AI Processor Design Proposal

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AI Processor Design Proposal

- Objective
  - **Design your own AI accelerator**
  - Not necessarily what you will implement in the final project
  - Be creative while keep it realistic
- This is a team project
  - Max 5 person/teams
  - We will draw lots by group on 4/16 to determine the order for deciding presentation dates.
    - Please group up team before then.
- Proposal Presentation
  - 5/7 and 5/14
  - 15 mins presentation + 5 mins QA
  - In-person presentation
  - Upload your slide to Moodle before your presentation date

Grading

- Presentation
  - 25%
- Architecture Completeness
  - 25%
- Analysis
  - 25%
- Innovation
  - 25%

Design Content

- Design your own accelerator from different perspective
  - Architecture
  - Memory hierarchy
  - Network on Chip
  - Dataflow
  - Mapping optimization
  - Data preparation
  - Supported operations
- Detail analytical report of your design is highly recommended
  - Roofline model
  - Bandwidth requirement
  - Peak performance
  - Utilization rate of different operation
  - DRAM access frequency
  - SRAM size
  - Energy consumption/power efficiency

Design Principle

- Design proposal is free of format
- But the following question guide you through the design phase
  - What is the target **operations** you are accelerating?
  - What is the **basis** of your design?
  - What are your **innovation** from the basis?
  - What is your **proposed design**?
  - How do you **evaluate** your design?
  - What is your **analysis** of your design?
  - What is the **bottleneck** of your design?
  - What **questions** are you left with?