

# NeuroCube: Low-Power Reconfigurable Neuromorphic Architecture Using Hybrid Memory Cube

## Abstract

*This document serves as a sample for submissions to MICRO 2014. We provide some guidelines that authors should follow when submitting papers to the conference.*

## 1. Introduction

THIS PART IS FOR INTRODUCTION

1. Machine Learning is important application in RMS (Recognition/Mining/Synthesis)
2. However, it's impossible to operate current ML techniques in embedded system due to massive computation
3. As demands for ML in embedded system such as IoT/Mobile platform increases, low-power and high power-efficiency ML is required
4. Therefore, Specific Architecture for ML is required which is better than General Purpose Micro-Arch such as CUDA
5. Deep Learning Network: compsed of multiple different type of NN is powerful tool in ML
6. To operated diff. NNs with single ASIC, Reconfigurability is important in Neuromorphic Architecture

## 2. Previous Work

### 2.1. Neuromorphic hardware implementation

For MICRO-47, we are instituting a new paper submission format and reference requirements. All submissions are allowed a maximum of 11 pages of single-spaced two-column text content according to the formatting guidelines below. In addition, submissions are allowed a references section of unlimited length outside of this 11-page limit.

References must include complete author lists to facilitate the reviewing process.

### 2.2. Neural network for machine learning

If you are using L<sup>A</sup>T<sub>E</sub>X to typeset your paper, then we suggest that you use the template available here: [L<sup>A</sup>T<sub>E</sub>X Template](#). (This document was prepared with that template.) If you are using a different software package to typeset your paper, then please adhere to the guidelines mentioned in Table 1.

**Please ensure that you include page numbers with your submission.** This makes it easier for the reviewers to refer to different parts of your paper when they provide comments.

### 2.3. Content

**Author List.** All submissions are double blind. Therefore, please do not include any author names in the submission.

Field	Value
Page limit	11 pages + references
Paper size	US Letter 8.5in × 11in
Top margin	1in
Bottom margin	1in
Left margin	0.75in
Right margin	0.75in
Space between columns	0.25in
Body font	10pt
Abstract font	10pt, italicized
Section heading font	12pt, bold
Subsection heading font	10pt, bold
Caption font	9pt, bold
References	8pt, no page limit, list all authors

**Table 1: Formatting guidelines for submission.**

You must also ensure that the metadata included in the PDF does not give away the authors. If you are improving upon your prior work, refer to your prior work as a third person and include references to your past work.

**Figures and Tables.** Ensure that the figures and tables are legible. Please also ensure that you refer to your figures in the main text. Many reviewers print the papers in gray-scale. Therefore, if you use colors for your figures, ensure that the different colors are distinguishable in gray-scale.

**Main Body.** Avoid bad page or column breaks in your main text, i.e., last line of a paragraph at the top of a column or first line of a paragraph at the end of a column. If you begin a new section or sub-section near the end of a column, ensure that you have at least 2 lines of body text on the same column. Note that the entire main body of your submission as well as any Figures, footnotes, etc., must conform to the 11-page content limit; only references may appear on additional pages.

**References.** There is no length limit for references. Each reference must explicitly list all authors of the paper. Papers not meeting this requirement will be rejected. Authors of NSF proposals should be familiar with this requirement. Knowing all authors of related work will help find the best reviewers.

## 3. Submission Instructions

### 3.1. Paper Authors

Declare all the authors of the paper upfront. Addition/removal of authors once the paper is accepted will have to be approved by the program chair.

### 3.2. Conflict Responsibilities

Authors must register all their conflicts on the paper submission site. Conflicts are needed to ensure appropriate assignment of reviewers. If a paper is found to have an undeclared conflict that causes a problem OR if a paper is found to declare false conflicts in order to abuse or "game" the review system, the paper may be rejected.

Please declare a conflict of interest (COI) with the following for any author of your paper:

1. Your Ph.D. advisor, post-doctoral advisor, and Ph.D. students
2. Other past or current advisors
3. Current or past students
4. Family relations by blood or marriage (if they might be potential reviewers)
5. People with the same affiliation
6. People whom you co-authored accepted/rejected/pending papers with in the last 5 years
7. People whom you co-authored accepted/pending grant proposals with in the last 5 years

"Service" collaborations like co-authoring a CSTB report or co-presenting tutorials do not constitute conflicts. However, there may be others not covered by the above with whom you know a COI exists. Please report such COIs; however, you will need to justify them. Please be reasonable. For example, just because a reviewer works on similar topics as your paper, you cannot declare a COI with that reviewer. We will carefully check the justification of conflicts and take action when authors seem to be blacklisting reviewers without sufficient justification.

We hope to draw most reviewers from the PC and the ERC, but others from the community may also write reviews. Please declare all your conflicts (not just restricted to the PC and ERC). When in doubt, contact the program chair.

### 3.3. Concurrent Submissions and Resubmissions of Already Published Papers

By submitting a manuscript to MICRO-47, the authors guarantee that the manuscript has not been previously published or accepted for publication in a substantially similar form in any conference or journal. The authors also guarantee that no paper which contains significant overlap with the contributions of the submitted paper is under review to any other conference or journal or workshop, or will be submitted to one of them during the MICRO-47 review period. Violation of any of these conditions will lead to rejection.

Extended versions of papers accepted to IEEE Computer Architecture Letters can be submitted to MICRO-47. As always, if you are in doubt, it is best to contact the program chair.

## 4. Submission Site

A link to the submission site will be posted on the MICRO-47 web site <http://www.microarch.org/micro47/> in mid April.

## References

- [1] K. Flautner *et al.*, "MICRO'47 Conference Site," 2014. Available: <http://www.microarch.org/micro47/>