# GPU implementation of HGCal 2D Clustering

# Starting Point

1. Latest CPU kdTree-based version of HGCal 2D clustering algorithm in CMSSW_10_6_0_pre2
2. Input data structure -- 2D histogram
3. Code of this effort from previous Hackathon

# Goal

1. CPU histogram-based clustering
2. GPU histogram-based clustering
3. Get same result as CPU kdTree-based clustering

# Today

1. Established starting point: setup and run.
2. Checked the result from existing code from previous Hackathons. Discrepancy in density and clusters between CPU kdTree-based
3. Started to develop our functions
    a. calculateDistanceToHigher

# Tomorrow

1. Complete `calculateLocalDensity` for CPU and GPU histogram-based functions. Fully synchronized with CPU kdTree-based one.
2. Work on `calculateDistanceToHigher` CPU and GPU histogram-based functions. And compare the results with CPU kdTree-based one