

CALL FOR PAPERS
Low-Power Image Recognition
IEEE Transactions on Emerging Topics in Computing
Special Issue/Section

IEEE Transaction on Emerging Topics in Computing (TETC) seeks original manuscripts for a Special Issue/Section on **Low-Power Image Recognition** scheduled to appear in September 2016.

Digital images have become integral parts of everyday life. It is estimated that 10 million images are uploaded to social networks each hour and 100 hours of video uploaded for sharing each minute. Sophisticated image / video processing has fundamentally changed how people interact. For example, automatic classification or tagging can mediate how photographs are disseminated to friends. Many of today's images are captured using smartphones, and cameras in smartphones can be used for a wide range of imaging applications, from high-fidelity location estimation to posture analysis. Image processing is computationally intense and can consume significant amounts of energy on mobile systems. This special issue focuses on the intersection of image recognition and energy conservation. Papers should describe energy efficient systems that perform object detection and recognition in images.

This special issue aims to establish milestones of the state of the art. Thus, all papers are required to include results on a common core of datasets using the same metrics. Training images will be sampled from the data for ILSVRC 2014 (ImageNet Large Scale Visual Recognition Challenge). These images are already annotated with objects. The objects are classified into approximately 200 categories that are typically used in everyday lives, for example, flower, car, and dog. Authors will submit results on a separate test dataset set to a centralized server in order to evaluate detection accuracy.

All submitted papers must present the ratio of mAP/E. Here mAP is the mean across object categories of the average precision for detection of that category, and E is the total energy consumption. For fairness, authors must report the energy consumed by the entire systems and the systems must not have any energy storage device (such as batteries or fuel cells). Authors may choose to use commercial hardware or design special-purpose hardware, or a combination of commercial and custom hardware. Accepted papers must report functional systems. Conceptual designs and simulations are not accepted. The submissions are divided into two groups. Authors must clearly identify which groups their papers belong to.

1. Computation offloading is not allowed. The computation must be performed on a mobile system whose energy is measured. Sending computation to any other machine is not allowed.
2. Computation offloading is allowed. Sending computation to another machine (or machines) is allowed. Only the energy consumed by the mobile system is measured.

Authors should provide details analysis of their methods in improving the accuracy of image recognition and in reducing the total energy consumption.

Submitted articles must not have been previously published or currently submitted for journal publication elsewhere. As an author, you are responsible for understanding and adhering to the submission guidelines. You can access them at the IEEE Computer Society web site, www.computer.org. Please thoroughly read these before submitting your manuscript. TETC is the newest Transactions of the IEEE Computer Society with Open Access only.

Please submit your paper to Manuscript Central at <https://mc.manuscriptcentral.com/tetc-cs>

Tentative Schedule:

- Training data available on www.lpirc.net: December 1, 2014

- Testing data available on www.lpirc.net: March 1, 2015
- Submission Deadline: September 1 2015
- Reviews Completed: December 1 2015
- Major Revisions Due: January 1 2016
- Reviews of Revisions Completed: February 1 2016
- Minor Revisions Due: March 1 2016
- Notification of Final Acceptance: May 1 2016
- Publication Materials for Final Manuscripts Due: June 1 2016
- Publication date: Third Issue 2016 (September Issue)

Please address all other correspondence regarding this special Section to Lead Guest Editor Yung-Hsiang Lu, yunглу@purdue.edu

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