Online control of lab pond setup - smaller control horizon

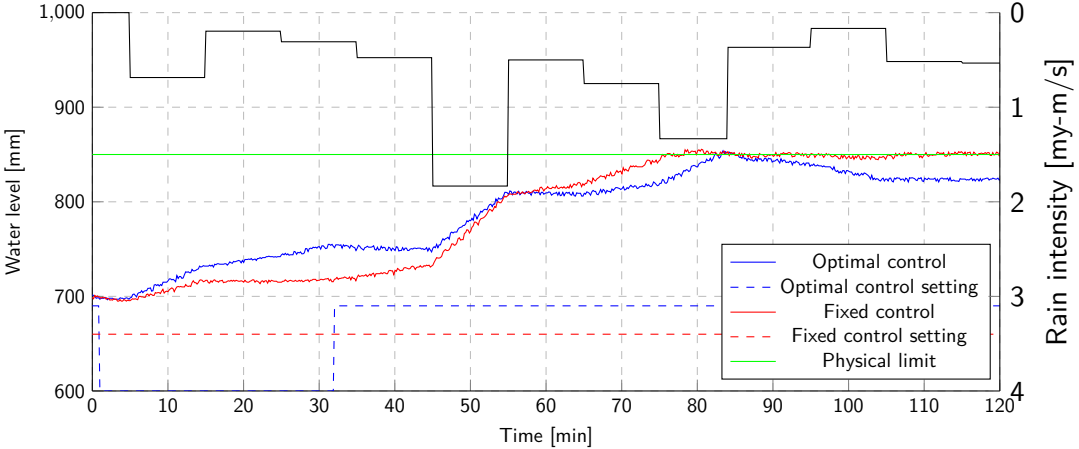
Experiment design and results

October 20, 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: 10 minutes.
- **Control horizon: 60 minutes.**
- Optimization cost function: min $\mathbb{E}(\alpha o + s + c)$, where o is the accumulated overflow duration, s the particle sedimentation, and c is close to overflow; weight $\alpha = 10,000$.
- Fixed outflow is setting 2 (approx. 50% of pump capacity).
- Learning budget parameters: –good-runs 100 –total-runs 150 –runs-pr-state 100 –eval-runs 100
- Discretization: 0.03.

Experimental results



Comparison cost functions