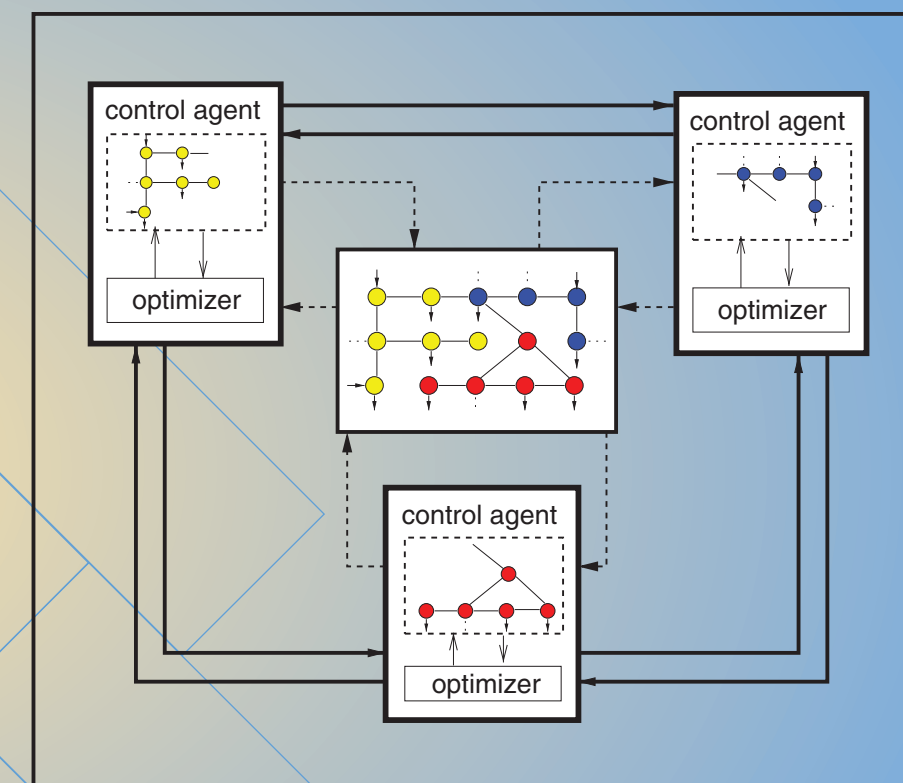




Transportation networks, such as power networks, road traffic networks, water distribution networks, railway networks, etc., are the corner stones of our modern society. As transportation networks have to operate closer and closer to their capacity limits and as the dynamics of these networks become more and more complex, control of these networks has to be advanced to a higher level using state-of-the-art control techniques. Such control techniques should be able to deal with the large size and distributed nature of the control problems encountered, and should in addition be able to anticipate undesired behavior at an early stage.

In this PhD thesis several novel control techniques for the control of transportation networks are proposed. Each of the techniques proposed is based on a combination of ideas from the fields of multi-agent systems and model predictive control. Control problems from the domain of power networks are used to illustrate and assess the performance of the proposed techniques.

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