Re: COL719 Course Projects

From Ayushi Agarwal <ayushi.agarwal@sit.iitd.ac.in>
To Preeti Ranjan Panda <panda@cse.iitd.ac.in>, <2402-col719@courses.iitd.ac.in>
Cc Ayushi Agarwal <anz188503@sit.iitd.ac.in>, Divya Praneetha <divyapraneetha@gmail.com>
Date 07.02.2025 13:17

Hi Students,

This email only concerns the students who have been allotted the following two projects:
1. Accelerators: DVFS
2. Accelerators: 3D Stacking

You can start-off with the following:

Resources:
1. Scale-Sim-v2: https://scalesim-project.github.io – this is the project page with links to the source code (on GitHub), documentation, and tutorials.
Scale-Sim-v2 Setup: Instructions are here: https://github.com/scalesim-project/scale-sim-v2
- We will be using the *scalesim-accelergy* branch in both projects. Please follow the steps in *rundir-accelergy* folder.
It will help if you understand how the accelergy tool generates the architecture reference table to estimate energy.
- Please look at the scale-sim code to understand how the "action_counts.yaml" file is generated. This file summarizes the action counts or activity of different components in the accelerator over the complete computation time.
- Think about ways of changing the code to be able to generate these actions after every few intervals instead of generating a summary at the end.

2. Hotspot 7.0 tool:
https://github.com/uvahotspot/HotSpot
Please go through the examples present here: https://github.com/uvahotspot/HotSpot/tree/master/examples
Understand the input file formats and think about ways of converting the scalesim output to generate a similar power trace for hotspot.

3. CNN: https://cs231n.github.io/convolutional-networks/: This is a good reference for understanding CNNs. The students can explore additional material available in this course.

4. SIMD vs. Spatial vs. Systolic Architecture:
a. Efficient Processing of Deep Neural Networks: A Tutorial and Survey - Good paper to understand reuse – is, ws, and os (takes references from Eyeriss); covers SIMD vs Spatial since Eyeriss is a spatial architecture.
b. https://arxiv.org/pdf/1704.04760.pdf: Google TPU is one of the architectures used in scale-sim. It is used in systolic PEs and could be a good read.

Thanks and Regards,
Ayushi Agarwal

On Wed, Feb 5, 2025 at 11:42 PM Preeti Ranjan Panda <panda@cse.iitd.ac.in> wrote:

> Dear COL719 students,
>
> The assigned projects to COL719 student groups are uploaded on Moodle.
> Please take a look. There are 3 students for whom I don't have any
> preferred groupings; not sure if I missed any communication. I will wait
> for a confirmation from those 3 that they are doing the projects alone.
> There are students marked in red, to whom I have not assigned any
> project based on attendance so far; I am assuming they are withdrawing
> from the course. I will upload an edited file after I receive any
> updates from you.
>
> Tentative names of senior researchers who will be monitoring the
> project, are given alongside. They will communicate with you for initial
> documents, experimental platform, etc. Note that they are NOT TAs for
> the course, and are not obliged to spend time on the projects. Their
> follow-up will be proportional to the seriousness shown by the students,
> as evidenced from the progress.
>
> Regards,
> Preeti