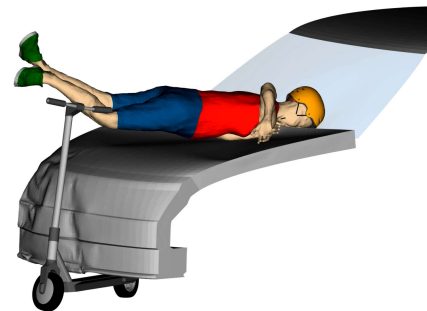




## Vulnerable road users- personal protective equipment to reduce the injury severity.

### Background

Worldwide, more than 50% of the 1.35 M road users killed annually, are vulnerable road users (VRUs) such as pedestrians, cyclists, motorcyclists and e-scooter rider. To minimise the consequences of an accident for VRUs and to reduce the severity of injuries, personal protective equipment (PPE) plays a major role. To investigate the influence of different PPEs on the injury risk for VRUs, Human Body Model (HBM) simulations can be carried out. However, it is necessary to have a validated Finite Element (FE) model of the PPEs. Therefore, FE models of PPEs for vulnerable road users should be developed. With the help of these FE models, the influence of personal protective equipment on the injury severity should be evaluated with the help of HBM FE-Simulations.



**Your goal** in this thesis is to develop FE models of PPEs. Therefore, in a first step the dimensions and material characteristics should be determined in laboratory tests. After creating 3D-CAD models of different PPEs FE models should be created. This FE models should be validated with the material data collected in the laboratory tests.

### Tasks

- **Get familiar** with laboratory tests, material characteristics and FE modelling.
- **Selection** of PPEs relevant for vulnerable road users.
- **Perform** laboratory tests to determine the dimensions and material characteristics of different PPEs.
- **Development** of FE models for the different PPEs.

### Topic as thesis for

Master Thesis for Mechanical Engineering or Production Science and Management

### Organizational

- Start: anytime
- Language: German or English
- Scholarship **only for Master Thesis**: min. € 2.500, - for successful completion of the thesis
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