

# Explorative Visual Analysis of Spatio-temporal Regions to Detect Hemodynamic Biomarker Candidates

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## Abstract

Biomarkers are measurable biological properties that allow for distinguishing subjects of different cohorts such as healthy vs. diseased. In the context of diagnosing diseases of the cardiovascular system, researchers aim - among others - at detecting biomarkers in the form of spatio-temporal regions of blood flow obtained by medical imaging or of derived hemodynamical parameters. As the search space for such biomarkers in time-varying volumetric multi-field data is extremely large, we present an interactive visual exploration system to support the analysis of the potential of spatio-temporal regions to discriminate cohorts.

In this poster, we demonstrate our approach based on a sepsis study, conducted by our collaboration partners. The goal hereby is to analyze the effect of sepsis in mice with respect to selected hemodynamic parameters. In this case, a segmentation of the pulmonary artery was performed on 4 baseline animals and 3 with acute sepsis. We were provided with velocity vector fields acquired using 4D-PC-MRI from which we calculate vorticity magnitude and wall shear stress (WSS) for the analysis.

