to say. We can all improve our ability to make meaningful contributions via better listening and getting better at deciding when and how to speak. If you have concerns about your level of participation, please speak to me as early in the course as possible. That will give us time to figure out ways to help you participate more fully – and potentially in more different ways.

Group Assignment (20% of your grade)

In Hindsight is a small-group assignment in which **you research a past technology** (*i.e., not brand-new and/or barely implemented*) to report on the hopes and fears accompanying its introduction into the workplace or the economy more generally, and to assess (with the benefit of 20/20 vision looking back) the extent to which those hopes and fears were borne out – and, in addition, what unanticipated surprises occurred, for better or worse. You will be assigned randomly to groups with 2-3 members.

Your report will take the form of a PechaKucha – a format developed to encourage new ways of sharing content and stimulating conversation. PechaKucha's 20x20 presentation format consists of 20 chosen images, each shown for 20 seconds. In other words, you've got 400 seconds (6 minutes and 40 seconds) to tell your story, with visuals guiding the way. (PechaKucha means "chit chat" in Japanese.) **I must approve your choice of technology, via email.** Your PechaKucha can be put together quite simply; think of a PowerPoint presentation with timed slide advances and pre-recorded voice-over narration. Ample online resources are available; I will steer you to them. **The PechaKucha is due at 11:59pm on Sunday November 12th, posted on Canvas.**

Individual Paper (30% of your grade)

You will write an individual paper linked to the first two modules. For this paper, you will interview a relative, friend, or other person that you encounter frequently in your life at Penn, asking about a job that person has had (current or past) which has been significantly affected by technology of some kind (old or new; mechanical or digital; hardware or software; in the workplace or when working remotely). I will provide you with a general interview protocol, tips on how to select an interview subject, and training on how to approach the interview, which should last no less than 30 minutes and no more than 60 minutes. I will also provide guidance on how to structure the paper in which you write up what you learn during this interview. For a top score, you will draw upon the topics, themes, and concepts of the first two course modules in writing up your observations and reflections. **This paper is due at 11:59pm on Friday December 1st, posted on Canvas.**

In-class Quizzes – (20% of your grade)

In multiple classes, you will take an in-class quiz on Canvas to assess your absorption and comprehension of the materials assigned for that day (readings, videos, lecture slides). The quizzes will be short (10 minutes at the end of class) and consist entirely of multiple-choice questions; each short quiz will constitute 4% of your final grade for a total of 20%. **Quizzes will be given in classes 2, 4, 5, 7, and 9.** Scores will be posted on Canvas.

Teaching Assistants

The "in-class" TA will be a student who took this course in the past, while grading will be done by a PhD student, both TBD.

Required Readings and Media

Readings include excerpts of articles from professional and academic journals, long-form journalism, short newspaper or web articles, and chapters from books. In addition, video segments (short or portions of longer videos) are assigned for some class sessions.

We will use Canvas for courseware support. The syllabus, course slides, and detailed assignment descriptions will be posted there. All articles and book chapters will be in a coursepack provided via Study.Net. Videos in the syllabus are directly hyperlinked from each assignment (Assignments tab) in Canvas.

You will turn in assignments (individual and team) by uploading your papers to Canvas, and I will return grades and comments to you electronically. Groups for the Pecha Kucha assignment and in-class discussions will be created randomly; you will find your group assignment, when the course begins, on Canvas at the “People” tab. Finally, I will create topics for discussion occasionally on Canvas at the Discussions tab; these provide additional opportunities for participation.

Office Hours

These meetings are “to be arranged” – just contact me by email. We can meet in person, at my office (3105 SHDH), or on Zoom, accessed via a link on Canvas.

Policy on Generative AI

This issue is so central to the course content that I am still investigating and deliberating over the best choice of policy. Watch for updates in this space in future versions of the syllabus.

Academic Integrity

Please read and familiarize yourself with Penn’s Code of Student Conduct and Code of Academic Integrity: <https://catalog.upenn.edu/pennbook/>. Regarding academic dishonesty, please note that plagiarism is not limited to copying an entire paper. Using quotes without properly citing them or using ideas without acknowledging their source also constitute plagiarism. Any form of cheating or plagiarism will result in disciplinary action.

