Evaluation of agent oriented methodologies for the development of flexible embedded real-time systems in automation

Abstract:
Embedded real-time systems play an important role in various application areas like plant automation, product automation or car electronics. In recent years a considerable growth in the functionality was observed. At the same time expectations on systems flexibility at runtime are growing steadily. The paradigm of agent oriented software engineering tackles the demand for adaptable software systems and is a well suited approach for the development of decentralized, complex software systems with high flexibility. A number of software engineering methodologies have been introduced for developing agent oriented systems. However, none of the existing methodologies is intended for the development of embedded real-time systems. This article evaluates four relevant agent oriented methodologies regarding their suitability for the development of flexible embedded real-time systems in automation. For this purpose evaluation criteria are defined and categorized. The domain-specific weaknesses are pointed out and illustrated with an application example.