Interdisciplinary Programmes

Academic year 2019-2020

Artificial Intelligence and The Future of Work

MINT120 - Autumn - 3 ECTS

29 and 30 November 2019
Room S3

Course Description

Machine learning and other forms of artificial intelligence stand to transform the world in remarkable and unpredictable ways – some that are desirable and others that are not. From delivering better language translation services, enabling new ways to produce goods or powering dramatic shifts in transportation and energy systems, the transformative powers of artificial intelligence will have a dramatic impact on how we create, exchange and distribute value. Perhaps the most important channel for such transformations will occur in labor markets, as artificial intelligence shapes the future of work – and therefore the kind of societies we live in and value we deliver to one another.

By looking at the major theoretical frameworks in economics and sociology, assessing the latest trends and exploring the capabilities of specific machine learning approaches, this course takes a "zoom-out, zoom-in" approach to appreciating how the most important general purpose technology of the Fourth Industrial Revolution can influence the demand, supply and quality of jobs, tasks, skills and work environments around the world. In doing so, it will bring students together to consider the practical ramifications of one of the 21st century's most promising, and perhaps perilous, technologies – its impact on the future of work.

> **PROFESSORS**

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Head of Science and Technology Studies, World Economic Forum

Syllabus

COURSE MATERIAL

The following are the main references used in the workshop. Students should familiarize themselves with each of the following before the workshop:

- Alphabeta, 2017, "The Automation Advantage", http://www.alphabeta.com/wp-content/uploads/2017/08/The-Automation-Advantage.pdf
- Autor, 2015, "Why are there still so many jobs? The history and future of workplace automation", Journal of Economic Perspectives, 29(3)
- Scherer, Matthew, 2016, "Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies"
- Frey and Osborne, 2013, "The Future of Employment: How susceptible are jobs to computerization?"
- Stiglitz and Korinek (2017), "Artificial Intelligence, Worker-Replacing Technological Change and Income Distribution"
- World Economic Forum, 2018, "Towards a Reskilling Revolution", https://www.weforum.org/reports/towards-a-reskilling-revolution

Students are also asked to pick at least one article or book from the "Other Interesting Materials" report below, and read or review the material for discussion during class.

COURSE EVALUATION

Evaluations will be based on:

(i)   An individual written assignment given at the end of day 1, to be completed and submitted before day 2 (a brief scenario focused the future of work)
(ii)   A group assignment on responding to the impact of AI and machine learning, to be handed in one week after day 2

OVERVIEW and PEDAGOGICAL OBJECTIVES

The course will consist of 1.5 days of presentations, discussions and group work focused on the evolution of jobs, employment and skills as machine learning is introduced into production and services at a global scale.

Participants will work together in teams to grapple with questions about contentious topics with uncertain outcomes. The groups will produce a scenario on the future of work and will put together a presentation for the following week.

The objectives of the course are threefold:
1) To help students think holistically and systemically about the process of change that takes place when new technologies are introduced and transform the means of production,
2) To encourage students to formulate and design future scenarios as a means of addressing potential outcomes from technological integration into economies and societies, and
3) To cultivate a collective and collaborative effort from groups employing systems and scenario thinking in order to model an inclusive multistakeholder approach to scenario building and problem solving.

DRAFT SCHEDULE AND CLASSES

Day	Time	Topic
Day 1	12:15-12:45	**Welcome – Workshop Introduction** Workshop group selection will be communicated upon arrival
	12:45-13:30	**The Big Picture View on 21st Century Technology** Presentation (30min) – What are we talking about and why does it matter? AI, being human, and the role of work (labor laws, families, demographics, etc) Discussion (15min)
	13:30-14:45	**The Challenge and Opportunity of AI and machine learning** Presentation (15min) – The promise and peril of AI (Major themes, hype and fear around disruption, transformation and creation) Groups (45min) – Exploring selected applications of AI in action and assessing their impact Discussion (15min)
	14:45-15:00	**Break**
	15:00-16:15	**Theoretical frameworks: Make sense of a changing world of work** Interactive discussion (15min) – What are the major economic and social theories of change we bring to bear when assessing how technology transforms labour markets? Groups (45min) – What assumptions and models do we invoke when thinking about the future of work? What matters most to us and others about how the future of work actually is experienced? Discussion (15min)
	16:15-17:30	**Drivers of the AI Transformation** Presentation (15m) - Scale, Knowledge and Needs Groups (60min) - Which drivers will have the greatest impact? What social, economic, environmental and political priorities should we focus upon? **Assignment:** Generate an AI scenario that that impacts society, employment models and skills in interesting ways that are highly relevant for your organization, sector or industry. Brainstorm positive and negative externalities across stakeholder domains beyond entrepreneurs and employees. Assess how this scenario could affect demand and supply of jobs, tasks and skills, giving examples of at least three different types of workers.
	17:30-18:00	**Day 1 Wrap-Up and Review**