Student Disabilities Services and Accommodations for Students with Disabilities

The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the office of Student Disabilities Services (SDS): <https://www.vpul.upenn.edu/lrc/sds/>. Please make an appointment to meet with me as soon as possible in order to discuss your needs and accommodations. If you would like to request accommodations or have questions, you can make an appointment by calling (215) 573-9235. The office is located in the Weingarten Learning Resources Center at Stouffer Commons 3702 Spruce Street, Suite 300. All services are confidential.

Other Accommodations

Student athletes, parents and caregivers, and others whose commitments might affect their ability to attend class or complete assignments on time should also speak with me at the beginning of the semester about potential conflicts. You should also speak with me as soon as possible if religious holidays that occur during the semester will require you to miss class. If you unexpectedly experience a life event that presents you with academic difficulties, I can refer you to CaseNet to ensure that you get the support you need: <https://www.college.upenn.edu/casenet>.

Academic Resources

Penn students are extremely fortunate to have access to an extensive network of academic resources. A majority of Penn students take advantage of one or more of these resources during their college careers, and I strongly encourage you to do so as well. The Office of Learning Resources provides professional consultation services in university relevant skills such as academic reading, writing, study strategies, and time management. PENNCAP supports the success of a diverse group of academically-talented students, many from low-income and first-generation backgrounds. The Tutoring Center offers Penn undergraduate students free, accessible, and convenient options to supplement their academic experience. For more information, visit <https://www.upenn.edu/programs/acadsupport>.

Additional Writing Resources

The Marks Family Writing Center operates under the assumption that all writers, regardless of their experience and abilities, benefit from informed, individualized, and personal feedback on their writing. The program's professional staff and trained peer specialists work with writers engaged in any stage of the writing process—from brainstorming paper topics, to formulating and organizing arguments, to developing editing skills. Appointments and drop-in hours are available. For more information, visit <http://writing.upenn.edu/critical/wc/>. (You will find navigation options when you mouse over “Marks Family Writing Center” on the menu bar.)

Well-Being, Stress Management, & Mental Health

If you (or someone you know) are experiencing personal, academic, or relationship problems and would like someone to talk to, reach out to Counseling and Psychological Services (CAPS) on campus. For more information about CAPS services, visit: <https://www.vpul.upenn.edu/caps/about.php>.

MANAGEMENT 7430: WORK AND TECHNOLOGY
FALL 2023
COURSE OUTLINE

**(All Course Materials Reachable Through Canvas: Readings Accessed Through Study.Net;
Videos Hyper-Linked from Specific Sessions at the Assignment tab)**

Tuesday, October 24

Session 1: Introduction

How should we gauge the scale of impact of a new technology on work? Distinguishing *infrastructural* and *substitutive* technological change. The power of ideas: Taylorism, then and now. Policy dilemmas spurred by new technologies. Course design, assignments, participation.

Readings and Media:

1. Stephen Barley, "What Is a Technological Revolution?" from *Work and Technological Change* 2020, pp. 1-16.
2. "Digital Taylorism," *The Economist*, Sept 10, 2015.
3. Davide Castelvecchi, "Is facial recognition too biased to be let loose?" *Nature*, 2020.

MODULE 1: Technology and Its Impact on Jobs and Skills

Thursday, October 26

Quiz #1

Session 2: What Types of Technology Are We Considering? Why Fear Their Impact?

New technologies at work are often accompanied by both hopes and fears. Is the latest wave of automation and ubiquitous computing going to free individuals to be more creative at work and able to experience new and more fulfilling jobs? Or will these technologies make work worse – more routinized, less autonomous, less creative – whenever they aren't actually putting people out of work by eliminating jobs? What expected outcomes of new technologies tend to happen? What unexpected outcomes occur? How can we assess their relative magnitude and impact?

TECH VIGNETTE: The Luddites

1. "When Robots Take All of Our Jobs, Remember the Luddites," Clive Thompson, *Smithsonian Magazine*, January 2017.
2. David Autor, "Why Are There Still So Many Jobs? The History and Future of Workplace Automation and Anxiety," MIT Initiative on the Digital Economy, May 2017.

Was the Luddites' fight idiotic, ill-informed, ill-advised? Sensible and/or comprehensible? Would you have sided with them or against them? Have you observed or sensed Luddite-like thoughts or actions "closer to home" in time and space? How can past examples of technological innovations and their impact on jobs and skills guide our forecasts for present and future technologies? How does technology's impact compare with other forces affecting employment?

