Design of a Compact Hough Transform for a new L1 Trigger Primitives Generator for the upgrade of the CMS Drift Tubes muon detector at the HL-LHC

there is plenty of real-time pattern recognition algorithms
there is plenty of Hough Transform-based ones

why a new one?

our target applications include triggers and data filters

you need to be extremely fast, efficient, precise, robust
you work on rather poor input data (small amount, relevant noise/background)
you must make the most of your computing resources (i.e. FPGA)

the DT trigger of the CMS experiment at the HL-LHC is a fitting study case, although we are extending our scope beyond it
our design (patent pending) is based on the strategies used for input data handling before and after processing

example #1: input data redirection for parallel processing of small subsets, results combined together

example #2: can the transfer of HT load from parameter space to input data combinatorics be a ‘win’ for our target applications?

* complexity: HT histogram size, algebra, # of computations, # of comparisons, # of loops ...
questions and feedback will be welcome!

you can find me at wall # E-07