Task inference and distributed task in the Centibots robotic system

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We describe the Centibots system, a very large scale distributed robotic system, consisting of more than 100 robots, that has been successfully deployed in large, unknown indoor environments, over extended periods of time (ie, durations corresponding to several power cycles). Unlike most multiagent systems, the set of tasks about which teams must collaborate is not given a priori. We first describe a task inference algorithm that identifies potential team commitments that collectively balance constraints such as reachability, sensor coverage, and communication access. We then describe a dispatch algorithm for task distribution and management that assigns resources depending on either task density or replacement requirements stemming from failures or power shortages. The targeted deployment environments are expected to lack a supporting communication infrastructure; robots manage their own network and reason about the concomitant localization constraints necessary to maintain team communication. Finally, we present quantitative results in terms of a" search and rescue problem" and discuss the team-oriented aspects of the .system in the context of prevailing theories of multiagent collaboration

Enabling end-user driven business process composition through programming by example in a collaborative task management system

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Letting end users tailor business processes can result in business process management support, which is better turned to userspsila needs and organizational changes. However, such tailoring requires not only the userspsila domain expertise but also advanced skills in computer use, which business users mostly lack. The paper presents the design of the collaborative task manager (CTM) prototype which overcomes this limitation and enables end users to become informed participants in business process composition. CTM uses enterprise-wide ldquoprogramming by examplerdquo by exposing common functionalities for personal task management to the end users and tracking their

activities to generate end-to-end process execution examples on a central instance. These can be adapted and reused for ad-hoc process support or exported to formal process models, which enables tailoring as collaboration between business users, end-user tailors and developers. The paper finally reports on trial usage of the tool at a partner company