Data & Health Analytics

FUSION: Surgical Risk Prediction

Principal Investigator
May Wang, PhD

PROJECT OVERVIEW

FUSION (Forecasting Unexpected Signal Changes in Posterior Spinal Fusion), focuses on improving risk prediction during spinal fusion surgery using advanced machine learning techniques. By analyzing multimodal clinical data including: patient demographics, diagnoses, and surgical plans. The research aims to identify patients at risk of intraoperative neurological complications. This project integrates natural language processing, predictive modeling, and causal inference to support more informed surgical planning and better patient outcomes.

The Challenge

Spinal fusion procedures carry a risk of unexpected neurological complications that are difficult to predict using traditional methods. Existing approaches often rely on limited data and lack real-time, data-driven insights for surgical planning.

The Innovation

FUSION integrates natural language processing, predictive modeling, and causal inference to analyze complex clinical datasets. This approach enables more accurate risk prediction by uncovering patterns across both structured and unstructured medical data.

Potential Impact

By improving early risk detection, FUSION can enhance surgical planning, reduce complications, and lead to safer outcomes for pediatric patients undergoing spinal fusion.

INSTITUTION	FUNDING	STATUS	TIMELINE
Georgia Institute of Technology	$582,958	Active	2025 -