Essay

Deadline: July 30, 2021 at 23:59 (German time)

General Remarks

Please make sure to adhere to the following:

- You have to pass this essay in order to get the exam admission. You cannot retake the essay. The essay is ungraded, but especially good essays can receive a bonus of `+0.3` on the final grade.
- You can write your essay in either German or in English. Please decide for one of the two languages and stick to it throughout your essay. If you write in German, you still can and should use the English technical terms from the lecture without translating them.
- Use a suitable font, full justification ('*Blocksatz*'), a font size of 11 or larger, and line spacing of 1.5. Please leave a reasonably large margin for corrections and comments.
- Feel free to write what you personally believe to be correct. Don't try to give answers solely because you think that we would like you to give them. We will not grade you based on whether your answers align with our personal opinion. We will mainly grade you based on your method and your reasoning.
- Your essay must not count more than 3.000 words if you write in English, and 2.700 words if you write in German. Please give the word count on the first page.
- Your essay needs to be your own work. While you are explicitly encouraged to discuss the issues with your fellow students and other people in general, group work is not allowed. If you use any kind of literature or online resources other than the lecture slides, make sure to cite them appropriately. Plagiarism will result in failing the course, no matter whether you plagiarise from a fellow student or from another source.
- Also, please take into account all the information given in the video on essays, which is available in the dcms. A hint: it is not necessarily a good idea to force your argumentative structure such that it matches the approach in the sample essay. Make up your own mind!

You have to write one coherent, appropriately structured text that presents a convincing argument for *one* of the two given topics. Your essay must include the following elements:

Introduction You should give a *short* introduction. It can (but does not have to) include a short summary of what is to come, or of your main idea.

Main argument The core part of your essay is your argument. This is to argue for or against the given claim or a reasonable conditionalization thereof. You should give your argument in extended standard form that is suitably embedded in your text (i.e. not just in the appendix or on the first page without an introduction etc). There should be sufficient reason to believe in the soundness of your argument.

Most promising attack After having presented your argument, you should give the prima facie most promising attack of your argument. If you feel that there is more than one strongest attack, pick one of them. Describe the attack. State which aspect of your argument is attacked *and explain, how the attack can be countered.*

Conclusion In the end, briefly summarize the most important points you made.

Feel free to add other parts if you think that they are helpful for your essay.

Essay Topic I – Hyper-Tracing

Imagine the following hypothetical scenario: Apple, Google, and the German government implement what we will call *hyper-tracing*. In order to keep new Covid-19 outbreaks in control, the geo location of every smartphone with a German SIM-card will always be tracked, and it will be logged which other smartphones are in close proximity. This data will continuously be uploaded to a server, where it will be merged with data sets from the public health offices ('*Gesundheitsämter*'). These data sets can include

- the location, date, time, and result of all official Corona tests that a person has ever taken,
- all dates of known infections that a person had with SARS-CoV-2 and where they were (supposed to be) during this time,
- the location, date, and time of all Corona vaccinations that someone had and which vaccine was used,
- whether there is an ongoing quarantine and where it is supposed to be.

This makes it possible to give users very reliable warnings if they might have contracted Covid, and to recommend them to take a test and/or quarantine themselves. The public health offices can trace infection chains much better with hyper-tracing. This would prevent a lot of Covid-related deaths, hospitalizations, and cases of Long-Covid. The virus would become much less active in Germany, which would make it possible to return almost back to normal, and to enable much more public life. Also, this would result in fewer cases of pandemic-related mental health problems, and would spare many owners of small business bankruptcy.

A downside of hyper-tracing is that it is neither opt-in, nor opt-out, but that it is just the default which is mandated by law: as long as someone is carrying a relatively modern smartphone with a

German SIM-card, they will be tracked, and their location data will automatically be uploaded and merged with their Covid-related data. Mapping smartphones to users is usually not a problem, because German SIM cards have to be registered by the user anyway, using an official document (like their passport). So, it is clear for most smartphones whom they belong to. The reason that there is no opportunity to opt out is this: in order to work well and bring about the desired effects, the system needs the data of a big enough share of the population, and this share is reasonably assumed to be too small if people had the possibility to opt out.

All data is only stored on servers located in Germany, and the data collected from the smartphones will be deleted after two months. Apple and Google promise to not merge any of the hyper-tracing data with their own data bases, e.g. in order to optimize the ads that are displayed to users.

The claim: "It is morally permitted to introduce hyper-tracing."
in German: "Es ist moralisch erlaubt, Hyper-Tracing einzuführen."

Essay Topic II – *Credecent*

Imagine the following hypothetical scenario: In an effort to mitigate discrimination, credit institutes do not longer let (probably biased) humans decide who will be given a credit and who won't, but make their decisions automatically. In this way, certain demographics (like people of colour) are discriminated against much less.

In addition, we assume that one particular system (called "*Credecent*") shows the best performance across all benchmarks. All other decision systems on the market are much less performant than *Credecent* and also much worse in eliminating the discrimination that these systems are supposed to eliminate in the first place. If a particular credit institute used any other decision system on the market, they would have both a much worse payback rate of their credits, would deny more credit applications, and would give out fewer credits to marginalized groups, like people of colour.

Consequently, almost all credit institutes use the very same system, namely *Credecent*. So, if someone won't get a credit (be it for a house, for starting their own small business, or for a surgery) from one bank, they most likely will also not get one from any other bank or credit institute.

However, even *Credecent* is not perfect and it occasionally decides suboptimally. And more: You can even prove that an algorithm will never be fair in all respects.[1] So, no matter which system is used or in what way *Credecent* is improved, it can never be fair with respect to all fairness measures.

Credecent is only used for private individuals and very small businesses, and not to decide about the credits that other businesses or organisations request, which are still handled by humans.

The claim: "For all credit institutes it is morally permissible to use *Credecent*."
in German: "Für alle Kreditinstitute ist es moralisch erlaubt, Credecent zu benutzen."

[1] cf. e.g. Friedler, Sorelle A., Carlos Scheidegger, and Suresh Venkatasubramanian. *On the (im)possibility of fairness.*, arXiv preprint arXiv:1609.07236, `https://arxiv.org/pdf/1609.07236.pdf`, (2016).