Application of Neural Networks for Optimal-Setpoint Design and MPC Control in Biological Wastewater Treatment

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Highlights

- Design of an optimal variable setpoint and a setpoint-tracking control loop for the dissolved oxygen concentration in the BSM1 benchmark.
- Design of a nominal optimal setpoint for the dry weather conditions by solving a nonlinear optimization problem, which minimizes the pollution or the energy usage or both.
- Design of a novel algorithm that adjusts the setpoint dynamically during weather events (responding appropriately to significant changes in the influent)
- Design of a constrained nonlinear model predictive control that tracks the designed setpoint.