DIGEST

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A striking image of runner, showcasing wearable technologies

How AI and Wearable Technology Are Reshaping Distance Running

In distance running, AI-powered wearables have fundamentally changed how athletes train, recover, and manage injury risk. GPS watches and sensors continuously track running-specific metrics such as pace, cadence, stride length, ground contact time, heart rate, elevation gain, and training volume. Artificial intelligence analyzes these variables longitudinally, learning each runner's physiological baseline and response to stress. By recognizing patterns associated with fatigue, inefficiency, or biomechanical imbalance, AI systems can flag elevated injury risk before pain or breakdown occurs. This allows runners and sports medicine professionals to intervene early through adjustments in mileage, intensity, or recovery protocols rather than reacting after an injury has already developed, they result in performance decline or injury.

AI also plays a central role in performance forecasting and race preparation for runners. By analyzing training runs over weeks or months, AI models can estimate aerobic capacity, endurance durability, and pacing sustainability, enabling accurate predictions of race outcomes such as marathon finishing times. These projections adapt dynamically as training evolves, reflecting improvements in fitness or signs of overtraining. From a clinical and coaching perspective, this data-driven approach supports smarter training decisions, more precise tapering strategies, and safer return-to-run timelines after injury. In running, AI-powered wearables bridge the gap between performance optimization and long-term musculoskeletal health, making them an increasingly essential tool in modern sports medicine. growing importance in sports medicine.