

This thesis and technical report concentrates on distributed control using a distributed model predictive scheme. The model of a two room house and three room house is build and a distributed model predictive control (MPC) algorithm is implemented in order to reach specified room temperatures with minimized energy effort in each room. For reference tracking Target Calculation and the delta input scheme are used. The MPC optimization problem is solved at each time step through an iterative method, where the number of iterations is reduced through a stopping criterion guaranteeing stability and an prespecified amount of performance and feasibility. The optimization problem is divided up into subproblems, where each subproblem takes less computational effort than the central optimization problem. Due to the possibility of coupling between subsystems, communication between the subsystems is needed. The reference values are reached and iterations needed to solve the optimization are reduced with the stopping condition. This method saves computing time and gives privacy to each subsystem, since only required information is communicated. Also the subsystems get less susceptible to the failure of one coupled subsystem, since if one subsystem fails, the others could go on. But, due to the needed communication, this method is more suitable for large systems with sparse coupling. For a small system, or too much coupling the communication effort will get to high.