

Real-Time Biomechanics Using AI and Respiratory Training to Boost Swimming Performance

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Abstract: *This paper explores the integration of newer technologies like artificial intelligence (AI) in respiratory muscle training (RMT) and real-time biomechanical analysis to enhance swimming performance and respiratory efficiency. Combining AI-driven personalized training protocols with biomechanical feedback aims to improve inspiratory muscle strength, optimize breathing patterns, and refine stroke mechanics. This interdisciplinary approach leverages machine learning, motion capture, and physiological monitoring in aquatic sports. Results from experimental trials with swimmers demonstrate significant improvements in respiratory performance and swimming efficiency. The findings highlight AI's potential to revolutionize training strategies, offering data-driven customization to boost athletic outcomes.*

Keywords: Artificial Intelligence (AI), Respiratory Muscle Training (RMT), Biomechanical Analysis, Swimming Performance

