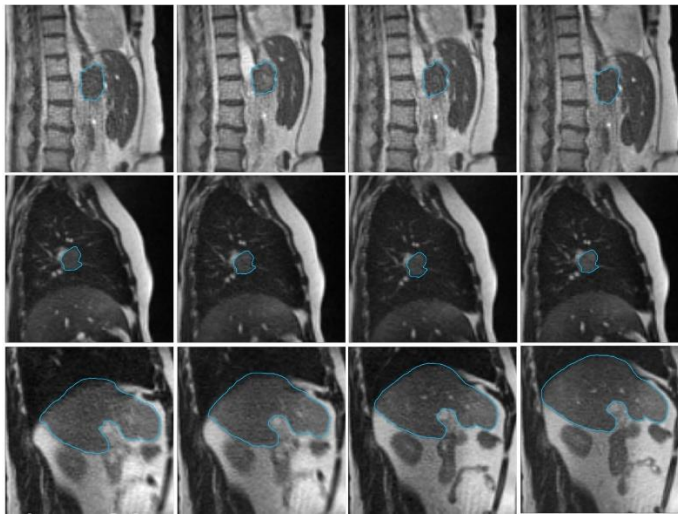
Local Therapies



Cancer treatments such as surgery, radiotherapy, and interventional procedures rely on **precise imaging** to locate tumors, guide therapies, and monitor treatment response. However, the complexity of medical imaging—spanning technologies like CT, MRI, and endoscopy—creates challenges in standardization and interpretation. Our lighthouse project within the **BZKF** brings together experts across multiple disciplines to develop **AI-supported imaging solutions** that enhance **local cancer therapies** and improve patient outcomes.

Current Situation

Recent advances in **artificial intelligence (AI) and image-guided interventions** are leading to **more precise, individualized cancer treatments**. However, differences in imaging modalities mean that AI solutions must be tailored to each setting, making standardization difficult. Additionally, the medical questions addressed by AI-driven imaging require **close collaboration between technical and clinical experts**. This lighthouse project will build a strong network across BZKF sites to advance AI for image-guided cancer therapy.

Areas of Activity

Our initiative is focused on:

- **Developing AI-driven image analysis** to improve tumor detection, motion tracking, and treatment planning
- **Enhancing real-time imaging technologies**, such as MRI-based motion management and AI-supported lesion tracking

🔷 **Creating standardized, high-quality imaging data** across BZKF centers to enable collaboration and innovation

🔷 **Optimizing image guidance for multiple local cancer therapies**, including radiotherapy, interventional radiology, surgery, and endoscopy

By pooling expertise across **radiology, radiation oncology, surgery, endoscopy, physics, and computer science**, we will develop **synergistic AI solutions** that reduce redundancies, enhance treatment precision, and improve patient outcomes.

Long-Term Goals

Our vision is to establish **AI-supported image guidance** as a standard for **local cancer therapies**, including tumor detection, outcome prediction and interventional approaches across BZKF centers. Over the next two years, we aim to:

✅ **Link with the existing AI/bioinformatics lighthouse** to enable AI-driven **imaging solutions**

✅ **Expand collaborations across all BZKF sites** to ensure these innovations benefit a wide range of cancer patients

✅ Create a and deploy a unified **foundational AI model** for cross-modality **image segmentation**, to ensure consistency and interoperability in imaging research across BZKF centers.

Speaker

This lighthouse project is **coordinated at LMU Klinikum München** under the leadership of **Prof. Guillaume Landry** (Department of Radiation Oncology) and **Prof. Michael Ingrisch** (Department of Radiology), with active participation from all six BZKF centers.

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