Master thesis

To students at the Technical Faculty

(Computational engineering, Medical Engineering, Maschinenbau)

FAU
Friedrich-Alexander-Universität
Erlangen-Nürnberg

Title: Computational flow dynamics for standing surf-waves

Standing river waves are becoming more and more popular for surfing. For receiving a working, i.e. surfable wave, several boundary conditions have to be considered as overall geometry, topology of the floor behind the wave, inflow conditions, height of fall, water velocity. The goal of this work is to analyse, for a given basic geometry, fluid varying characteristics for different settings like
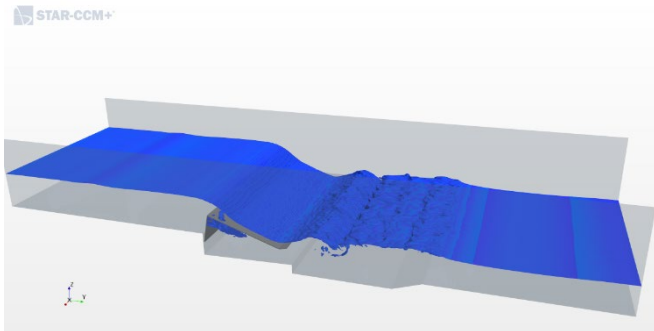
topology of floor and sidewalls, inflow conditions. The CFD model will be implemented in STAR-CCM+ using nonstationary fluid dynamics.

The tasks are to (1) accurately define boundary conditions of the entire wave model and implementation in STAR-CCM+. (2) Performing parameter studies by varying boundary conditions (e.g. geometry of floor and sidewalls, inflow) to generate different flow conditions as e.g. back-streaming, no back-streaming, additional water barrels or a perfect condition (i.e. smooth wave surface with only few vortices).

The work will be supervised by **Prof. Dr.-Ing. Michael Döllinger (Member of Department Informatik)** and **PD. Dr. Stefan Kniesburges (Laboratory CM I)**.

We search for a dedicated and motivated student with

- experience in CFD modeling and simulation
- knowledge and experience in scientific programming in the field of fluid dynamics

Tasks:

- Enhancement of the basic CFD model in STAR-CCM+
- Numerical parameter studies as described above

Contact persons:

Prof. Dr.-Ing. Michael Döllinger (michael.doellinger@uk-erlangen.de / Tel. 09131-85 33814)

PD Dr.-Ing. Stefan Kniesburges (stefan.kniesburges@uk-erlangen.de / Tel. 09131-85 32616)
University Hospital Erlangen