

Master-/Bachelorthesis

Prototyping Smart Vessel Phantoms for a Modular Catheter Test Bed

Head

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Background: At HERA a physical smart simulation environment for the training of medical continuum robots and catheters will be developed.

Problem: A lot 3D printed replications of various organs are available for different purposes. Although these phantoms are often based on real physiological data from medical images, in most cases they are designed only for visualization purposes and teaching. They rarely support functionality for testing instrumentation and training of robotic instruments.

Task: Your task will be the design of a method to replicate (parts of) the human main blood vessels from actual medical imaging data to a modular, physical phantom with different levels of morphological abstraction. Right from the beginning the integration of force sensors should be taken into account. Different blocks should be combinable to phantoms which can be used by medical students or automated instruments as training environment. Through the integration of sensors, the phantom should allow for feedback regarding the performance of catheter guidance. Depending on your interest different focus can be set either on the prototyping or sensory part. You will work in an interdisciplinary environment and your work can also involve the exchange with medical experts.

For the realization of your work our institute offers an electronic, mechatronic and 3D printing lab as well as an in-house mechanical workshop with a mechanic.

If you think this work could be in your field of interest or if you want to know more, feel free to contact **Christian Marzi**:

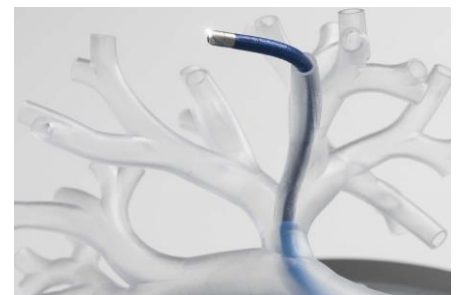
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Catheter test bed of Fraunhofer
IPA Mannheim



Vascular Phantom of Human X



Auris Health Monarch Plattform