LSI Alumni Innovator Spotlight: AiM Medical Robotics' Gregory Fischer

Gregory Fischer (Source: LSI USA '25)

AiM Medical Robotics is bringing real-time MRI guidance and robotic precision together to solve one of neurosurgery's most persistent challenges: hitting delicate brain targets accurately despite tissue motion. Led by Co-Founder and CEO Gregory Fischer, the company is preparing for first-in-human trials that could reshape how stereotactic neurosurgery is performed.

A Career Built Around *Precision*

Gregory Fischer's path to leading **AiM Medical Robotics** spans more than two decades at the forefront of surgical robotics, imaging, and automation. Long before founding the company, Fischer was focused on a deceptively simple problem that continues to limit outcomes across many procedures: surgeons often operate without real-time image guidance.

"While it sounds obvious, image guidance during surgery is often unavailable in many procedures today," Fischer said. "Procedures are typically performed using stale images acquired days, hours, or minutes earlier. But tissues move, targets shift, and what you planned for is not always what you find once you begin."

Fischer's fascination with robotics and medicine began early. He founded the FIRST robotics team at his high school, served as an EMT, and was influenced by his father's career as a

medical device engineer at **Ethicon**. His senior design project at **Rensselaer Polytechnic Institute** focused on a vibration-sensing surgical drill for guiding spinal applications, an experience that solidified his interest in precision interventions.

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That interest deepened during his graduate work at the NSF-funded Computer-Integrated Surgery research center at **Johns Hopkins University**, a common ancestor for many of today's surgical robotics platforms. His projects included magnetic field distortion correction for electromagnetic tracking in the operating room, enhancements to the *Steady-Hand Robot* (which evolved into the *Galen* platform), robotic ultrasound imaging, AR-guided surgical instrument alignment, and early MRI-compatible robotic systems. His PhD dissertation, *Enabling Technologies for MRI-Guided Interventions*, resulted in one of the most cited publications in the field.

In 2008, Fischer joined **Worcester Polytechnic Institute** (WPI) as a Professor of Robotics Engineering, where he launched the **Automated Interventional Medicine (AIM) Laboratory** and continued advancing MRI-compatible robotic systems through a number of NIH-funded initiatives that he led. Early clinical work in prostate interventions revealed just how dramatically soft tissue targets can move during procedures, reinforcing his belief that real-time imaging (especially MRI, the same modality typically used for planning) must be part of the intervention itself.

Why Stereotactic Neurosurgery *Needs a Reset*

That philosophy became even more urgent when Fischer partnered with neurosurgeon Dr. **Julie Pilitsis**, now president of the **American Society for Stereotactic and Functional Neurosurgery** (ASSFN). Together, they identified stereotactic neurosurgery as an area where submillimeter accuracy relative to deep brain anatomical targets is essential but rarely confirmed during the procedure.

"In neurosurgery, submillimeter accuracy is often necessary to maximize benefits and minimize side effects," Fischer explained. "But that is *not* submillimeter with respect to the skull; it is relative to soft tissue targets deep inside the brain."

Procedures like deep brain stimulation (DBS), brain tumor biopsies and ablations, and intracranial injections are all affected by brain shift, which can result from patient positioning, cerebrospinal fluid leakage, air infiltration, and swelling after interventions begin. Yet most systems rely on preoperative imaging alone for mapping internal anatomy, leaving surgeons unable to confirm accuracy during the intervention.

The consequences are significant. "One third of patients who undergo DBS procedures require reoperation, largely due to inaccuracies. Because of that, and a host of other challenges, only about 15% of patients eligible for DBS actually go forward with these procedures," Fischer emphasized.

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Inside AiM's MRI-Compatible Robotic Platform

AiM Medical Robotics was formed after Fischer and Pilitsis connected with investment banker **Craig Pierson**, who shared their interest in piezoelectric actuation and helped bring the company together. The team exclusively licensed Fischer's MRI-compatible robotic technology from his academic lab, and in 2023, Fischer stepped away from his faculty role to become CEO full time.