Readings and Media:

1. Erica Groshen, John Paul MacDuffie, Susan Helper, "Labor market impacts from past innovations" and "Implications of past changes" from *Preparing U.S. Workers and Employers for an Autonomous Vehicle Future*, 2018, pp. 13-25.
2. Robert Gordon, "The death of innovation, the end of growth", TED talk, [6:00-12:00]

Tuesday, October 31

Session 3: Comparing Scenarios of How Robots Will Affect Jobs and Skills: Past to Future

Depending on their scope of analysis, assumptions and methods, different analysts can draw dramatically different conclusions about how a given technology will affect jobs and skills. We do a deep dive into robots to illuminate these different scenarios and critically evaluate them, drawing on perspectives from this entire module. Of particular interest: sector-wide economic impact of robots for adopters and non-adopters; AI-enabled robots making progress at difficult-to-automate tasks like grasping objects of different sizes; and “cobots” (collaborative robots) that “share” jobs with humans via each doing tasks that fit their capabilities well.

Readings and Media:

1. Talk by Martin Ford, author of “Rise of the Robots: Technology and the Threat of a Jobless Future” [17:52], October 27, 2015.
2. Lynn Wu, “The Robots Are Coming: Is Your Firm Ready?” Knowledge@Wharton, 6/21.
3. Will Knight, “This Is How the Robot Uprising Finally Begins,” *MIT Technology Review* 121 (4), June 2018.
4. Peggy Hollinger, “Meet the cobots: humans and robots together on the factory floor,” *Financial Times*, May 5, 2016.

Thursday, November 2 Quiz #2

Session 4: Technology, Skills, and Wages - Skill-Biased vs. Task-Biased Perspectives

A dominant hypothesis in recent decades on the different rates of earnings increase for individuals doing different types of work is skill-biased technological change (SBTC), i.e. that jobs affected by automation that can replace low-skilled workers are fewer in number and lower paid whereas jobs affected by automation that complements higher-skilled workers have grown in number and are higher paid. A competing hypothesis is “task-biased technological change” (TBTC) that shifts the focus to jobs and the skills that they demand. Jobs bundle tasks together and can have varied designs based on different combinations of tasks. Automation rarely affects an entire job, rather it affects tasks within jobs; it may completely replace humans for some tasks while only partially affecting other tasks, requiring a continued, complementary human role. Proponents of TBTC argue that it captures the actual process of automation more accurately than SBTC – plus it highlights choice points for engineers and managers in where and how to automate tasks within the context of a job that combines human and automated inputs.

TECH VIGNETTE: Trucking: Driverless, Automated, etc.

- Why is the automation of this one particular job—the truck driver—so momentous?
- Is this an example of skill-biased or task-biased technological change?

Readings and Media:

1. “The Future of Work Looks Like a UPS Truck,” Planet Money, May 2, 2014. [13:54] (L)
2. David Autor, “The Work of the Future: Shaping Technology and Institutions.” Talk at UBS Center, December 2, 2019 [0:45-19:00]
3. David Autor, Frank Levy, and Richard J. Murnane. “Upstairs, Downstairs: Computers and Skills on Two Floors of a Large Bank.” 2002. *Industrial and Labor Relations Review* 55(3): 432-447.

MODULE 2: Intelligent Technologies: How Will They Affect Work and Organizations?

Tuesday, November 7

Quiz #3

Session 5: “This Time It’s Different”: What Distinguishes Artificial Intelligence (AI) and Machine Learning (ML) from Past Technologies?

Benedict Evans: “Machine learning lets us find patterns or structures in data that are implicit and probabilistic (hence ‘inferred’) rather than explicit, that previously only people and not computers could find. They address a class of questions that were previously ‘hard for computers and easy for people’, or, perhaps more usefully, ‘hard for people to describe to computers’. [We don’t] yet have a settled sense of quite what machine learning means ... for tech companies or the broader economy, how to think structurally about what new things it could enable, what it means for the rest of us, and what important problems it might actually be able to solve.”

TECH VIGNETTE: Wordsmith: [“explainer”](#); [real estate](#); [news stories](#); [website](#) (F)

Based on what this technology does well, do you expect professional writing jobs will disappear, or will they evolve? If you think some jobs may disappear, consider which jobs are most threatened. If you expect them to evolve, consider precisely in what ways they might do so.

