

RoboCup Logistics League Sponsored by Festo: A Competitive Factory Automation Testbed

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Abstract. A new trend in automation is to deploy so-called cyber-physical systems (CPS) which combine computation with physical processes. The novel RoboCup Logistics League Sponsored by Festo (LLSF) aims at a such CPS logistic scenarios in an automation setting. A team of robots has to produce products from a number of semi-finished products which they have to machine during the game. Different production plans are possible and the robots need to recycle scrap byproducts. This way, the LLSF is a very interesting league offering a number of challenging research questions for planning, coordination, or communication in an application-driven scenario. In this paper, we outline the objectives of the LLSF and present steps for developing the league further towards a benchmark for logistics scenarios for CPS. As a major milestone we present the new automated referee system which helps in governing the game play as well as keeping track of the scored points in a very complex factory scenario.

1 Introduction

A new trend in automation is to deploy so-called cyber-physical systems (CPS) to larger extents. These systems combine computation with physical processes. They include embedded computers and networks which monitor and control the physical processes and have a wide range of applications in assisted living, advanced automotive systems, energy conservation, environmental and critical infrastructure control, or manufacturing [1]. One application area of CPS are logistics scenarios in automation settings. As production is going to move away from mass production towards customized products, the challenges for the automation process will increase. This will open the floor to mobile robots in order to help with the manufacturing process.

In particular, mobile robots will be deployed for transportation tasks, where they have to get semi-finished products in place to be machined in time. This is right where the novel *RoboCup Logistics League Sponsored by Festo* (LLSF)