

Analysis and visualization for soccer game^{*}

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Abstract

We used in the Avatar project data, provided by the U1 research, to examine members of a soccer team. The data contains the coordinates in 2D of the ball as well as the home and guest coordinates. The number of sampling points taken per second was 25. Building on these data we calculated the physical and technical performance of all players and for both half times. Physical data: total distance covered, high-intensity running distance, very high-intensity running distance, total distance covered with the ball, high-intensity running distance with the ball, very high-intensity running distance with the ball, specific kinetic energy. Technical data: ball possession, short passes, successful short passes, long passes, successful long passes. Beside the analysis, the real time visualization of the data is also necessary. We developed a player that makes possible to playback the data including spatial and temporal navigation as well. Given situations can be replayed from any point of the field including the viewpoint of the players. This makes possible the human intelligent annotation of raw data. We used Java language and jMonkeyEngine framework during the development. This latter tool is a free, open source framework used primarily as a game engine, however because its effectiveness it is also often used as a visualization tool in scientific projects.

Keywords: soccer, statistics, visualization

MSC: 62-07

References

- [1] Yue, Z., Broich, H., Seifriz, F., & Mester, J, Mathematical analysis of a soccer game. Part I: Individual and collective behaviours, *Studies in Applied Mathematics*, 121 (3) (2008), 223-243.
- [2] Yue, Z., Broich, H., Seifriz, F., & Mester, J, Mathematical analysis of a soccer game. Part II: Energy, spectral and correlation analysis, *Studies in Applied Mathematics*, 121 (3) (2008), 245-261.
- [3] Yue, Z., Broich, H., Seifriz, F., & Mester, J, Kinetic energy analysis for soccer players and soccer matches, *Progress in Applied Mathematics*, Vol. 1, No.1 (2011), 98-105.

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