Game Analytics for Metrics and Insights in Change Service (GAMIC): Leveraging Big Data and AI for Athlete Performance Optimization

Alessandro Quarto
myHermes Srl, Taranto, Italy

Andrea Cantoro
Agon Srl, Treviso, Italy

Domenico Soldo
Agon Srl, Treviso, Italy

Simona Gemmano
myHermes Srl, Taranto, Italy

Abstract:

This paper describes the activities of the GAMIC Project. The project focuses on the application of electronic monitoring technologies and leverages the era of big data which has significantly impacted the sport industry. GAMIC operates within the domains of Cloud, Fog, and Quantum Computing, as well as Big Data and Data Analysis. The project's objective is to improve athletic performance and reduce injury risk by analyzing vast amounts of data generated from athletes. This is achieved through the integration of cloud computing with wearable technology for data collection, storage, and processing, the definition of a structured data management system, the application of methodologies for performance evaluation based on training load analysis, and the prototyping of Machine Learning algorithms for performance prediction and training optimization. The paper outlines the system setup, data models, the use of sensor data, developed analytical models including the Acute: Chronic Workload Ratio (ACWR), and the implementation of a neural network-based optimization system designed to suggest training configurations for maximizing game performance. The project involves problem analysis, design solution modeling, definition of data and architectural infrastructure, and progresses towards hardware and software prototype implementation.

Keywords:

Basketball, big data, sport, wearable sensor, ACWR.