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Analyzing network dynamics through graph partitioning

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Stellingen
behorende bij het proefschrift
**Analyzing Network Dynamics
through Graph Partitioning**

van

Shuo Zhang

1. There is no partition of which the characteristic matrix can completely characterize the controllable subspace of a single-integrator diffusively coupled network. (*Remark 2.4.9*)
2. The distance partition can fully characterize the controllable subspace of a single-integrator diffusively coupled network with a distance regular topology and a single leader. (*Proposition 2.5.2*)
3. A diffusively coupled network with a complete topology requires more leaders to be controllable than with any other connected topology consisting of the same number of agents. (*Theorem 2.5.8*)
4. In a heterogeneous diffusively coupled network with double-integrator agents, if a pair of agents can reach velocity consensus, they must be connected by a path in the union of the position and the velocity graph. (*Theorem 4.3.12*)
5. The graph theoretical condition to solve the disturbance decoupling problem of diffusively coupled networks (if satisfied) directly tells how to synthesize a state feedback which only requires the relative information between the states of agents. (*Chapter 5*)
6. "Obvious" is the most dangerous word in mathematics. (*E. T. Bell*)
7. How is an error possible in mathematics? (*Jules H. Poincare*)
8. Beauty is the first test; there is no permanent place in the world for ugly mathematics. (*G.H. Hardy*)
9. Drama is imagination limited by logic. Mathematics is logic limited by imagination. (*Nathan Campbell*)
10. The moment I realize I do not understand something is the moment when I begin to understand.