MKTG8550401
AI in Our Lives: The Behavioral Science of Autonomous Technology

Spring 2023

INSTRUCTOR

Stefano Puntoni
Sebastian S. Kresge Professor of Marketing
puntoni@wharton.upenn.edu
https://marketing.wharton.upenn.edu/profile/puntoni/

TEACHING ASSISTANT

Jiani Xue
PhD student in Marketing
jennyxue@wharton.upenn.edu

OFFICE HOURS

Mondays: 10:00 – 10:45 & 13:30 – 14:15, open door
Office: JMHH 760

FACULTY LUNCHES

I will schedule a number of informal lunches during the term. These are totally optional. The lunches will take place on Mondays. The dates will be announced at the beginning of the course. Depending on covid infection rates, the lunches may be replaced by outdoor walks.

COURSE OUTLINE

"AI in Our Lives: The Behavioral Science of Autonomous Technology" (or "AI in Our Lives" for short) takes a behavioral perspective on the topic of autonomous technology, such as Artificial Intelligence. It reviews new behavioral insights to help companies thrive in the dawning age of smart machines. We focus on both the behavior of consumers and how managers should make decisions about consumers. Related to the former, the emerging behavioral science of autonomous technology helps us understand barriers to consumer adoption and how to design captivating AI experiences. Related to the latter, we discuss how to improve decision-making with data and algorithms. This is a non-technical course. No coding or data science skills are required.

The course uses interdisciplinary materials and a blend of pedagogical approaches, including interactive lectures, workshops, guest lectures, and case discussions. In addition to its many substantive insights, the course offers moments of reflection to help you understand how technology is changing our lives, and how each of us can help effect positive change in the world.

The course bridges two perspectives. On one side, we acknowledge the tremendous value that autonomous technology can provide to firms and individual consumers. In many ways, automation defines progress. On the other side, we examine emerging risks for consumers in an AI-driven economy. The main theoretical lens will be offered by psychology, but we will also examine ideas from economics, management, history, statistics, computer science, art, sociology, and philosophy. The application contexts will be focused on marketing. While also relevant to other disciplines (e.g., operations, IT, innovation, or general management), this course is therefore especially suitable for students interested in a career in marketing (e.g., product management, brand management, service design, and customer experience management).

The ultimate goal of the course is to help ensure that the amazing technologies currently being developed bring about positive change. The course will strive to achieve that by tackling the following UN Sustainable Development Goals: SDG9 (Innovation), SDG8 (Economic growth), SDG3 (Health and wellbeing), SDG10 (Reduced inequality), and SDG12 (Responsible consumption and production).

The course complements the research activities of the new Wharton Human-Centered Technology Initiative.

COURSE OBJECTIVES

Learning areas	Objectives
I. Content- related	O1: Students will understand the value-creating potential of Artificial Intelligence (AI) for products and services
	O2: Students will understand the psychological processes that govern consumers' reactions to automation in the marketplace
II. Skills-related	O3: Students will acquire effective tools for combining human and machine intelligence in decision making
	O4: Students will learn how to design positive consumer AI experiences
III. Attitude-related	O5: Students will learn to reflect on the way AI is changing their own lives, as well as business practice

READINGS

The course requires a moderate amount of reading (see reference list in session outline below). The readings will comprise of cases and articles from academic and managerial journals. The readings are available freely or via library services.

The readings are not substitutes for the class content. This means that you cannot get the content of the class from the readings only and that you cannot just attend a class to know the content of the readings. The purpose of the readings is to (1) complement the content discussed in class; (2) provide background to the sessions; and (3) expose you to additional relevant ideas that it is not possible to cover in class due to time limitations.

I will post on Canvas all the slides used in the sessions (except those from guest speakers). The slides will be posted after each session. Additional relevant readings may also be posted after the sessions.

ASSESSMENT

Assessment will entail a mix of individual (60%) and group (40%) assignments. The course will feature the following grade components:

1. In-class participation (10%, A0)
2. Group case write-ups (5% x3, A1-A3)
3. Individual assignment: Consumer AI experiences (20%, A4)
4. In-class individual assessment (30%, A5)
5. Main group project: Putting Machines to Work (25%, A6)

Important information:

- Each assignment will be graded on a scale from 0 to 10. The overall course score will be computed using the weights above. The final grade will be computed from the overall score by applying customary cut-off points. More information about each assignment is provided below.