Readings and Media:

1. “Ways to Think about Machine Learning,” Benedict Evans, 2018.
2. Cathy O’Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, Chapter 1, “Bomb Parts,” 2016, pp. 16-31.
3. Stephen Barley, “Current Thinking on Intelligent Technology, Work, and Employment,” from *Work and Technological Change*, 2020, pp. 69-79.

Thursday, November 9

Session 6: Flexible Schedules and Micro-Monitoring

New management methods affecting when and how hard we work: How new technological capabilities tempt managers to optimize human labor supply to be “on demand”. How schedule optimization software adds to the precarity of low-wage work. When “gamification” adds fun and challenge to the work day – and when it doesn’t. How tech-enabled keystroke monitoring and process control undermine the autonomy and outcome control premises of contract work. What it means when robots become part of the monitoring scene.

Readings and Media:

1. Peter Cappelli, “Stop Overengineering People Management,” *Harvard Business Review*, September-October 2020.
2. Cathy O’Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*, Chapter 7, “Sweating Bullets: On the Job,” 2016, pp. 123-134.
3. Sue Shellenbarger, “Work at Home? Your Employer May Be Watching,” *Wall Street Journal*, July 30, 2008.

**** Group Assignment (PechaKucha) Due
at 11:59pm on Sunday November 12th posted on Canvas ****

Tuesday, November 14

Quiz #4

Session 7: Gig Economy and Algorithmic Management

How modern labor contracting modes are evolving in relation to changes in corporate governance. Resemblance between the new modes and pre-industrial arrangements, e.g. the “putting-out” system of piecework at home. How trends towards “flexible labor” intersect with digital platforms to yield the “gig economy”. What are the varied motivations of “gig economy” workers? How much is choice and how much is necessity? Why does that matter?

TECH VIGNETTE: [Task Rabbit](#) (F)

- Under what circumstances would you choose to become a Tasker?
- Suppose one could develop a great reputation as a Tasker, enough so to reliably earn enough to eat, pay rent, etc. How would this bundle of tasks—performing dozens of different duties for different customers each week—differ from a conventional job?
- If you, as a customer, had the choice between a handyperson who regularly did a variety of household tasks for you or hiring a Tasker who would be different for every job, what would you choose? What would affect your choices?

Readings and Media:

1. Aurelien Acquier, “Uberization meets Organizational Theory: Platform capitalism and the rebirth of the putting-out system,” in *Cambridge Handbook on Law and Regulation of the Sharing Economy*, 2018, (excerpt), sections 1 and 2, pp. 5-12)
2. Lindsey Cameron, “‘Making Out’ While Driving: Relational and Efficiency Games in the Gig Economy,” (excerpt), *Organization Science*, pp. 2-4, 10-15, 17-35.

Thursday, November 16

Session 8: Adapting Practices, Policies, & Strategies for the Hybrid Work Era

While the world has discovered how many knowledge tasks can be undertaken and completed via technology-mediation during “work from home”, certain core experiences of being an employee are challenging to re-create without the opportunity for face-to-face social interaction and one-on-one communication. We will consider the challenges of hybrid work, which many employees prefer and can be important for attracting and retaining talent, yet which also presents new challenges for employee engagement, effective communication and coordination, fostering collective creativity, and keeping the organization’s culture strong. We will also consider the dilemma of how to keep virtual team members feeling connected with each other – and the problem of loneliness. Finally, we flip to look at the opportunities of virtual work, not just from home but from “anywhere”, i.e. the freedom to live and work where you like. Where HR practices and policies have already changed, we also consider the strategic implications.

Readings and Media:

1. Martine Haas, “5 Challenges of Hybrid Work – and How To Overcome Them,” *Harvard Business Review*, February 2022.
2. Constance N. Hadley and Mark Mortensen, “Are Your Team Members Lonely?” *Sloan Management Review*, December 2020.
3. Pritharaj Choudhury, “Our Work-from-Anywhere Future,” *Harvard Business Review*, November-December 2020.

Tuesday, November 21 Quiz #5

Session 9: Generative AI – Displacing or Augmenting Human Knowledge Work?

