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AI-Powered MRI Platform: Advancing High-Throughput Diagnostics and Biomarker Extraction for Joint Health

Tech ID: 34578 / UC Case 2022-240-0

TECHNOLOGY DESCRIPTION

UCSF researchers have developed an advanced digital health methodology for high-throughput image processing and feature extraction from musculoskeletal Magnetic Resonance Imaging (MRI) using Artificial Intelligence (AI). This innovative platform simultaneously reconstructs high-quality images while robustly analyzing biomarkers and features of joint tissue, such as cartilage thickness, meniscus and ligament composition (T1rho/T2), intervertebral disc height, bone shape, and muscle fat quantification. By reducing acquisition time and maintaining the integrity of the original image, the technology enables fast, quantitative imaging that eliminates multiple steps of data manipulation, making the process faster, more precise, and scalable. Currently in early development, this cost-effective solution improves diagnostic precision, accelerates therapeutic monitoring, and offers transformative applications in classification, progression tracking, and joint health management. The platform provides a unique opportunity for software companies, MR scanner vendors, and system integrators to advance precision imaging solutions.

RELATED MATERIALS

▶ Region of interest-specific loss functions improve T2 quantification with ultrafast T2 mapping MRI sequences in knee, hip and lumbar spine. PMID: 36564430 PMCID: PMC9789075 DOI: 10.1038/s41598-022-26266-z - 12/23/2022

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KEYWORDS

AI-powered MRI diagnostics, High-throughput imaging analysis, Musculoskeletal MRI innovation, Machine learning for MRI, Joint health biomarker extraction, Fast quantitative MRI reconstruction, Precision imaging solutions, Degenerative joint disease imaging

CATEGORIZED AS

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