University of Applied Science
Department of Computer Science
Reflections on Computer Science, Society and Ethics
Summer Semester 2024 [Updated: January 10, 2024]

A) Course and Contact Information:

Instructor:	Sami Khuri
Email:	sami.khuri@fh-krems.ac.at [The best way to get in touch with me]
Class Days/Time/Place:	See section "Course Schedule" at the end of the syllabus
Prerequisites:	None

Course Format:

We will meet on the days and times mentioned in the Course Schedule at the end of the syllabus. We will use Canvas as our Learning Management System. All course materials should be accessed through Canvas. To prepare for class, please complete weekly readings and get ready for quizzes before coming to class. Classes will be interactive, and we will alternate between short lectures, student presentations, and exercises. Please bring your laptop/PC to every single class. We will have a) short quizzes at the beginning of class, b) in-class student presentations, and c) hands-on exercises prepared by students who give the in-class presentations – students will have to answer the presenters' questions and submit their answers to the instructor.

Class Website: Canvas Learning Management System and Messaging:

Course materials, such as syllabus, handouts, notes, hands-on exercises, reading material, etc. can be found at **https://canvas.instructure.com/courses/8429429**
Please regularly check Canvas announcements to learn of any updates.

Course Content [From "Bachelor Program – Informatics"]:

Subject areas related to the critical algorithm studies are reviewed, critically analyzed, and discussed from ethical, cultural, and sociological viewpoints by means of lectures and contributions from students

Course Learning Outcomes (CLO) [From "Bachelor Program – Informatics"]:

Upon completion of this course, students are able to:

- critically reflect on and discuss ethical, social, and cultural aspects of information technology as framed by interdisciplinary overlaps,
- manage and moderate a critical discussion of ethical questions connected with informatics, data, and related responsibilities, and formulate possible courses of action based on this discussion.

Required Textbook:

We will be using notes written by the instructor, and articles that can be accessed either via the Internet or are available in Canvas.

There is no required textbook for this course.

Course Topics:

A) **Algorithmic Decision Making [I]**
B) **Algorithmic Decision Making [II]**
C) **AI and Autonomous Systems [I]**
D) **AI and Autonomous Systems [II]**
E) **AI and Autonomous Systems [III]**
F) **Data Collection, AI, and Regulations**

B) Course Requirements and Assignments:

1. **Presentations (40%):** Each student chooses one of the articles in their topic, with consultation with their team-members and gives a 10 to 15-minute presentation to the whole class. As part of the presentation, the presenter prepares 2 questions to be given to the class following the presentation.

2. **In Class Submission (40%):** Right after the presentation, the presenter will introduce 2 questions for discussion to the whole class. The discussion should take around 5 minutes after which students write down their answers to the two questions. The answers to all questions of all presentations on that given day, should be submitted to the instructor at the end of class.

3. **Quizzes (20%):** We will have five, 15-minute quizzes at the beginning of the following classes: March: 14, 21 and April: 4, 11, 25. The quizzes will be on the articles marked with [Q] in "Course Schedule" at the end of the syllabus.

C) Class Recommendations and Expectations:

- Regular class attendance is expected.
- During class-time, take notes and ask questions. Your goal during class should be to engage actively and make connections so that the topics make sense to you. My goal is to help you make these connections.
- Reach out to your classmates to establish study-groups and email me with your question as they arise. Don't wait until you're struggling with a problem. Address any issues well before your presentations and well before assessments take place. Reach out when you need assistance developing a strategy either for a problem (or presentation) or for managing the course.

D) Grading Information:

Grade calculation will be based on the following:

Presentations (40%) In Class submissions (40%) Quizzes (20%)

Grade Scale:

Point Range	Course Grade
91.0 – 100	1
81.0 - 90.99	2
71.0 - 80.99	3
60.0 - 70.99	4
< 60.0	5

E) Tentative Course Schedule:

The course schedule is subject to change with fair notice. Changes will be announced in Canvas.

Course Schedule

Week	Day Time Place	Topics, Readings, and Quiz Articles [Q]
1	**7/3** **9-10:45** **G.2.10**	**Introductions; Syllabus; Course Expectations; Installing Python and Jupyter Notebooks via Anaconda [Optional]; Team Formation** **1)** ***Feynman's Error: On Ethical Thinking and Drifting*** **D. Munro (Nov 2018)** **2)** ***Partnership on AI*** **Partnership on Artificial Intelligence Organization** **3)** ***Can you make AI fairer than a judge? Play our courtroom algorithm game*** **K. Hao et al. (MIT Technology Review, 2019)**
2	**14/3** **9-10:45** **G.2.02**	**A) Algorithmic Decision-Making [I]** **[Q1]** ***Big Data: A Report on Algorithmic Systems, Opportunity, and Civil Rights*****, pages 1-16, 22-24 [Executive_2016]** **1)** ***Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*****, Cathy O'Neil. Introduction [ONeil_Intro_2016.pdf]** **2)** ***Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*****, Cathy O'Neil. Chapter 1 [ONeil_Chap1_2016.pdf]** **3)** ***The Misgendering Machines: Trans/HCI Implications of Automatic Gender Recognition*****, Os Keyes [Keyes_2018]** **4)** ***Algorithmic Injustice: A Relational Ethics Approach,*** **Birhane. (Patterns, Cell Press. 2021.) [Birhane_2021] pages 1-5.** **5)** ***A Guide to Solving Social Problems with Machine Learning*****, J. Kleinberg et al. (Harvard Business Review, 2016) [Kleinberg_2016].** **6)** ***The Problem with Intelligence: Its Value-Laden History and the Future of AI,*** **S. Cave. (AEIS 2020) [Cave_2020].**
3	**21/3** **9-10:45** **G.2.03**	**B) Algorithmic Decision-Making [II]** **[Q2]** ***Fair and Unbiased Algorithmic Decision Making: Current State and Future Challenges,*** **European Commission, Joint Research Center Technical Report, S. Tolan, December 2018; read Abstract and pages 3 – 7 [JRC_EC_2018]** **1)** ***Machine Bias,*** **J. Angwin et al., (ProPublica 2016)** **2)** ***How we Analyzed the COMPAS Recidivism Algorithm*****, J. Larson et al., (ProPublica, 2016) [Larson_2016]** **3)** ***Ethics of the algorithmic prediction of goal of care preferences: from theory to practice,*** **A. Ferrario A, et al. J Med Ethics 2023; pages 165 – 169 [Ferrario_2021]** **4)** ***Understanding algorithmic decision-making: Opportunities and challenges 5.5 ADS Fairness,*** **pages 47 - 54. [Euro_Parl_ 2019]** **5)** ***Intro to Probability and Machine Learning with the Perceptron*****, [Sahami_2021]** **6)** ***Recidivism*****, [Recidivism_2021] (Additional Material: *recidivism_1.ipynb*, *recidivism_2.ipynb*, *recidivism-testing-data.csv*, *recidivism-training-data.csv*)** **7)** ***tutorial_recidivism.ipynb*** **(Additional Material: compas-scores-two-years.csv)**

