

SimSpark: An Open Source Robot Simulator Developed by the RoboCup Community

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Abstract. SimSpark is an open source robot simulator developed by RoboCup Community. This paper briefly describes the development of SimSpark since 2008. Furthermore, some new features are proposed and implemented for the next RoboCup, including realistic motor, heterogeneous robots, and agent proxies. As a powerful tool to state different multi-robot researches, SimSpark has been successfully used in RoboCup simulation league, standard platform league and humanoid league.

1 Introduction

The development on robots may be severely limited by the constrained resources. This is especially true in the research of multi-robot systems in areas such as RoboCup. Using simulation for algorithm development and testing makes thing easier.

SimSpark, a multi-robot simulator based on the generic components of the Spark[7] physical multi-agent simulation system, has been used in the RoboCup Soccer Simulation League since 2004. The project was registered as open source project in SourceForge in 2004, it has an established code base with development increasing year-over-year. As the result, RoboCup soccer simulations have changed significantly over the years, going from rather abstract agent representations to more and more realistic humanoid robot games[2,3]. Thanks to the flexibility of the Spark system, these transitions were achieved with little changes to the simulator's core architecture.

In this paper we describe the recent development of SimSpark project, which make the SimSpark possible to simulate 11 vs. 11 humanoid robot soccer games in real time. In section 2, we will give an overview of the SimSpark project since 2008. After that, we will describe the development of the Spark simulation platform in section 3 and the implementation of RoboCup 3D Soccer Simulator in section 4. We will introduce some new features for RoboCup 2013 in section 5. Furthermore, we will give the application examples of SimSpark in section 6. Finally, we will outline future development plans in section 7.