Master Thesis
Distributed Computing and Systems

Efficient multicore data-stream analysis & processing in cyber-physical, IoT-based (e.g. vehicle/energy) systems

(4 related projects, 1-2 students each)

Motivation

Cyberphysical, IoT-based systems involve large volumes of data generated continuously, in a stream-fashion; their analysis can give information valuable for the physical systems, for better resource planning, warnings and more. E.g.

- detecting obstacles from data streams from Lidar sensors on a vehicle can improve automated, safety-related functionality;
- monitoring events in a distributed cyber-physical system can give early warnings for e.g. dangerous situations.

Such information must be available in near-real-time, hence highly efficient analysis methods and efficient processing on multicores is a must.

Challenge

This thesis area is on
(i) efficient methods to analyze data-streams (eg from high-rate sensors or from many lower-rate sources) and
(ii) efficient implementations/programming of them in multicore systems.

The above is basis for more than 3 thesis projects, for 1-2 students each; e.g. the choice of focus can be on (a) parallelism in clustering/analysis methods; and/or on (b) concurrent data structures to facilitate multicore processing; and/or on (c) use of stream-processing engines eg Apache Storm for the analysis; and/or (d) combinations of the above, in use-cases based on open data-sources.

Feel free to contact us for discussing the possibilities.

Background & Requirements
- Computer Science or related programs
- Courses in algorithms/data-structures, OS, distributed systems, or related
- Experience with programming
- Strong motivation for high-quality work involving programming & analysis.

Environment
We offer you a stimulating work atmosphere and motivated advisors.

Contact
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