Digital Skills Workshop | Big Data and AI

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Course Description

The increasing digitalization of our everyday lives, from smartphones to social media, e-commerce or digital public services, is generating an unprecedented amount of data. Fueled by these big data, AI approaches are becoming more and more prevalent and have proved to be remarkably powerful in certain areas. At the same time, there are serious concerns related to AI approaches, including their inherent biases and unwanted consequences of algorithmic decision making but also a lack of effective regulation and safeguards. This workshop will first provide an overview of the current state of big data and AI including technical, ethical and regulatory challenges. Working in smaller groups, you will then deepen your knowledge by working on case studies and developing concrete concepts for the responsible use of big data and AI approaches in diverse decision-making contexts.

Course Structure

09:00 – 10:15 **Lecture: Fundamentals of Big Data & AI**
- Overview lecture (slides available on course website)
- Current state of big data and AI

10:15 – 10:30 (Virtual) Coffee break and case study assignment

10:30 – 12:00 **Case Study Work: Responsible Use of Big Data & AI**
- Work in smaller groups on one of three case studies (briefs available on course website)
- Six breakout rooms, two for each topic

12:00 – 13:00 **Case Study Presentations**
- Short presentations (max. 5 min + Q&A)
- Each groups presents key results and take-aways

Course Website

Slides and case study briefs will be made available through the course website:
https://www.karstendonnay.net/teaching/fall2021/skills/

Suggested Pre-Reading Materials

Shaw, Jonathan. (2014). Why 'Big Data' is a Big Deal, *Harvard Magazine*, March-April 2014.

Wigglesworth, Robin. (2018). Can Big Data Revolutionise Policymaking by Governments? *Financial Times*, 31 January 2018.

West, Darrel M. (2018). What is Artificial Intelligence? *The Brookings Institution*.

Satell, Greg & Yassmin Abdel-Magied. (2020). AI Fairness Isn't Just an Ethical Issue. *Harvard Business Review*.

Further Related Readings and Resources

Big Data, AI & Machine Learning

Dutcher, Jenna. (2014). What is Big Data? *UC Berkeley Data Science Blog.*

Ehl, Christian. (2018). Data – The Fuel for Artificial Intelligence. *Medium.*

Opperman, Artem. (2019). What is Deep Learning and How does it Work? *Towards Data Science.*

Rosebrock, Adrian. (2021). What is Deep Learning? *Blog Post.*

Challenges and Problems

Stahl, Bernd Carsten & David Wright. (2018). Ethics and Privacy in AI and Big Data: Implementing Responsible Research and Innovation. *IEEE Security & Privacy* 16(3): 26-33.

Berendt, Bettina, Marco Büchler & Geoffrey Rockwell. (2015). Is it Research or is it Spying? Thinking-Through Ethics in Big Data AI and Other Knowledge Sciences. *Künstliche Intelligenz* 29: 223-232.

Lazer, David. (2015). The Rise of the Social Algorithm. *Science* 348(6239): 1090-1091.

AI in Practice

Cohen-Inger, Nurit. (2021). Bias and Discrimination in AI: Whose Responsibility is it to Tackle them? *VentureBeat Blog Post.*

Gunson, Nancie et al. (2021). Coronabot: A Conversational AI System for Tackling Misinformation. *Proceedings of the Conference on Information Technology for Social Good.* New York, NY: ACM, p. 265-270.

Hamborg, Felix et al. (2021). Newsalyze: Effective Communication of Person-Targeting Biases in News Articles. *Proceedings of the ACM/IEEE Joint Conference on Digital Libraries (JCDL).* New York, NY: ACM.

Cortiz, Diogo & Arkaitz Zubiaga. (2021). Ethical and Technical Challenges of AI in Tackling Hate Speech. *The International Review of Information Ethics* 29: 1-10.