

Scientific Visualization – Exercise 3

DEADLINE: SUBMIT YOUR SOLUTION BEFORE MONDAY, NOVEMBER 24TH, 09:00.

Prerequisites

For this assignment you will need VTK. VTK can be downloaded for free from <http://www.vtk.org/> but it is also installed on the dual-boot PCs at Science Park (both for Windows and Linux).

This assignment consists of a challenge that needs to be solved through visualization. Solve the challenge and submit a report that explains your approach. Submit your solution through Blackboard.

Submit one report per group pair. Make sure you mention both your names and student numbers in the report.

Introduction

Download the dataset from <http://bit.ly/1uESaMC>

This dataset represents flow through a “static mixing reactor”. These reactors are used in industrial application for the mixing of very viscous fluids. The dataset is a regular structured (“cartesian”) grid consisting of two data arrays:

- **scalars:** this represents the geometry of the mixer: the value 10 represents cells that are part of the mixer, 0 represents cells that do not.
- **vectors:** this is a static 3D vectorfield that represents a simulation of flow through the reactor. The vectors represent the direction and velocity of the flow.

Assignment

The objective of this assignment is to produce an image that shows, by visualization, whether the mixing reactor is capable of mixing two fluids. The image should at least show the following:

1. The morphology of the reactor;
2. The capability of the reactor to mix two fluids;
3. The flow velocity around the reactor.

Hand in (via Blackboard) a short report (max 2 pages) that shows your visualization, the VTK pipeline that produced the visualization and explains the decisions you made in solving this assignment. Also submit your code. Discuss the effectiveness of your visualization.