- For the group assignments, you will work in groups of 5 or 6. I will create the groups at the beginning of the course using random sampling. The reason for this random assignment is threefold: (a) to facilitate inclusiveness, (b) to build teamwork skills, and (c) to grow social networks (especially important after the covid pandemic). You will work with the same group for all group assignments. To ensure fairness, all students will be asked to grade the relative contribution of their team members at the end of the course.

CLASSROOM EXPECTATIONS

- Class starts and ends on time
- Sit according to the seating chart (this will be created after the first couple of sessions)
- Late entry or reentry only under exceptional circumstances
- Name tents displayed
- **I strongly advise keeping phones, laptops and other devices turned off during the sessions.**
  - I will post slides and other materials used in class on Canvas, so you won't need to write down what is on the slides. Slides will be numbered to facilitate note taking.

SUMMARY OF SESSIONS

All classes: 3:30-5:00 PM

Date	Topic	Readings	Assignments
Tue 1/17	**Welcome** Introduction to the course. Why a behavioral science course on AI?	This course syllabus	
Thu 1/19	**Machine earning** How AI creates value for consumers and firms.	Brynjolfsson, McAfee (2017), "The Business of Artificial Intelligence," *Harvard Business Review*, https://hbr.org/2017/07/the-business-of-artificial-intelligence Furman, Seamans (2019), "AI and the Economy," *Innovation Policy and the Economy*, https://www.journals.uchicago.edu/doi/full/10.1086/699936	
Tue 1/24	**There is no Y in AI** A framework for understanding intelligence, human and artificial.		
Thu 1/26	**Putting machines to work** A framework to help us think about how to leverage the strengths of humans and machines.	Agrawal et al. (2016), "The Simple Economics of Machine Intelligence," *Harvard Business Review*, https://hbr.org/2016/11/the-simple-economics-of-machine-intelligence	Briefing for A6.
Tue 1/31	**Decision-driven analytics** A decision-oriented framework for making decisions with data and algorithms.		
Thu 2/2	**The big picture** What problems can AI help us solve?	De Cremer, Kasparov (2021), "AI Should Augment Human Intelligence, Not Replace It," *Harvard Business Review*, https://hbr.org/2021/03/ai-should-augment-human-intelligence-not-replace-it	
Tue 2/7	**The Proteus case, part 1** Discuss a new case on AI and health.	The Proteus case (see Canvas)	A1 due
Thu 2/9	**The Proteus case, part 2** You'll meet the founders of Proteus: Andrew Thompson, CEO, and George Savage, Head of R&D. They will draw light on technology's potential to improve society—and our failure to often do so.		
Tue 2/14	**Decision-driven analytics in practice** Guest lecture by Siddharth Nagarkatti, SVP, Acquisition & Deepening Effectiveness Insights, Bank of America		
Thu	**The psychology of AI, part 1: When**	Puntoni (2018), "Amazing Machines and the	

2/16	**I am replaced** Understanding psychological reactions to autonomous technologies.	Quest for Meaning in Consumption," *Marketing Intelligence Review*, https://www.nim.org/en/publications/gfk-marketing-intelligence-review/all-issues/iot-consumers-and-internet-things/amazing-machines-and-quest-meaning-consumption	
Tue 2/21	**The psychology of AI, part 2: When they are replaced** Understanding psychological reactions to autonomous technologies.	Granulo, Fuchs, Puntoni (2021), "Preference for Human (vs. Robotic) Labor is Stronger in Symbolic Consumption Contexts," *Journal of Consumer Psychology*, https://onlinelibrary.wiley.com/doi/full/10.1002/jcpy.1181	
Thu 2/23	**Consumer AI experiences** A framework to understand the consumer experience of AI.	Puntoni, Reczek, Giesler, Botti (2021), "Consumers and Artificial Intelligence: An Experiential Perspective," *Journal of Marketing*, https://journals.sagepub.com/doi/abs/10.1177/0022242920953847	Briefing for A4.
Tue 2/28	**No Class**		
Thu 3/2	**No Class**		
Tue 3/7	**No Class**		
Tues 3/9	**No Class**		
Tue 3/14	**The TomTom case, part 1** Managing brands in the age of AI disruption.	The TomTom case (see Canvas)	A2 due
Thu 3/16	**The TomTom case, part 2** You'll meet Matthieu Campion, one of the protagonists of the TomTom case, and now Regional Marketing Lead at Shell Recharge. It will be an opportunity to learn more about the TomTom case and to discuss the future of the automotive sector.		A4 due on 3/17
Tue 3/21	**More insights on the psychology of technology** Dr. Shiri Melumad and Dr. Robert Meyer will present their groundbreaking research on the psychology of technology.		
Thu 3/23	**The Wizenoze case, part 1** Discuss a new case on AI and education.	The Wizenoze case (see Canvas)	A3 due
Tue 3/28	**The Wizenoze case, part 2** Update and Q&A with Wizenoze co-founder and CEO Diane Janknegt.		
Thu 3/30	**Managing AI experiences in practice**		

