Spatial Views: Space-Aware Programming for Networks of Embedded Systems

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Abstract

Networks of embedded systems, in the form of cell phones, PDAs, wearable computers, and sensors connected through wireless networking technology, are emerging as an important computing platform. The ubiquitous nature of such a platform promises exciting applications. This paper presents a new programming model for a network of embedded systems, called Spatial Views, targeting its dynamic, space-sensitive and resource-restrained characteristics. The core of the proposed model is iterative programming over a dynamic collection of nodes identified by the physical spaces they are in and the services they provide. Hidden in the iteration is execution migration as the main collaboration paradigm, constrained by user specified limits on resource usage such as response time and energy consumption. A Spatial Views prototype has been implemented, and first results are reported.