

# Filtering and Compensation of Electrical Impedance Tomography Reconstruction Artifacts

Type	masterthesis
Workingtitle	Investigations into the compensation of reconstruction errors in known structures due to missing electrodes in electrical impedance tomography

Electrical impedance tomography is a non-invasive procedure that enables the visualization of pulmonary ventilation by stimulating and measuring weak currents on the body. For meaningful imaging, the patient's thorax must be completely enclosed by the EIT electrode belt. However, the artifacts that arise when only part of the body is fitted with electrodes make it difficult to use the method in intensive care scenarios where the upper body is only partially accessible. Initial investigations at ICCAS have shown that it is possible to approximate these reconstruction errors depending on the missing electrodes. Therefore, methods are now to be designed and investigated which compensate for artifacts depending on the number of applied electrodes and enable a reliable statement on the patient's ventilation situation despite partial electrode application.

The work includes an initial familiarization with the topic of EIT and the means available at ICCAS for carrying out measurements, reconstructions and simulations. On the basis of research results on the state of the art in the fields of inverse model adaptation and image processing, methodological approaches must then be developed and investigated. Finally, verified functions must be combined into a processing chain and evaluated using measurements under laboratory conditions.

## Requirements

- Master's degree in a natural science or engineering degree program
- Experience in programming (Matlab/Python/C++) required
- Experience in image and signal processing is an advantage
- Experience with models for solving inverse problems an advantage

## Contact

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