	Sohit Karol, UX Manager, Google		
Tue 4/4	**Using AI to improve human communication** Noah Zandan, CEO and Founder, Quantified.ai		
Thu 4/6	**Ethics** Human preferences for machine ethics. Ethical issues emerging as an interaction between human and machine behavior. Responses to gendered AI.	Awad et al. (2018), "The Moral Machine Experiment," *Nature*, https://www.nature.com/articles/s41586-018-0637-6. Ransbotham (2017), "Four Management Lessons From Self-Driving Cars," *MIT Sloan Management Review*, https://sloanreview.mit.edu/article/four-management-lessons-from-self-driving-cars/	
Tue 4/11	**In-class assessment** We will look back at what we've learned in the course.		A5 will be taken in class
Thu 4/13	**Presentations for Assignment A6** [Only presenting teams are required to attend.]		A6 due
Tue 4/18	**Presentations for Assignment A6** [Only presenting teams are required to attend.]		
Thu 4/20	**Conclusions** Reflections on the time we live in.	Wertenbroch (2021), "Marketing Automation: Marketing Utopia or Marketing Dystopia?," *NIM Marketing Intelligence Review*, https://www.nim.org/en/publications/gfk-marketing-intelligence-review/all-issues/dark-sides-digital-marketing/marketing-automation-marketing-utopia-or-marketing-dystopia Bostrom (2019), "The Vulnerable World Hypothesis," *Global Policy*, https://www.nickbostrom.com/papers/vulnerable.pdf [To be skimmed] Morris (2010), "Social Development". http://pzacad.pitzer.edu/~lyamane/ianmorris.pdf [To be skimmed]	

ASSIGNMENTS AND ASSESSMENT

A0: Class participation (10%)

A poorly prepared class invariably leads to an unrewarding experience for all involved. Thus, the long-term benefits from this course will be proportional to the extent that you make this course *your* project. This means that you are expected to come to class prepared and to actively participate.

Specifically, you are expected to contribute to an informed exchange about the topic of the class and to have well-developed points of view about the cases and other reading materials. Your participation will be judged based on four criteria (in decreasing order of importance): (a) your ability to facilitate a constructive and insightful discussion, (b) the quality of your comments, (c) regular contributions to the conversation, (d) your attentiveness in class. Obviously, to perform on any of these dimensions it is necessary to attend the sessions.

Active participation during guest lectures and during case discussions will be assigned extra weight.

A1-A3: Group case assignments (3 x 5% = 15% in total)

On February 7, 14, and 23 we will discuss three business cases. The first is about Proteus, a digital health company. The second is about TomTom, a mapping and navigation company. The third is about Wizenoze, an AI-powered education service. For each case, you will hand in a group case report prior to the session.

You will work in teams of 5 or 6 (pre-assigned, see above) to analyze the three cases prior to the class discussion. The groups should be the same for all three case write-ups.

The deliverable for each case is a pdf document (maximum 1.000 words). Make sure to mention your names and your PennKeys on the first page.

The reports must be submitted before the case discussion. Respecting the deadlines is very important. Reports will not be graded if they are received after the case has already been discussed (no exceptions). For each case, two questions will constitute the basis for the assignment (equal weight):

Proteus (February 7)
1)   Analyze the potential impact (positive and negative) of the introduction of Ingestible Event Markers on each of the key stakeholders in the health industry.
2)   Explain how business models for players in the health industry are (or are not) built for optimized patient outcomes.

TomTom (March 14)
1)   How are technological developments changing the navigation software industry?
2)   Moving forward, what are the strategic options for TomTom to compete with Google?

Wizenoze (March 23)
1)   What are the customer segments that Wizenoze could target? How does Wizenoze's services add value for each of these?
2)   What do you see as the biggest challenges for Wizenoze moving forward?

