Online control of lab pond setup - fix import weather forecast data

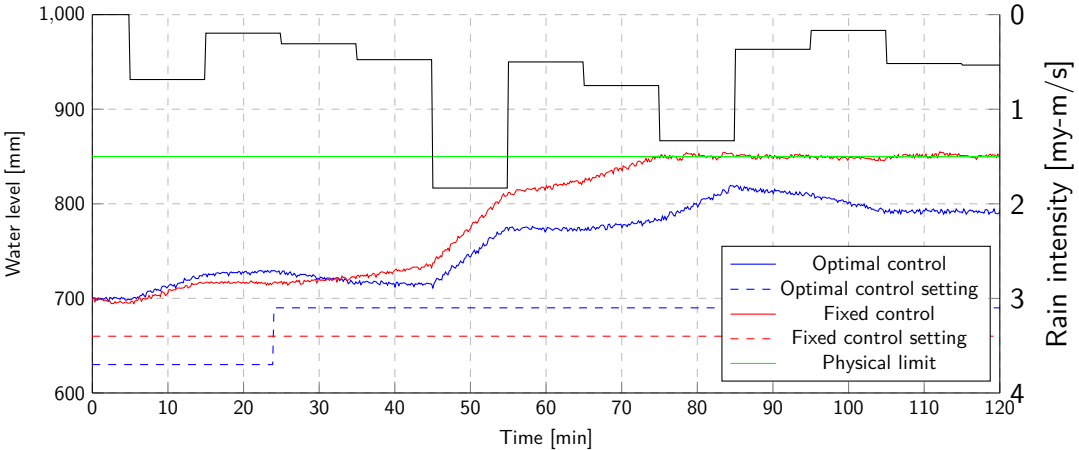
Experiment design and results

September 22, 2023

Experiment design

- Online control: i.e., a strategy is synthesized periodically where the model is re-calibrated to the latest water level sensor reading.
- Experiment duration: 120 minutes.
- Rainfall data: first 120 minutes of the data.
- Initial water level: 700 mm.
- Physical water limit of setup: 850 mm.
- Duration single control period: **20 minutes** (used to be 10 minutes).
- Optimization cost function: min $\mathbb{E}(o)$, where o is the accumulated overflow duration.
- Fixed outflow is setting 2 (approx. 50% of pump capacity).
- Learning budget parameters: –good-runs 100 –total-runs 200 –runs-pr-state 100 –eval-runs 100
- Discretization: 0.01.

Experimental results



Analysis

What has been fixed

- I'm using uppaal-libs to read and import weather forecast data into the Uppaal model.
- The path of the data file was hard-coded for my local machine, but not for the server.
- But Uppaal did not report an error on the server that the path was pointing to a unaccessible location.

Next step

- The results from optimal control are very promising.
- They correspond to expectations.
- Strategies are synthesized between 2-4 minutes.
- Reduce the control interval from 20 minutes back to 10 minutes.