Multi-Agent System for Irrigation Using Fuzzy Logic Algorithm and Open Platform Communication Data Access

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Abstract : Automatic irrigation systems usually conveniently protect landscape investment. While conventional irrigation systems are known to be inefficient, automated ones have the potential to optimize water usage. In fact, there is a new generation of irrigation systems that are smart in the sense that they monitor the weather, soil conditions, evaporation and plant water use, and automatically adjust the irrigation schedule. In this paper, we present an agent based smart irrigation system. The agents are built using a mix of commercial off the shelf software, including MATLAB, Microsoft Excel and KEPServer Ex5 OPC server, and custom written code. The Irrigation Scheduler Agent uses fuzzy logic to integrate the information that affect the irrigation schedule. In addition, the Multi-Agent system uses Open Platform Connectivity (OPC) technology to share data. OPC technology enables the Irrigation Scheduler Agent to communicate over the Internet, making the system scalable to a municipal or regional agent based water monitoring, management, and optimization system. Finally, this paper presents simulation and pilot installation test result that show the operational effectiveness of our system.