"We felt that in order to succeed, it was critical to have someone who lives and breathes this technology push it forward," Fischer said. "I see this as the culmination of the last 20 years of my work, finally on the brink of making an incredible difference in so many people's lives."

AiM's system is a compact, fully MRI-compatible robotic stereotactic frame

AiM's fully MRI-compatible robotic stereotactic frame (Source: AiM Medical Robotics)

(Source: LSI USA '24)

that acts as an accessory to existing MRI scanners. It requires no permanent installation or room customization and can be transported in two suitcase-sized cases and set up in minutes. The robot is constructed primarily from high-strength plastics and powered by a proprietary piezoelectric actuation system designed to operate safely inside the MRI environment without degrading image quality. AiM's robotic frame can work in just about any MRI, interventional or diagnostic, and being radiolucent, also readily supports OR-based use under intraoperative CT guidance.

> *"By pairing robotics with intraoperative MRI, we aim to* reduce procedure time, improve accuracy, and provide confirmation before the patient ever leaves the surgical field."

Crucially, the platform allows surgeons to visualize the instrument advancing toward the target in real time, compensating for brain motion as it occurs. "By pairing robotics with intraoperative MRI, we aim to reduce procedure time, improve accuracy, and provide confirmation before the patient ever leaves the surgical field," Fischer said.

"Our focus is simple: if we can perform these procedures inside the MRI, the same modality used for surgical planning, we can interactively update the surgical plan as we watch the instrument move to the target in real time and confirm accuracy during the procedure," Fischer said.

From DBS to a *Broader Delivery Platform*

AiM's beachhead indication is delivery of DBS leads for Parkinson's disease, but Fischer sees the platform as a broader stereotactic delivery system. "The same device, buyer, and anticipated regulatory approval support a range of indications. After we establish the platform in the DBS market, we plan to expand into oncology applications, including brain tumor ablation and biopsies, as well as intracranial delivery of biologics, such as gene and cell therapies," Fischer shared.

"These therapies often require eight to ten trajectories per patient as part of an all-day procedure," Fischer noted. "Precision and dose distribution become absolutely critical, and efficiency is required to become mainstream."

Across cranial neurosurgery applications, AiM estimates it is addressing a $10.1 billion U.S. market. Beyond that, AiM's unique platform can be adapted for other anatomical locations.

Progress, Capital, and *What Comes Next*

In September 2025, AiM Medical Robotics successfully closed an $8.1 million Series A financing. The funds will support a first-in-human clinical study focused on bilateral DBS lead implantation in Parkinson's disease patients using its robot, coupled with intraoperative MRI. The study is expected to demonstrate feasibility, accuracy, and meaningful time savings.

In parallel, the company has built out its management team, put together an all-star medical advisory board, expanded the engineering resources, and is advancing its commercial system under appropriate design controls. A Series B round planned for this year, anticipated at approximately $35 million, is expected to bring AiM through product development completion, regulatory clearance, and commercial launch.

AiM is headquartered in Worcester, Massachusetts, and remains closely connected to WPI and is a member of **PracticePoint**, the state-funded medtech accelerator Fischer previously founded. Having an operating room, 3T MRI, and manufacturing capabilities just steps from the office has enabled rapid, capital-efficient development.

As AiM prepares to enter first-in-human clinical studies, Fischer sees 2026 as a pivotal moment for the company, and continued engagement with the LSI community remains a key part of that trajectory.

"We have been incredibly impressed with the LSI community. We have had great success in identifying corporate partners, investors, and supporting services at past events, and through people that we have met at these events," Fischer said.

Fischer will return to the stage at LSI USA '26 to share updates on AiM's clinical progress, technology roadmap, and path toward commercialization, while connecting with investors aligned with the company's anticipated Series B and strategic partners interested in system integration and future collaboration. *LSI*