Week	Day Time Place	Topics, Readings, and Quiz Articles [Q]
4	**4/4** **9-10:45** **[VC]**	**C) AI and Autonomous Systems [I]** **[Q3]** ***Automation in Everyday Life*****, A. Smith et al., (Pew Research Center, 2017) pages 2 – 10. [Smith_2017]** **1)** ***Automation in Everyday Life*****, A. Smith et al., (Pew Research Center, 2017) Chapter 3, pages 29 – 38. [Smith_2017] *Find EU study and compare to USA** **2)** ***Automation in Everyday Life*****, A. Smith et al., (Pew Research Center, 2017) Chapter 4, pages 39 – 48. [Smith_2017] *Find EU study and compare to USA** **3)** ***Automation in Everyday Life*****, A. Smith et al., (Pew Research Center, 2017) Chapter 5, pages 49 – 56. [Smith_2017] *Find EU study and compare to USA** **4)** ***Never Mind the Trolley: The Ethics of Autonomous Vehicles in Mundane Situations*****, J. Himmelreich (Ethical Theory and Moral Practice, 2018) [Himmerlich_2018]** **5)** ***Society-in-the-Loop*****, I. Rahwan (ArXiv, 2017) [Rahwan_2017]** **6)** ***Future Facing: Maxwell Scholars Respond to the Rapid Rise of AI and Autonomous Systems,*** **Maxwell School of Citizenship and Public Affairs, Syracuse University, New York, 2023.**
5	**11/4** **9-10:45** **G1.1.24**	**D) AI and Autonomous Systems [II]** **[Q4]** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021]** **page 4: *About AI100* and pages 7 - 11: SQ1 – SQ12, WQ1 and WQ2** **page 71: Conclusions** **1)** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021] pages 12 - 18: SQ2** **2)** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021] pages 18 - 24: SQ3** **3)** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021] pages 24 - 29: SQ4** **4)** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021] pages 29 - 33: SQ5** **5)** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021] pages 33 - 37: SQ6** **6)** ***Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report*** **(Stanford, 2021) [Stanford_2021] pages 37 - 43: SQ7**

Week	Day Time Place	Topics, Readings, and Quiz Articles [Q]
6	**18/4 18:00 - 19:00 [ASN]**	**E) AI and Autonomous Systems [III]** **1) *Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report* (Stanford, 2021) [Stanford_2021] pages 43 - 47: SQ8** **2) *Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report* (Stanford, 2021) [Stanford_2021] pages 48 - 52: SQ9** **3) *Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report* (Stanford, 2021) [Stanford_2021] pages 53 - 56: SQ10** **4) *Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report* (Stanford, 2021) [Stanford_2021] pages 56 - 60: SQ11** **5) *Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report* (Stanford, 2021) [Stanford_2021] pages 63 - 67: WQ1** **6) *Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021 Study Panel Report* (Stanford, 2021) [Stanford_2021] pages 67 - 70: WQ2**
7	**25/4 9-10:45 G1.1.24**	**F) Data Collection, AI, and Regulations** **[Q5] *EU AI Act: first regulation on artificial intelligence*, (European Parliament,2023) [EU_AI_2023]** **1) *Why and How Governments Should Monitor AI Development*, J. Whittlestone et al., (arXiv, 2021) [Whittlestone_2021]** **2) *A Layered Model for AI Governance*, U. Gasser et al. (IEEE Internet Computing, 2017) [Gasser_2017]** **3) *Is effective regulation of AI possible? Eight potential regulatory problems,* J. Danaher (Philosophical Disquisitions, 2014)** **4) *Perspectives on Issues in AI Governance,* Google, 2020 skim through pages 2 - 6; read chapter 4, pages 21 - 25. [Google_2020]** **5) *The Constant Boss: Work Under Digital Surveillance,* A. Nguyen (Data and Society, 2021) [Nguyen_2021]** **6) *Facial recognition technology: The need for public regulation and corporate responsibility*, B. Smith (Microsoft, 2018)** **7) *Solving the Problem of Discriminatory Ads on Facebook*, J. Zang. Brookings Institute. 2021.** **8) *Understanding algorithmic decision-making: Opportunities and challenges 6.1. European level: General Data Protection Regulation*, pages 57 – 60. [Euro_Parl_ 2019]**