



Contribution ID: 141

Type: **Talk (15min + 5min)**

Developing user-centered research software for aeromedical image analysis

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Cine cardiac magnetic resonance imaging (cineCMR) is a well-established imaging modality that is widely used in clinics and research centers to evaluate vital parameters like the exact stroke volume in the left and right ventricle or blood flow in the aortic root. By significantly shortening the recording times of individual images, it is now even possible to examine influences such as respiration, arrhythmia or severe heart disease using so-called real-time MRI. As this is currently only research hardware, there is little or no software for analyzing recorded data (semi-)automatically.

As shorter recording times significantly increase the amount of images, manual analysis by medical professionals is increasingly inefficient. Although frameworks such as nnU-Net significantly simplify the use of machine learning for the automatic analysis of medical image data for scientists, customized software solutions are needed to improve human-machine interaction.

RCInsight is a research software developed at the Institute of Software Technology and the Institute of Aerospace Medicine within the German Aerospace Center. It is intended to enable research into the effects of aerospace environments on the cardiovascular system by utilizing recorded real-time MRI data. Developed in the *Scalable Machine Learning* group of the *High Performance Computing* department, we are not only researching the productive use of state-of-the-art machine learning models, but also the collaboration between end user and model.

We showcase how *RCInsight* is currently used for both research in aerospace and clinical applications and how we intend to cover the entire data pipeline from capturing to reporting in a transparent, reliable, interactive and high-performance manner. For that we present our web service, that allows users to monitor pipeline progress, investigate interim results and potentially interact with the pipeline configuration.

I want to participate in the youngRSE prize

yes

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Session Classification: Research Software working on Medical Data

Track Classification: Research Software: visualisations and analysis