

Graduation project:

Design of the steering mechanism for the RooT electric scooter

Introduction: The advantages of electric mobility are more widely recognized than before. Clearly the future belongs to efficient, noise- and pollution-free vehicles that run on renewable energy sources. However most fully electric vehicles on the market today fail to translate their advantages into a more desirable user experience, offering merely a different technology with new downsides.

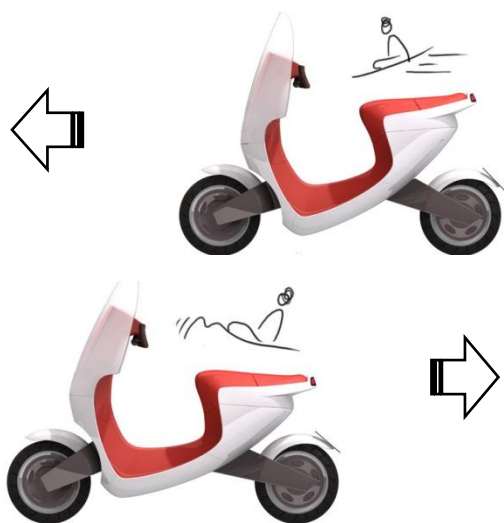


figure 1: the RooT “flying carpet”: left: acceleration and right: deceleration.

Explanation of the technology: The RooT is an electric scooter designed to create a new user experience that enhances the advantages of electric mobility: it is quiet, clean and intuitive. It moves with you like a “flying carpet”.

To create this feeling a new innovative mechanism is introduced which tilts forward when accelerating and tilt backward when braking (figure 1). It does so by means of a bar-mechanism suspension which tilts to the appropriate angle using the momentum of scooter and driver, in other words without the use of actuators.



figure 2: left: instantaneous pole position of the mechanism, right: the test-rig to test the tilting on the perceived comfort.

A prototype has been built in a PAP assignment (figure 2) and confirmed that this mechanism can create the flying carpet motion.

Assignments: To integrate this mechanism into a production scooter it requires two lines of development, defined in the following two graduation assignments:

Combine the tilting mechanism with a steering solution