Designing and formalizing software architectures for distributed systems using new network technologies.

Designing and implementing middleware infrastructures for interoperable pervasive systems.

Following the Inria's age limit for research teams, ARLES closed on 12/31/2013 after 12 years of existence. ARLES is to be followed up by the MiMove team researching on Middleware Solutions for Mobile Systems. Y ou can find m ore Information about MiMove team through: mimove.inria.fr

Scientific areas

With digital equipment becoming increasingly networked, either on wired or wireless networks, for personal and professional use alike, distributed software systems have become a crucial element in information and communications technologies. The study of these systems forms the core of the ARLES' work, which is specifically concerned with defining new system software architectures, based on the use of emerging networking technologies. In this context, we concentrate on the study of distributed systems which bring to life the vision of ubiquitous computing systems, also known as ambient intelligence.

Our research focuses more specifically on two interrelated areas:

- Defining languages, methods and tools for developing distributed software systems, through dynamic composition of digital resources deployed within a network. This involves defining abstractions to enable discovery, access, composition and interoperability while ensuring quality aspects, such as availability, reliability and security, together with adaptation to context and respect for privacy.
- Defining new middleware infrastructures for implementing ubiquitous computing in hybrid networks beyond the third generation, in particular combining sensors, ad hoc wireless networks and infrastructure-based ones. Thus, it is essential to study solutions for managing heterogeneous distributed systems, which integrate the limited capabilities of some of these resources, as well as possible connectivity between different radio links.

Our work therefore focuses on the study of algorithms and distributed protocols for sharing and coordinating digital resources in multi-radio, multi-network and multi-protocol environments.

Keywords

Software architecture, service-oriented architecture, system composition, software engineering, mobile computing, ambient intelligence, middleware, hybrid wireless networks, Web services, dependability, distributed systems, sensor networks, interoperability.

Visit the ARLES Web site to know more...