ACTORS Adaptive Resource Management Demo

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Demo Abstract: ACTORS Adaptive Resource Management Demo

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1 Abstract

In this demo the adaptive resource management framework for multi-core platforms, developed in the ACTORS project [2] will be demonstrated. The framework is presented in detail in [3, 1]. The demonstration consists of two parts. In the first part a live demonstration will be performed. The hardware used consists of a quad-core x86 laptop connected to an AXIS network camera generating an MPEG-4 SP stream. The main application is an MPEG-4 decoder implemented in the dataflow/actors programming language CAL. The demonstration will present

- how the adaptive management of CPU budget is performed , and
- how different resource allocation policies influence the behaviour of the system.

The second part of the demonstration consists of two videos. The first video shows how the resource management framework is used in a video quality adaptation context. A video player client is executing under the control of the resource manager. When the resources to the player are reduced it requests a video server to reduce the amount of work required to decode the video by either frame skipping (for MPEG-2 streams) or by skipping macro block coefficients (for MPEG-4 streams).

The second video shows a feedback control demo in which three physical laboratory processes are controlled by controllers implemented in CAL and executing under the control of the resource manager. The processes are one inverted pendulum that is held by an industrial ABB robot that do automatic swing-up and balancing of the pendulum. The other processes are two ball and beam processes where the aim is to control the position of a ball that is rolling on a tilting beam.

References

[1] Karl-Erik Årzén, Vanessa Romero Segovia, Stefan Schorr, and Gerhard Fohler. Adaptive resource management made real. In *In submission to APRES 2011, Chicago, April 11*, 2011.

[2] The ACTORS project webpage. http://www.actors-project.eu. URL, 2010.

[3] Vanessa Romero Segovia, Karl-Erik Årzén, Stefan Schorr, Raphael Guerra, Gerhard Fohler, Johan Eker, and Harald Gustafsson. Adaptive resource management framework for mobile terminals - the ACTORS approach. In *Proceedings of the First International Workshop on Adaptive Resource Management (WARM), Stockholm, Sweden*, 2010.