



Master Thesis Plan / KfK*

Medical University of Vienna, Austria – Research Group of Priv.-Doz. Dr. Thomas Schlöglhofer, MSc
Center for Medical Physics and Biomedical Engineering

Start Date: WS 2026/2027

Thesis Overview:

The interdisciplinary **Research Group** of Priv.-Doz. Dr. Schlöglhofer at the **Medical University of Vienna** is seeking a highly motivated Master thesis' student candidate to join an interdisciplinary research project focusing on advanced heart failure and Mechanical Circulatory Support (MCS).

This internship offers a unique opportunity to work in high-impact healthcare investigation at the interface of clinical research, biomedical engineering, and cardiovascular physiology.

This master's thesis project focuses on the development of an automated software workflow for processing multimodal medical imaging data from patients undergoing MCS therapy. Imaging modalities may include chest X-ray, computational thermography, and transthoracic echocardiography.

The objective is to develop a tool capable of automatically processing DICOM imaging files, extracting anatomical landmarks and device position markers, and generating structured imaging-derived markers for future clinical data analysis. The developed workflow aims to facilitate the identification of MCS device malposition, longitudinal device position changes, and cardiac remodeling. In a subsequent step, extracted imaging markers may be correlated with postoperative hemocompatibility-related adverse events and clinical outcomes.

Background:

- Enrolled in Medical Informatics or comparable Master's study program
- Proficiency in MATLAB required; Python/R beneficial
- Experience in data analysis, imaging processing, and machine learning
- Interest in cardiovascular physiology and medical device research
- Excellent communication skills in English (German beneficial but not required)
- Ability to work independently and within a multidisciplinary team

* KfK-Seminar and KfK-Internship can be done as preparation for the Master Thesis in our research group



Recommended literature:

- [1] G. Widhalm *et al.*, "Preoperative anatomical landmarks and longitudinal HeartMate 3 pump position in X-rays: Relevance for adverse events," *Artif. Organs*, vol. 48, no. 12, pp. 1502–1512, 2024, doi: 10.1111/aor.14837.
- [2] A. M. Bernhardt *et al.*, "Clinical Management of the Impella 5.5 Pump," *J. Heart Lung Transplant.*, Jun. 2025, doi: 10.1016/j.healun.2025.06.008.
- [3] A. Chaturvedi, Y. Rotman, T. Hoang, G. Jew, A. Mandalapu, and C. Narins, "CT and chest radiography in evaluation of mechanical circulatory support devices for acute heart failure," *Insights Imaging*, vol. 14, no. 1, p. 122, Jul. 2023, doi: 10.1186/s13244-023-01469-8.
- [4] L. Baldetti *et al.*, "Comprehensive Cardiac Imaging Before and During Microaxial Flow Pump Support for Cardiogenic Shock," *JACC Cardiovasc. Interv.*, vol. 18, no. 16, pp. 1955–1970, Aug. 2025, doi: 10.1016/j.jcin.2025.06.040.

For informal inquiries, please contact

Priv.-Doz. Dr. Thomas Schlöglhofer, MSc | thomas.schloeglhofer@meduniwien.ac.at

Tommaso Dorigatti, MSc | tommaso.dorigatti@meduniwien.ac.at

Lukas Ruoff, MSc | lukas.ruoff@meduniwien.ac.at

Phone: +43-1-40400-27280