Bachelor’s final project

The accuracy of a 2D PTV based flow rate measurement in microchannels

Particle tracking velocimetry (PTV) has been commonly used for velocity measurements in microfluidic applications. The principle of the method is to measure the flow by recording and tracking tracer particles in a flow via a microscope. In this project, the student will be asked to measure the velocity in a water-filled-microchannel that has a rectangular cross section by using a 2-dimensional (2D) PTV method. From the measurement results, the average mass flow rate in the channel can be estimated mathematically. With the comparison of the experimental data and the prescribed mass flow rate, series of analyses can be done, especially to determine the accuracy of the method and possible improvements.

The aim of the project is to compare the real mass flow and the estimated mass flow by using 2D PTV.

Requirements for this project: The bachelor student should have a background in mechanical engineering, knowledge of basic fluidic mechanics, and basic MATLAB programming skills.

Contact: Chuan Nie (c.nie@tue.nl, GEM-Z 3.123)
Dr. Arjan Frijns (A.J.H.Frijns@tue.nl, GEM-Z 2.124)
Prof. Dr. Jaap den Toonder (J.M.J.d.Toonder@tue.nl, GEM-Z 3.130)