ECE 8823 - Interconnection Networks
Project Proposal: Heterogeneous Architecture Design for Mesh

Name: Wan-Chen Yeh

- **Proposed idea:**

  The Mesh topology is the most interested NoC interconnect for its scalability and ease of implementation on silicon. It is known that the buffer and link utilization is not evenly distributed due to the center routers deal with more data than that of other routers. So far in class lab assignments, homogeneous architecture is applied on Mesh to make the implementation easier. However, the performance can be improved by changing its architecture according to the fact that the utilizations among the links and the buffers are non-uniform-distributed.

- **Approach:**

  - The experiments are performed through gem5.
  - The size will be 64 core (8x8) Mesh
  - The routing algorithm will be XY routing
  - Utilization analysis for different traffic: uniform-random, tornado, bit-complement
  - Some of the routers will be allocated with different numbers of virtual channels based on the results from utilization analysis.
  - The number of links (or link width) for each router will vary with the utilization results as well.
  - The performance analysis will focus on latency and throughput.