

Online control of lab pond setup - safety bound

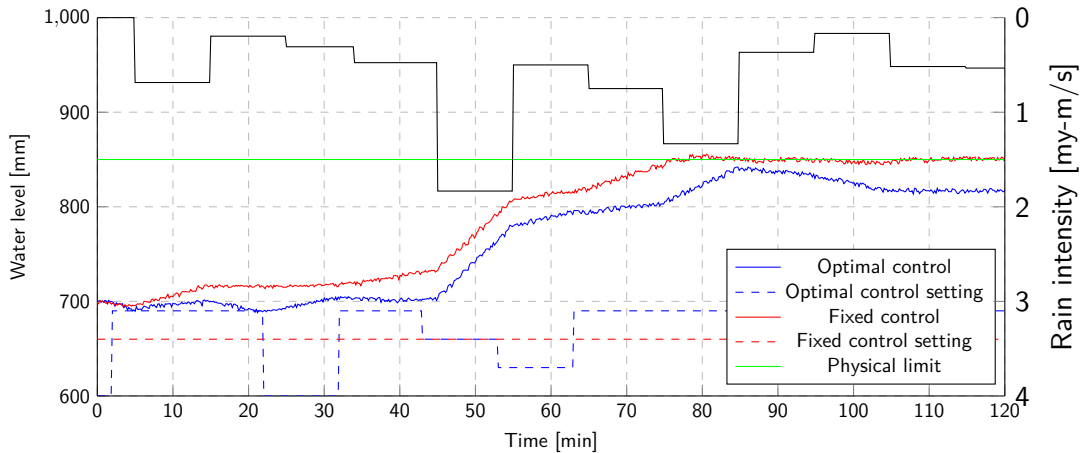
Experiment design and results

October 17, 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.
- **Uppaal water limit of setup: 840 mm.**
- Duration single control period: 10 minutes.
- Optimization cost function: $\min \mathbb{E}(\alpha o + s)$, where o is the accumulated overflow duration and s the particle sedimentation; 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

