Alternative Computing for Internet of Things
Extended – Submissions due August 15, 2016

The impending Internet of Things (IoT) wave is promising to affect every aspect of our daily lives, ranging from smart things to smart buildings to smart cities and smart environments. A lot of attention has been devoted to the tsunami of data produced by IoT, and the related means of extracting useful actionable information from it, spawning efforts in big data processing and machine learning. Yet, all of this does little to address the need for IoT to capture, interpret and act on this wall of (noisy) information at the right time, at the right place and in the right form. Conventional computing systems are a poor match to the needs of this emerging massively distributed real time system. Hence **alternative computing** techniques present an attractive alternative, trading off computational resolution for significant gains in quality-of-service energy efficiency and robustness This observation is based on the conjecture that most applications related to IoT have an inherent error resilience and are evolutionary (that is, learning based). Alternative computing strategies may be conceived at every level of the design hierarchy, starting from the device level with novel 3D non-volatile memory/logic combinations, or at the architectural level by shifting away from the traditional Von Neumann architecture to different computing paradigms such as neuromorphic and/or stochastic computation all the way up the algorithmic and data representation levels.. Authors are invited to submit high quality papers containing original work from either academia or industry reporting novel advances in (but not limited to) the following topics:

- IoT-aware nano-CMOS and beyond-CMOS devices, sensors, and circuits
- Specialized and modern memory systems for IoT (e.g., Memristor, STT-RAM, FeRAM, etc.)
- Sub-and near-threshold computing in the IoT regime
- Reconfigurable embedded sensing and actuating, enabling runtime selection of quality, operation mode and parameter settings of IoT devices
- Alternative architectures for IoT-specific Big Data search, predictive analytics, deep learning, high dimensional data, feature selection, and feature transformation
- IoT-specific approximate design, exploration and optimization
- Accelerators for IoT (e.g., learning, neuromorphic and cognitive computing)
- Brain-inspired and neuromorphic components, circuits, and systems for IoT
- Case studies for alternative computing in the IoT era

IMPORTANT DATES

MANUSCRIPT DUE: ~~JULY 15, 2016~~ EXTENDED TO AUGUST, 15, 2016
ACCEPTANCE/REJECTION NOTIFICATION: ~~SEPTEMBER 15, 2016~~ ----> OCTOBER 15, 2016
2ND ROUND CHECK: ~~NOVEMBER 15, 2016~~ -----> DECEMBER 15, 2016
FINAL MANUSCRIPT DUE: ~~DECEMBER 15, 2016~~ ----> JANUARY 15, 2017

PLEASE SEE INSTRUCTIONS BELOW FOR IMPORTANT SUBMISSION DETAILS

GUEST EDITORS

Jan Rabaey   Andrew Kahng   Farshad Firouzi   Natasha Balac   Bahar Farahani

Submissions and Questions:

All manuscripts must be submitted through the TVLSI ScholarOne site https://mc.manuscriptcentral.com/tvlsi-ieee. Once you start the submission process in your Author Center, make sure to do the following:

1. Step 1 / Type: Make sure to choose "Special Section"
2. Step 5 / Special Section: Choose "Alternative Computing for IoT" in the dropdown menu

Failure to choose both options will result in your manuscript being processed in the general pool

Submitted manuscripts will be reviewed according to the peer review policy of TVLSI as available on-line at http://tvlsi.egr.duke.edu/. Previously published conference papers should be clearly stated by the authors and an explanation should be provided how such papers have been extended to be considered for this special issue. Manuscripts should be formatted and be submitted online according to the instructions for TVLSI at http://tvlsi.egr.duke.edu/manuscript.htm. Please direct questions regarding the special issue to Farshad Firouzi (farshadfirouzi@gmail.com).