Título: **System support for self-adaptive cyber-physical systems**

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Resumo:

Devices with computational and communication capabilities are pervaded throughout the physical environment, generating information about their users and interactions to augment the virtual world. This proximity between physical and cyber worlds is permitting the appearance of Cyber-Physical Systems (CPS), formed by users and devices (physical) interacting with services, components and applications (cyber). When the number of physical and cyber entities increase, so does the need for formalisms to specify and manage their interactions. In that direction, this doctoral thesis presents an adaptable software stack to offer system support for self-adaptive CPS. The contribution is based on layers: on the bottom, the communication and coordination layer is responsible for a modular, uncoupled and adaptable infrastructure to permit access and control of environment resources, along with message exchange and interaction of decentralized devices. On the top layer, the execution and adaptation layer permits develops to specify and implement monitoring and execution functionalities to support the creation of self-adaptive CPS. The entire contribution is validated according to performance and design metrics, as well as with the development of proofs of concept.

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