

User-Centric Breast Imaging

**Client**

Malcova

Practice Areas

Advanced Imaging

Core Disciplines

Mechanical Engineering

Photonics & Imaging

Applied Physics

Challenge

Malcova's early prototype demonstrated strong potential for improved breast imaging, but required comprehensive redesign to support full functionality, human testing, and regulatory submission. Unlike conventional CT systems, the platform required independent movement of the x-ray source and detector – introducing complex synchronization challenges that directly impacted image quality and system reliability, and demanding deep expertise across robotics, imaging physics, and simulation-driven engineering.

Solution

Triple Ring applied expertise in robotics, x-ray imaging, and simulation-driven design to redesign the imaging platform and resolve its core synchronization challenges. Gantry-free motion architectures were developed to enable independent source and detector movement, while advanced simulation tools guided image reconstruction optimization and system performance. Robotics technologies supported precise motion control throughout, with flexible R&D resources deployed iteratively to explore the full design space of the imaging system.

Client Impact

- Delivered a redesigned CT imaging platform capable of flexible motion and advanced 3D imaging workflows
- Resolved complex source-detector synchronization challenges that had limited prototype performance
- Enabled comprehensive exploration of the technology's design space while maintaining reliable imaging performance
- Positioned Malcova to advance toward clinical validation and regulatory development with a fully functional, patient-centered breast imaging platform

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