Assignment 2a: Probabilistic reasoning over time, implementation instructions and peer review submission

- Inlämningsdatum 19 feb av 23.59
- Poäng 0
- Lämnar in en textimatningsruta
- Försök 0
- Tillåtna försök 2
- Tillgänglig 7 feb kl 17:00–20 feb kl 8:00

Den här uppgiften låstes 20 feb kl 8:00.

UPDATED observation model (uniform sensor failure): **Corrected_ObservationModel_UF.py (https://canvas.education.lu.se/courses/28438/files/4718042?wrap=1) (https://canvas.education.lu.se/courses/28438/files/4718042/download?download_frd=1)**

This is the first part of assignment 2, Probabilistic reasoning over time

Please submit **the relevant parts of your own** initial implementation together with both the **review you got from your peer and your own review of your peer's implementation** in a text entry here (indicate who your peer is!).
DO NOT try to submit any report here!

This task is based on the explanations for matrix based forward filtering operations according to section 14.3.1 of the book and an exercise that was included in chapter 15 of the previous edition of the course book, but you **must adhere to the instructions given below AND those given in the handout**.

In short

You will in the first part of the assignment (this page)

- **analyse the handout material** given to you,
- **implement** robot localisation/tracking based on **forward filtering** and a naïve form of **fixed-lag smoothing** (forward-backward smoothing with a sliding fixed-size window) with a **Hidden Markov Model,**
- **evaluate** your **implementation,** and
- **do a peer review** of someone else's implementation (and get your submission reviewed).

In the second part of the assignment (see **here (https://canvas.education.lu.se/courses/28438/assignments/176769)**), you will then

- **read** a **scientific article** about Monte-Carlo Localisation and
- **write** a report according to the detailed instructions.

Please READ the complete detailed instructions, see below, BEFORE working on the task, there are clear criteria for passing (and failing, actually)!

Make also **use of the office hours / extra periods with the course assistants and myself (Elin)**, if you have questions or get stuck with the implementation!

In detail

You'll find a zip-file containing a) the **detailed instructions**, b) another zip-file with a Python-handout, and c) some sort of user's guide for the viewer tool that is part of the Python handout **HERE (https://canvas.education.lu.se/courses/28438/files/4677341?wrap=1)** **(https://canvas.education.lu.se/courses/28438/files/4677341/download?download_frd=1)** !

Note that the Python handout was fresh for 2021, and has now gone through some revision, but it is still somewhat "new" due to some changes for this year, so please bear with us. If anything is confusing in the documentation or the code, this is most likely due to the transition from the originally provided tools and we are happy to get your feedback!

When your implementation works, find a peer on Discord to get it reviewed by and whom you can review their submission for. It is fine to discuss your thoughts with the peer, but **write down** your review as well. **Making use of any form of AI-based tool** for anything beyond spell- and grammar checking **is not permitted**! Submit the **relevant code snippets (methods you changed things in) of your own initial implementation,** the **review you received,** and **the review you provided** (DEADLINE Feb 19, but of course you can handle this earlier) on this page. Later, include your peer's review of your implementation in your report!

In case you miss this first deadline without a good reason, or receive the mark "incomplete" for this initial submission (your peer review is just some unmotivated statement), you can still submit the final report and implementation, but your submission will get lower priority for being checked - we might thus not manage to handle your submission before the exam, i.e. you might not be able to participate in it.

Failing Criteria (find Passing Criteria with second part of assignment):

Criteria for getting the submission rejected entirely (any single fulfilled criterion is sufficient), i.e. your

submission might not be considered within the time frame of this course occasion (before the exam):

- It is obvious that you have implemented something other than forward filtering / smoothing for an HMM (do not try to implement state-of-the-art robot localisation to impress us, impress us by showing in the report that you know your way around in the material but stick to the task given to you).
- It is obvious that you have used an existing implementation "off-the-shelf" and not really managed to adapt it to your description.
- The implementation is not included in your submission, but linked through Github or similar repositories.
- The report is contained in an archive file together with the code
- Your submission (either implementation, peer review or full submission) smells "placeholder".
- You did not do a peer review without contacting me (Elin) with a good reason (e.g. illness).
- You miss any of the two deadlines without contacting me (Elin) with a good reason (e.g. illness).

Important remarks:

- Remember that the time frame allotted to this assignment is approximately three, maybe up to five, days of your work, so please do not overdo it: a decent program and report will suffice to get a pass (see criteria above). However, in particular if you fail to submit a correctly running program, your report will most likely not be reviewed, thus make sure to get that working before the deadline, not the least to be able to benefit from the peer review.

- You are expected to **work individually**, however, I consider it natural and beneficial to discuss and work together on programming tasks among fellow students. In case you do that even before the peer review, please indicate this clearly in your **report** (who you consulted with and to what level), which **must be written individually**.

- If you decide to **base your solution** (in the sense of heavy inspiration, you **must solve the task yourself** in the end!) on someone else's code (e.g. some library found on the web), please **mention it both in the code and in your report**: it is a matter of academic honesty. Lund University is committed to fighting every case of dishonesty or plagiarism.

- We (teacher and TAs) might have a **closer** look at submissions coming in for the first deadline - do not submit "placeholders" or code snippets that are not your own!

- Going on a skiing vacation or any other trip that is not due to family issues or, e.g. a job interview, is NOT a "good reason" for missing deadlines

If you need advice beyond what fellow students can help you with, contact a TA or me (Elin).