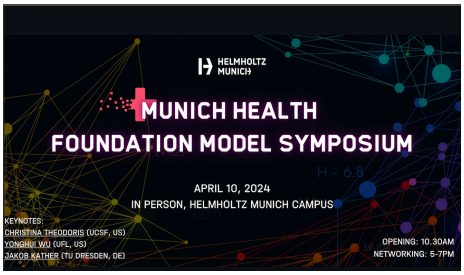

Contribution ID: **37** Type: **Talk**

Foundation model for human heart simulation and analysis of the pathological changes

Nowadays, cardiologists and even practitioners are using different methods to evaluate the state of human heart. However, these possibilities do not mean that the patient is always secure during the diagnosis process. One of the important procedures is Right Heart Catheterization (RHC) that is consumed during the diagnosis process of pulmonary hypertension (PH). However, the problem with this method is that this is one of those that are not secure for the patient (despite its precision and effectiveness). It can lead to heart stoppage or lung collapse. Both these situations are live-threatening and can even lead to the patient's death. It is why, new technologies and new solutions are needed to overcome the problem of possible live-threatening situations that can occur in the diagnosis process. The idea that we would like to present is connected with simulation tools. The goal of the work is to propose a 3D simulation model that will consume results from safe methods (like MRI, CT or ECG) to simulate the whole organ. We will be then able to observe how the heart is beating and what kind of issues are observable (e.g., arrythmia or necrosis of heart muscle's part). However, we are totally aware that each heart is different (it has some specific, individual traits). It is why, we would like to propose to create general, foundation model for human heart simulation. In this work, we would like to present the initial results that are connected with literature review and collection of the samples as well as design, implementation and evaluation of the first, simple models. The worked-out foundation model will be directly used for analysis of individual human heart –it means that it can be further trained to develop individual traits of a specific organ. Moreover, in our work we are making a comparison with Windkessel models that are traditionally used for simulation of different parts of the human heart.

Primary author: SZYMKOWSKI, Maciej (Łukasiewicz Research Network - Poznań Institute of Technology)

Session Classification: Break + Posters session

Track Classification: Poster