University of Pennsylvania
Department of Electrical and System Engineering
System-on-a-Chip Architecture

ESE532, Spring 2017 Parallelism and Design Space Milestone Friday, March 24

Due: Friday, March 31, 5:00PM

Group: Identify parallelism opportunities, design space axes, and benefit equations.

Individual: Writeup.

1. Parallelism Opportunities: identify parallelism opportunities for all tasks that needs acceleration for the real-time goal, both within and among functions. What can run in parallel? What kinds of parallelism are potentially applicable? What requirements and dependencies prevent parallel operation and specific kinds of parallelism?

2. Identify major design space axes that could be explored.

   - For this milestone, aim for breadth (quantity of options)
   - Each axis description can be 2-3 sentences. Identify challege being addressed, basic solution opportunity, and continuum.
   - Include a simple equation to illustrate ideal benefit (e.g., running N tasks in parallel reduces runtime by a factor of N; $T(N) = T(1)/N$).
   - At a minimum, cover all individual functions that must be accelerated for the 4× full-application speedup goal
   - Aim for at least 6 axes per function, as well as 3 for each function interaction (e.g., producer-consumer pair)

Note: you should be prioritizing design options to explore and experimenting with several of your top options during this week.