

Priority Queue, Wenqi Jiang, ETH Zurich

https://github.com/WenqiJiang/HLS-building-blocks/tree/main/priority_queue

▶ A Flexible Set of Templates for Priority Queues

- Systolic-register-array based priority queue implementation
- Wrapped in classes
- Some templates offer high flexibility – allow user to call many modularized member functions.
- Some templates are optimized for performance / resource utilization – but with limited user interface.

▶ It's hard to achieve both (a) high performance / low resource utilization (b) programming flexibility in HLS. For example, in OOP HLS programming, place an array (a) in a member function (b) as the class member can lead to significant resource consumption difference.

▶ Results:

- 2 clock cycles per insertion