TripleRing

MRI-Compatible Robotics

AiM MEDICAL ROBOTICS

Client
AiM Medical Robotics

Practice Areas
Smart Medical Devices
TechBio & Life Sciences

Core Disciplines
Mechanical Engineering
Quality System Management

Challenge

AiM Medical Robotics needed a robotic system capable of operating inside an MRI environment — where strong magnetic fields prohibit ferromagnetic materials and strict spatial constraints rule out conventional robotic architectures. The system needed to deliver reliable motion and precise positioning for neurosurgical procedures, all within one of medicine's most demanding physical environments.

Solution

Triple Ring applied first-principles engineering and multidisciplinary design expertise to develop an MRI-compatible robotic system from the ground up. MRI physics principles guided system architecture, driving the development of compatible components, assemblies, and multi-axis motion systems optimized for constrained spatial and material conditions. Rapid prototyping and iterative testing validated system performance throughout development.

Client Impact

- Delivered a four-axis robotic prototype establishing the technical foundation for MRI-compatible neurosurgery
- Demonstrated the feasibility of robotic-assisted procedures inside a live MRI environment
- Enabled AiM Medical Robotics to advance development of its image-guided surgical platform
- Established a replicable design framework for MRI-compatible robotic systems

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