Stellingen
behorende bij het proefschrift

Energy-based control design for mechanical systems
Applications of the port-Hamiltonian approach

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1. For standard mechanical systems in the port-Hamiltonian framework, a change of variables can be realized such that the new system includes measurement of forces in the new passive output, with structure preservation for the closed-loop system.
   This thesis, Chapter 3

2. In comparison with force feedback in the Euler-Lagrange framework, force feedback in the port-Hamiltonian framework has nicely interpretable control strategies, as well as cleaner tuning opportunities that grant a better performance.
   This thesis, Chapter 3

3. In a noncontact to contact transition, force control is employed to deal with the steady-state response of the system, while impedance control is used to manage transient behavior of the grasping.
   This thesis, Chapter 4

4. The grasping strategy based on a virtual spring with a variable rest-length leads to a (co)dissipation term in the impedance grasping controller, which is needed to obtain a smoother noncontact to contact transition.
   This thesis, Chapter 4

5. The port-Hamiltonian framework allows extensions of the dynamics of the systems. An extended model that interconnects the dynamics of a vision system via an adapted momenta, plays a key role in order to asymptotically stabilize the system to a desired position.
   This thesis, Chapter 5

6. A rejected paper is not the opposite of an accepted one, but a part of it. *Free interpretation of Haruki Murakami's: "Death is not the opposite of life, but a part of it".*

7. Robotics was developed on Earth. The Mars Exploration Rover Mission has demonstrated that it was never meant to die here. *Free interpretation of Interstellar (film), 2014: "Mankind was born on Earth. It was never meant to die here".*

8. Living on the edge of your own contradictions asserts your own liberty.

9. Taking negative feedback is a waste of time except in control theory.

10. Love is observable but not controllable.