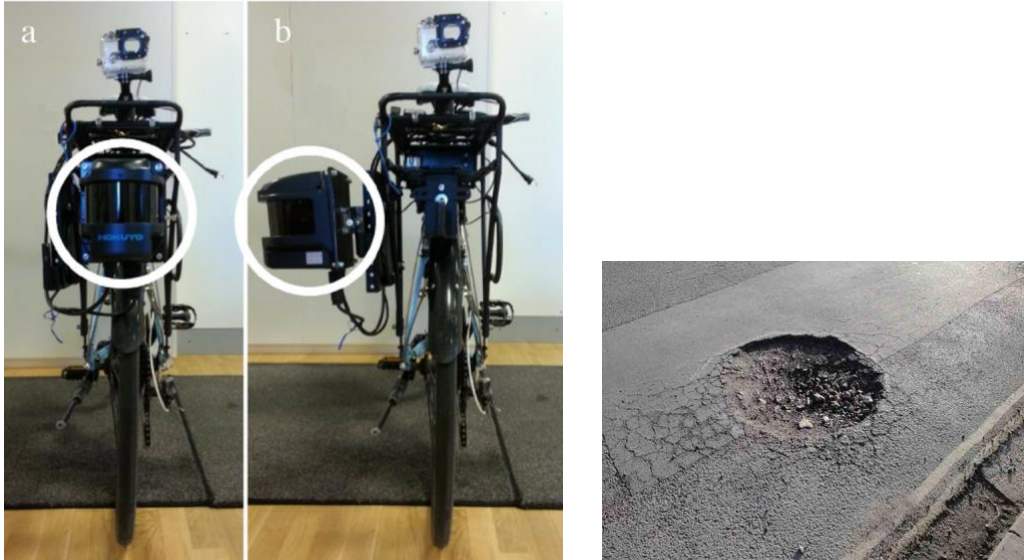


MSc project proposal
Bicycle load cases



For the structural design of bicycles, it is crucial to have representative load cases. The current tests (HCF and ISO) are historically grown and often do not representative the experienced load cases during daily usage. A more realistic set of load cases could improve the design of bicycles. Modern e-bikes have sensors which are able to measure the forward speed, the angular speed and linear acceleration of the rear frame, the pedal torque support level, and the ambient temperature, at a sample rate of 2 seconds. With the help of IoT technology we would like to explore if these sensors can help to develop the load cases as they are experienced by our fleet. As a parallel step you can also think of a system which with the help of the sensors and the IoT can give information on the actual road quality like potholes and unevenness.

Assignment:

Your assignment will be to get yourself familiar with the modern e-bike and its current sensor setup and capabilities. Develop a method to determine the loading from the kinematic data and other parameters. Test your method in a number of used cases. Next develop a system which uses the sensors to determine the road quality and share that via IoT.

Supervisors:

- Arend L. Schwab, TU Delft, 3mE/BmechE, a.l.schwab@tudelft.nl
- Jason Moore, TU Delft, 3mE/BmechE, j.k.moore@tudelft.nl
- Richard Müller, Royal Gazelle, r.muller@gazelle.nl