



## Bachelor or Study Thesis

**(English)**

# **Systematic investigation of different geometries for an adaptive rover wheel**

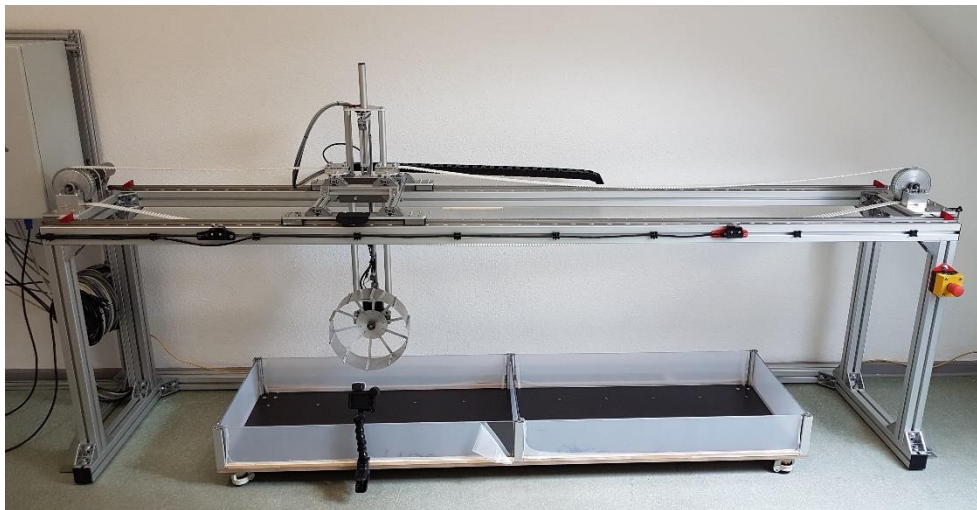


Fig: 1: Single Wheel Testbed

Planetary rovers, such as the NASA's Perseverance rover, rely on wheels to move over the surface of the Mars or other planets. Rover wheels have the disadvantage that they are subject to slippage and sinkage reducing the locomotion performance of the rover. To maximize the locomotion performance, the geometry of the wheels needs to be tailored to the properties of the planet's surface. However, planets feature a variety of surface types making it difficult to find a suitable wheel design. A solution are adaptable wheels which can adapt their geometry to the current terrain properties improving the locomotion performance of the rover.

In this thesis, a systematic study is conducted to evaluate the performance of different wheel geometries on various terrain types. For this purpose, wheels with different geometries will be designed, printed, and tested on the Single Wheel Testbed (see Figure 1) at our institute.

Contact: M.Sc. Simon Harms  
Tel. 0531 391 9977, E-Mail: [simon.harms@tu-braunschweig.de](mailto:simon.harms@tu-braunschweig.de)  
Hermann-Blenk-Str. 23, 38108 Braunschweig

Aditya Thakur, PhD  
Tel. 0531 391 9974, E-Mail: [aditya.thakur@tu-braunschweig.de](mailto:aditya.thakur@tu-braunschweig.de)  
Hermann-Blenk-Str. 23, 38108 Braunschweig