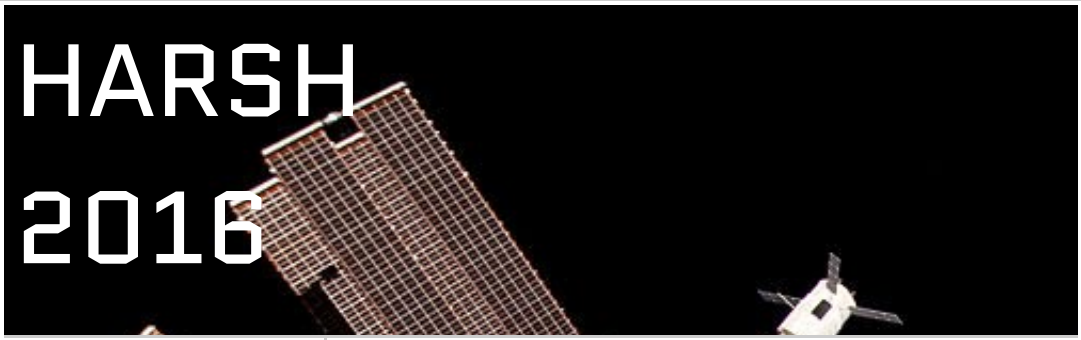


General Information

Workshop on Highly-Reliable Power-Efficient Embedded Designs

March 12th 2016, Barcelona (Spain)
In conjunction with HPCA 2016, CGO 2016, and PPoPP 2016
Submissions here
Questions info@harsh-workshop.org

HARSH 2016 will provide a unique forum for the discussion of the challenges in the design and operation of harsh environment-capable embedded processors.

Nowadays, embedded chips are deployed almost everywhere, from mobile phones to on-board electronics in automobiles and satellites. Different from conventional microprocessor designs, the operation conditions of embedded processors are severely constrained by the environment. For example, in aerospace applications, the computer installed on Mars rover "Curiosity" has to tolerate extreme space radiation and temperatures, operate at low power, and provide enough computation capability to perform mission-critical tasks. Embedded designs for Unmanned Aerial Vehicles (UAVs) also encounter extremely challenging design

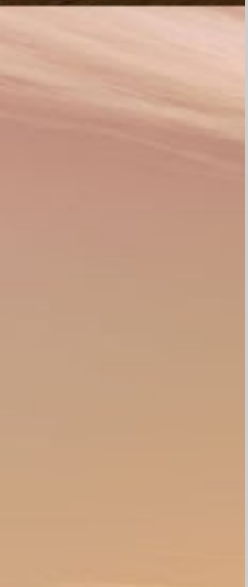
requirements. Despite their tight power budget, UAV chips demand significant throughput for real-time high-speed image processing. In the context of oil and gas exploration and extraction, embedded processors can be found even on the drill string itself, to process sensor inputs in real time while withstanding high temperatures and humidity levels.

To guarantee reliability across these drastically diverse environments, the design and operation of embedded processors should not be solely confined to the chip but traverse different layers in the computing system, involving firmware, operating system, applications, as well as power management units and communication interfaces. The goal of HARSH 2016 is to facilitate the exchange of the latest ideas, insights, and knowledge related to all critical aspects of new-generation harsh environment-capable embedded processors, including micro-architectural approaches, cross-stack hardware/software techniques, and emerging challenges and opportunities. We hope to attract a group of interdisciplinary researchers from academia, industry, and government research labs.

In addition to the presentation of selected paper submissions, keynote speakers will be invited to kick-off the workshop sessions and a “Best Paper” award will be presented at the conclusion of the workshop. To encourage discussion between participants, HARSH 2016 will organize dedicated programs for discussion between presenters and the audience.

Topics of interest include but are not limited to:

1. **Architecture design and**


implementation for highly-reliable power-efficient embedded processors:

- Architectural approaches for reliability assurance under very-low power budgets.
- Availability, soft-error tolerance and recovery issues.
- Highly-reliable cache/memory hierarchies.
- Massive heterogeneous processing capabilities.
- Power management techniques.
- Very-low power, reliable real-time processing.
- Specialized accelerator architectures and unique designs.
- Reusable and/or reconfigurable embedded designs.
- Packaging and cooling.

2. **Cross-stack hardware/software techniques:**
   - Cross-stack approaches for reliability assurance under very-low power budgets.
   - Reliability- and power-aware operating systems, compilers, workload managers, firmware and other software.
   - Workload analysis and optimization for reliable low-power embedded systems.

3. **Applications:**
   - Aerospace: unmanned aerial vehicles (UAVs), planetary rovers and space probes, satellites, avionic systems, etc.
   - Medical support: lifesaving monitors, portable medical devices, high-end imaging systems, etc.
   - Oil and gas exploration and extraction: unmanned underwater vehicles (UUVs),





measurement while drilling (MWD), logging while drilling (LWD), etc.
    - Aerial surveillance.
    - Disaster search, rescue, and relief.
    - Novel applications for highly-reliable low-power embedded chips.

Important Dates

- **Submission deadline: Jan 22, 2016**
- Notification of acceptance: Feb 8, 2016
- Final paper submission: Feb 26, 2016
- Workshop date: Mar 12, 2016

Previous Editions

- HARSH 2014
- HARSH 2013