Performance of auto-calibration algorithms in the field of urban drainage modelling

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Challenges

• Model calibration is a time consuming and complex task
• Calibration algorithms: LM, PSO, GA,...
• Objective functions: E, SSE, ...
• Testing of possible solution candidates and evaluating one or several objective functions
• Find global optimum within the fitness landscape which is defined by objective functions
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Performance:

• Number of needed iterations within a calibration ? (Speed)
• Impact of objective function on computational performance ? (Speed)
• Ability to identify the optimum ? (Accuracy)
Benchmark system

Real system (calibrated UDM) → Generate uncalibrated model → Initial model

Initial model → Model calibration → Calibrated model

Calibrated model → Real system (calibrated UDM)
Generated uncalibrated models
Results after model calibration
Number of iterations

Objective function / optimisation algorithm

- E/ILM
- SSE/ILM
- EPSO
- SSE/PSO
Summary

Automatic performance tests of calibration algorithms with different objective functions
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Model independent (using Calimero framework)
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PIs: Computational performance and accuracy of calibration
Thank you

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Generated uncalibrated models