BIB mitigation with AI

Simons progress report
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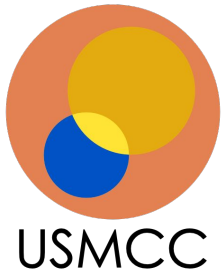
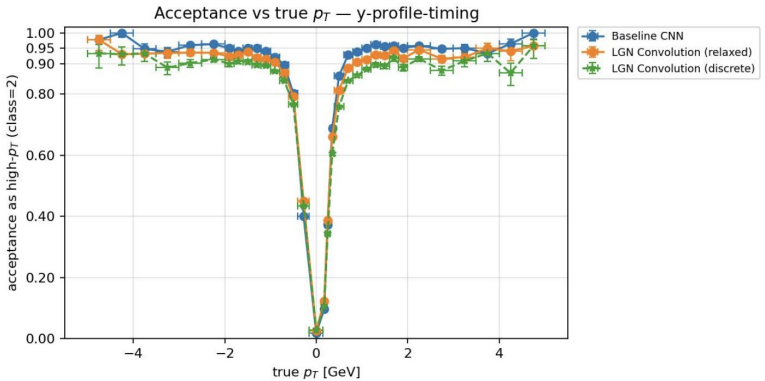


Major updates since last time

- **Meetings**: Wednesdays at 11 am ET [Indico]
  - All are welcome to join!
  - First meeting on 3/11 [Indico] – several contributions (not enough time to cover all!)

- **LGN Updates**:
  - Very nice introduction to LGNs (Lino)
  - Partially reproduced SmartPixels public results w/ conventional NNs (Mila)
  - LGNs (relaxed and discretized) perform nearly as well as conventional NNs on SmartPixels dataset

- **UTK ML for clustering**
  - ML applications to cluster shape to be discussed at next meeting
  - SNN for smartpixels study in revival/literature phase; training to be described
- **Chicago Smartpix NNs for BIB**
  - Understanding details of hyperparameter tuning.
  - Lab testing of filtering ASIC. (lower priority recently
  - Rough investigation of SEE effects in weights.



Current roadblocks

- No significant roadblocks

- **LGN** – unclear why we cannot exactly reproduce public results with SmartPixels dataset
- **Smartpix Training** – Messy environment for quantized training and synthesis – QKeras out of date, hls4ml differences for Vitis and Catapult
- **Smartpix Lab Testing** – Noisy filter outputs make validation harder

Open tasks

- **LGNs**: proceed with synthesis
- **SNNs**: tasks TBD following literature conclusion
- **DNNs**: Want to refine estimates of chip area, data rate. Eventually validate synthesis on FPGA.
    - Longer term: consider differential distributions, digitization implementation.