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Thesis Proposals 2018

Embedded systems in dense data networked systems.

Embedded Systems, data analytics, hybrid systems, distributed computing, real-time, reconfigurable, IoT

The Internet of Things (IoT) is a paradigm that combines a plethora of smart distributed sensors associated with complex analytics stationed in data centers. These plethora and analytics are used solve problems that can range from intelligent transportation systems to personalized medicine. However, existing computational infrastructures that exist today are built upon old assumptions about how to combine computation and communication, and, as a result, do suffer from fundamental inefficiencies in terms of computational speeds, energy efficiency, data throughput…. We are interested in re-organizing, re-modeling and re-establishing of new computational methods and architectures in order to target solutions for the mentioned difficulties and challenges in which embedded systems can be of great aid.

The topic of this PhD project is concerned with proposing techniques, methods, models, implementations and infrastructures for incorporating efficient hardware accelerator technology on hybrid embedded systems (FPGA, ASIC and CPU) within connected distributed computing systems. The work also includes the virtualization of data interfaces mapped on hardware as accelerators and integrating these within software infrastructure, and building applications and interfaces to demonstrate the advantages of our proposed approach. The focus will be on big data analytics, however, different domains can benefit from this solution such as in centralized data centers or distributed embedded applications.

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