Day 2	09:00- 10:45	**The Shifting Skills Landscape** Presentation (30m): AI, robotics, and the latest data on employment and skills Groups (1h15min): Student reflections on day 1 scenarios
	10:45- 11:00	**Break**
	11:00- 12:30	**How AI Will Change Your Organization and Your Job** Presentation (15min) – Bringing together frameworks for assessing how machine learning affects your organization or work, and how the type of work we do will may become radically different. Groups (1h15min): Deep dive into the structural, operational and functional impact of AI at the firm level.
	12:30- 13:30	**Lunch**
	13:30- 15:00	**Stakeholders, Skills and Strategies** Presentation (30m): What are education and skills for? What counts as a 'human' skill and what is the role of emotion and creativity? Groups (1h): Responding to the ramifications of AI. How can we transform skills development? What kinds of investment are required for a future with AI? What are the possibilities and limitations facing populations? What strategies would you take for your own development?
	15:00- 15:30	**Break**
	15:30- 16:45	**Finalizing Strategies for Working with AI and machine learning** Groups Prepare final PPT presentations (30m) Group Presentation (45m) on final plan and change strategy for addressing AI
	16:45- 17:00	**Short Break**
	17:00- 18:00	**Day 2 Wrap Up, Review and Close** Discussion (~30m) of presentations Takeaways, final thoughts and comments from instructors and faculty

OTHER INTERESTING READINGS AND RESOURCES

Title	Author(s)
Industries of the Future	Alec Ross
The Sharing Economy: The End of Employment and the Rise of Crowd-based Capitalism	Arun Sundararajan
The Future of the Professions: How Technology Will Transform the Work of Human Experts	Richard Susskind and Daniel Susskind
Surviving the Machine Age	Kevin LaGrandeur and James Hughes
The Sentient Machine: The Coming Age of Artificial Intelligence	Amir Husain
Rise of the Robots	Martin Ford
"A Round Up of Robotics and AI ethics: part 1 Principles"	Alan Winfield http://alanwinfield.blogspot.ch/2017/12/a-round-up-of-robotics-and-ai-ethics.html
Innovation and Its Enemies: Why People Resist New Technologies	Calestous Juma
The Ethics of Invention: Technology and the Human Future	Sheila Jasanoff
The Future of Jobs and Skills in Africa	https://www.weforum.org/reports/the-future-of-jobs-and-skills-in-africa-preparing-the-region-for-the-fourth-industrial-revolution
"Classifying Work In The New Economy"	Peter Cappelli and JR Keller
Technology at Work	Carl Frey and Michael Osborne
AI, Robotics and the Future of Jobs Report	Pew Research Center
Creativity vs. Robots: The Creative Economy and the Future of Employment	Hasan Bakhshi, Carl Frey and Michael Osborne
"Skills, education, and the rise of earnings inequality among the "other 99 percent"	David Autor, Science Magazine
Laborem Exercens	Pope John Paul II
"Life Without Work"	Ted Nunez
"Lousy and Lovely Jobs: the Rising Polarization of Work in Britain"	Maarten Goos and Alan Manning
The Race between Technology and Education	Claudia Goldin and Lawrence F. Katz
The Shift: The Future of Work Is Already Here	Lynda Gratton
Shaping the Fourth Industrial Revolution	Klaus Schwab and Nicholas Davis

INSTRUCTOR BIOS

Nicholas Davis is Professor of Practice at Thunderbird School of Global Management at Arizona State University. Until August 2019, Nick was Head of Society and Innovation and Member of the Executive Committee at the World Economic Forum, leading the Forum's work on "The Fourth Industrial Revolution". With Klaus Schwab, the Founder and Executive Chairman of the World Economic Forum, he is the co-author of *Shaping the Fourth Industrial Revolution*, published in January 2018. Originally from Sydney, and previously a commercial lawyer, Director at Oxford Investment Research and the World Economic Forum's Head of Europe, Nick is a Certified Professional Facilitator and a Fellow of the Royal Society of the Arts (FRSA) in the UK. He sits on the board of the IMPROVE European Innovation Management Academy and holds degrees in Arts and Law from the University of Sydney as well as a Masters of Business Administration from the University of Oxford.

Dr. Thomas Philbeck is Head of Science and Technology Studies at the World Economic Forum in Geneva, Switzerland. With a primary focus on the intersection between technology, society, business and philosophy, he helps the World Economic Forum in shaping and advocating a values-based and human-centered approach to the Fourth Industrial Revolution. He has published work on posthumanism and ontology, technology and ethics, and technological unemployment. He is passionate about art, flying, science fiction, education and the cosmos.