Will Generative AI be the technology that accelerates past technological and economic trends that have hollowed out the middle class in many advanced economies by undermining and eliminating knowledge work jobs, displacing workers, and damaging communities while exacerbating existing inequality? Or could Generative AI provide a counterweight by giving new tools to people without a college education that enables doing more advanced knowledge work, along with higher wages and the potential to close wage gaps? We take on the central course theme of “challenging the mindset of technological determinism and exploring choice points” with respect to this technology which really may be different from past automation.

Readings and Media:

1. Financial Times, "We have a real design choice about how we deploy AI", interview with David Autor, 8/23/23.
2. Ethan Mollick, “Now is the time for grimoires,” One Useful Thing blog, 8/20/23.
3. Shakked Noy and Whitney Zhang, “Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence,” MIT Working Paper, 3/10/23.
4. McKinsey Quarterly, “The economic potential of generative AI: The next productivity frontier,” excerpts, 8/14/23.

MODULE 3: Technology and Policy

Tuesday, November 28

Session 10: Ethics of Algorithms and Artificial Intelligence

TECH VIGNETTE: Amazon Doesn’t Consider the Race of Its Customers: Should It?

When an application of AI has unintended positive or negative consequences for different groups of people, constituting *de facto* bias or discrimination, who has the responsibility to identify, evaluate, and address (e.g., via more transparency or changes in the algorithm/AI code) those consequences? Consider Amazon’s roll-out of its Same-Day-Prime-Delivery service.

Readings and Media:

1. Video: “Automating Inequality,” Interview with Virginia Eubanks, author of *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. PBS’s *The Open Mind*. Originally aired January 16, 2018. [20:25]
2. Karen Hao, “This Is How AI Bias Really Happens—and Why It’s So Hard to Fix.” *MIT Technology Review*, February 4, 2019.
3. Matthew Hutson, “Who Should Stop Unethical A.I.?” *New Yorker*, February 16, 2021.

Thursday, November 30

Session 11: Technology-Driven Inequality and Universal Basic Income (UBI)

The idea that technological change can drive mass unemployment and require governments to subsidize basic living expenses for many of its citizens is not new, arising in each era when automation scares arise. Proponents of such policies also see benefits in unlocking human creative potential when the necessities of life are met and people can pursue fuller self-development when freed from having to do demotivating, low-skill, low-pay work. We will work during class to generate “pro” and “con” presentations on UBI in real time that will then be presented. You will be assigned to “pro” and “con” positions randomly, after arriving in class.

Readings and Media:

1. Nathan Heller, “Who Really Stands to Win from Universal Basic Income?” *The New Yorker*, July 9 & 16, 2018.
2. Excerpts from books and articles by: Annie Lowrey, Andy Stern, Charles Murray, Philippe Van Parijs and Yannick Venderborghts, Chris Hughes, Rutger Bregman (I will provide a complete list two weeks before the debate; Study.Net will have the readings.)

Tuesday, December 5

Session 12: When Technology Makes Us Worse – How We Can Make Technology Better

Technology, when partially displacing human labor, can sometimes create the conditions under which the human skills that are still needed to complement the technology are worsening over time. How should we deal with situations where technology makes us worse? Our tech vignette concerns the automation for flying airplanes, known as “fly by wire”. Nicholas Carr develops a full thesis of how “automation makes us dumb” across a wide array of technological examples.

TECH VIGNETTE: Fly-by-Wire on [AirBus 330](#) vs. problems with [Boeing 737 Max](#) (F)

1. How is flight safety *enhanced* by this form of automation? In what ways does fly-by-wire *hinder* flight safety? Compare the first video, describing the “fly-by-wire” system for Airbus and the second video, probing the problems with Boeing 737 MAX.
2. An hour and a half into your trans-Atlantic flight, the flight attendant comes on the loudspeaker with bad news. S/he can either announce 1.) “The fly-by-wire system is completely down and will be for the remainder of the flight.” *or* 2.) “Both the pilot and the co-pilot are unconscious and will be for the remainder of the flight.” As a passenger who enjoys living, which would you prefer?

Readings and Media:

1. Nicholas Carr, “Automation Makes Us Dumb.” *Wall Street Journal*, Nov 21, 2014.
2. Nicholas Carr, “Why Robots Will Always Need Us.” *New York Times*, May 20, 2015.
3. Madeline Clare Elish, “Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction,” *Engaging Science, Technology, and Society* 5, 2019, pp. 40-42; 46-52.