

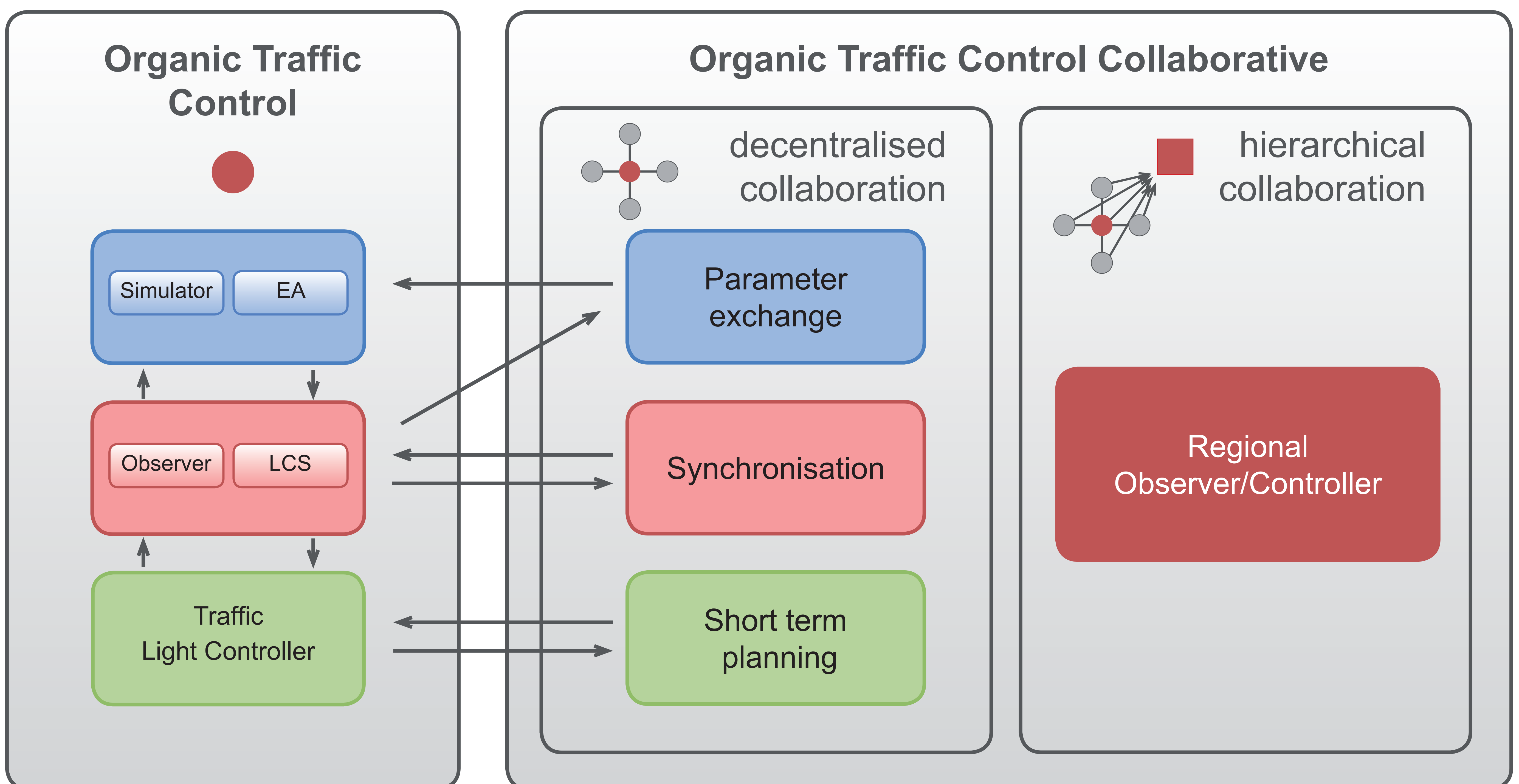
Organic Traffic Control Collaborative (OTC²)

DFG SPP 1183 Organic Computing (www.aifb.uni-karlsruhe.de/EffAlg/Projekt/otcqe)

A research cooperation between the Institute of Applied Informatics and Formal Description Methods, Karlsruhe Institute of Technology (KIT), and the Institute of Systems Engineering – System- und Rechnerarchitektur, Leibniz Universität Hannover

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Organic Traffic Control Collaborative (OTC²) aims at the realisation of an organic traffic control system capable of controlling and optimising traffic signals in urban road networks. In the predecessor project OTC an architecture for an adaptive learning node controller has been developed. This architecture is to be extended to allow for collaboration among the node controllers, which is a prerequisite for a network-wide optimisation. Hierarchically organised and completely decentralised approaches to the control problem will be designed and thoroughly investigated.



Decentralised collaboration

✖ Short term planning

Traffic light controllers communicate in advance when vehicle platoons will leave the intersection, thereby creating an *extended sensory horizon* for neighbouring nodes. Traffic-responsive controllers use this data for an *improved short term planning*.

✖ Synchronisation

Neighbouring nodes communicate the strength of their traffic movements along with characteristics of their signal programme to *dynamically establish synchronised traffic lights* for the most important traffic streams in a network.

✖ Parameter exchange

It will be investigated if the exchange of parameter sets among nodes of similar topology helps to *speed up the optimisation process*.

Hierarchical collaboration

Regional observer/controller components obtain a *high-level view of the network's traffic* and use this knowledge to influence node controllers in their area of responsibility. Special attention is paid to accomplish *network-wide goals*.

It will be investigated if a *combination of decentralised and hierarchical collaboration* is beneficial for the traffic control system.