Innovation Economics: The Case of Artificial Intelligence

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Course Description

This module introduces students to basic concepts of innovation economics through the exemplary case of Artificial Intelligence (AI). Students will get familiar with economic perspectives used to understand the emergence and development of this (disruptive) technology. In particular, students will learn about main concepts of AI (e.g., what is machine learning, supervised and unsupervised learning, etc.), links between AI and other technologies, empirical approaches used to identify and measure AI innovations, the potential of this technology as a tool for political control, and other potential risks linked to AI. At the end of the course, students will be able to better understand the challenges of AI-related empirical research, the particularities of AI as an important emerging technology, and will be more familiarized with relevant concepts needed to develop their own innovation studies.

Contents (short)

- Introduction: what is AI?
- How to identify and measure AI innovations.
- AI as a technology.
- AI as a piece of knowledge.
- AI and innovation policy.
- AI and political control
- Conclusions

Contents (long)

<   Introduction

- Overview and main concepts (Russell and Norvig, 2010)
- Technical introduction (how do machines actually "learn"; what is the underlying architecture; what can be done by machines and what cannot be done by machines (yet))

<   How to identify and measure AI innovations

- Patent data, publication data, and other sources.

<   AI as a technology

- Upsides and downsides of AI.

<   AI as a piece of knowledge

- What is knowledge and the role of knowledge relatedness (Breschi et al., 2003; Hidalgo, 2021; Hidalgo et al., 2007)
- How AI is linked to existing knowledge and how it is combined with other technologies (Leusin, 2022b)
- AI and firms: who are the global leaders, and how AI is affecting firms (Leusin, 2022a)

<   AI and innovation policy

- Policy approaches and technological development.
- How institutions affect innovations in general (Acemoglu and Robinson, 2012)

< AI, automated surveillance, and politics

- Surveillance, privacy, and censorship (Feldstein, 2021; Karpa et al., 2022; King et al., 2013; Roberts, 2018, 2020)
- Automation, unemployment, and other risks (Acemoglu, 2021; Korinek and Stiglitz, 2018)
- Surveillance in democracies (Büchi et al., 2022; Davis and Silver, 2004; Ziller and Helbling, 2021)
- Case study: Facial recognition in China (Beraja et al., 2021; Beraja et al., 2022; Kostka et al., 2021)

< Conclusions

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