The pedagogical value of this assignment is compromised when students access external information, instead of relying exclusively on the documentation provided. To highlight specific issues, facts may be distorted and

important situational factors might be omitted. Therefore, <u>you should not rely on information about the case from outside sources.</u>

The assignments will be graded using a simplified grading structure: "Did not submit" = 0; "Poor" = 4, "Acceptable" = 6, "Good" = 8, "Excellent" = 10. The individual grade will also reflect peer-evaluations of contribution.

Primary learning objectives: O1, O4
Deadline Proteus: Tuesday 2/7 at 1:45 PM (on Canvas)
Deadline TomTom: Tuesday 3/14 at 1:45 PM (on Canvas)
Deadline Wizenoze: Thursday 3/23 at 1:45 PM (on Canvas)

A4: Consumer AI experiences, Individual assignment (20%)

In this individual report, for each of the four consumer AI experiences discussed in the course (data capture, classification, delegation, and social experiences), you will consider an AI-driven consumer solution of your choice and analyze how to best design the consumer experience in order to maximize benefits and minimize downsides for users. More information about this assignment will be provided on February 23.

The deliverable is a pdf document (maximum 1.500 words). After a cover page with your name and student number, you should analyze one case for each of the four AI experiences. For each, make sure to include the link to the company's website (or to some other source of information).

The grading criteria will focus on, in decreasing order of importance, (a) insightfulness of the analysis (e.g., reliance on logical arguments, conceptual coherence, use of literature, novelty and usefulness of the insights), (b) interestingness of the chosen examples, and (c) clarity and structure of the document.

Note that you will not have many days to complete this assignment after the briefing session. Make sure to plan in advance and reserve time in your calendar.

Primary learning objectives: O1, O2, O3, O4
Deadline: Friday March 17 at 5:00 PM (on Canvas)

A5: In-class individual assessment (30%)

This will be a mix of multiple choice and open questions to assess your level of preparedness following the substantive part of the course.

Primary learning objectives: O1, O2, O3, O4
The start and end will coincide with the class time, on Tuesday April 11.
Submission on Canvas.

A6: Putting machines to work, Group assignment (25%)

In this assignment, you will work in teams of 5 or 6 to identify new business opportunities by leveraging the recording and matching capabilities of AI discussed in the course.

You will choose a business context (e.g., transportation, health, education, entertainment, etc.) and apply the tools from the course to analyze the innovation potential of AI capabilities. More information about this assignment will be provided on January 26.

The deliverable is a pdf document (maximum 2.000 words). The cover page should list the team members' names and PennKeys. You are free to organize the rest of the document the way you prefer.

Make sure to use evidence and literature as much as possible to support your claims. That may include desk research (e.g., academic literature, industry reports) and primary research (e.g., interviews with managers, surveys of consumers). You are free to add as many appendices and references as you like. These are not included in the word count.

Teams will be asked to present their project at the end of the course.

The grading criteria will focus on, in decreasing order of importance, (a) insightfulness of the analysis (e.g., reliance on logical arguments, conceptual coherence, use of literature, novelty and usefulness of the insights), (b) interestingness of the chosen examples, (c) quality of the oral presentation, and (d) clarity and structure of the document.

The individual grade will also reflect peer-evaluations of contribution.

Primary learning objectives: O1, O3
Deadline: Thursday April 13 at 1:00 PM (on Canvas)

ASSESSMENT PLAN AND SUMMARY OF DEADLINES

The table below contains the course's assessment plan. It links each assignment with the course's objectives and summarizes the key features of the assignments. It includes also as a summary of the assignment deadlines.

Course: AI in Our Lives	Assessment information					
After following this course,	A0	A1-A3	A4	A5	A6	Total
O1: Students will understand the value-creating potential of Artificial Intelligence (AI) for products and services	X	X	X	X	X	30%
O2: Students will understand the psychological processes that govern consumers' reactions to automation in the marketplace	X		X	X		20%
O3: Students will acquire effective tools for combining human and machine intelligence in decision making	X			X	X	20%
O4: Students will learn how to design positive consumer AI experiences	X	X	X	X		20%
O5: Students will learn to reflect on the way AI is changing their own lives, as well as business practice	X		X			10%
SUBMISSION DEADLINES	NA	February 7, 14, 23	March 17	April 11	April 13	
Percentage grade	10%	15%	20%	30%	25%	100%
Deliverable	NA	Report x 3	Report	Test	Report	
Assignment type (Group/Individual)	Individual	Group	Individual	Individual	Group	