

LivoXpert

(abstract)

Liver tumor detection and treatment present significant challenges in modern healthcare. Traditional methods, where radiologists manually analyze scans to detect tumors, often require over 30 minutes, delaying critical treatments. Early-stage tumor detection is also nearly impossible with current techniques, further complicating care. Treatment decisions frequently involve prescribing medications with severe side effects, even when safer and equally effective alternatives are available.

Surgery, the most common treatment, depends heavily on pre-surgical plans that can take 2–3 months to prepare in countries like Germany, risking tumor progression during this period.

To address these challenges, we developed LivoXpert, an advanced AI-driven system designed to revolutionize liver tumor care. Using state-of-the-art deep learning techniques, our core model—trained on 3,000 CT scans—achieves an impressive tumor detection accuracy, surpassing the capabilities of human radiologists. A secondary model complements this by analyzing tumor images at a cellular level to recommend optimal treatments with minimal side effects.

LivoXpert leverages LAMA 3.2, fine-tuned with 8 billion parameters, to generate precise pre-surgical plans in under one minute. These plans can be consulted, refined, and discussed by doctors using an integrated voice assistant. The platform also features a Patient Care Section in its web-based GUI, offering personalized medicine instructions, tailored nutrition plans, and an AI-powered chatbot for real-time support.

By streamlining workflows, reducing misdiagnoses, and enhancing care delivery, LivoXpert aims to save over 2.5 million hours for radiologists annually while alleviating the burden on healthcare systems. Moreover, it has the potential to reduce global healthcare costs by over \$500 Million each year, providing a transformative solution for liver tumor diagnosis and treatment.