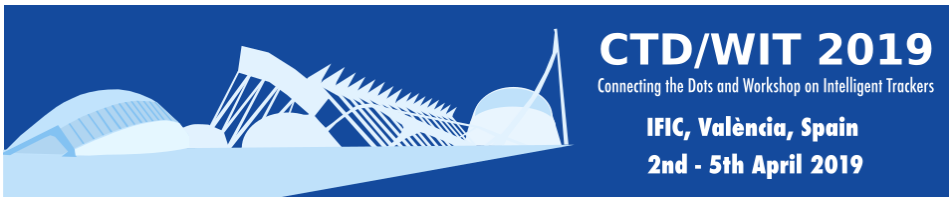

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Use of R-trees to improve reconstruction time in pixel trackers

Thursday, April 4, 2019 11:30 AM (25 minutes)

Computing time is becoming a key issue for tracking algorithms both online and off-line. Programming using adequate data structures can largely improve the efficiency of the reconstruction in terms of time response. We propose using one such data structure, called R-tree, that performs a fast, flexible and custom spatial indexing of the hits based on a neighbourhood organization. The overhead required to prepare the data structure shows to be largely compensated by the efficiency in the search of hits that are candidate to belong to the same track when events present a large number of hits. The study, including different indexing approaches, is performed for a generic pixel tracker largely inspired in the upgrade of the LHCb vertex locator with a backwards reconstruction algorithm of the cellular automaton type.

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Track Classification: 2: Real-time pattern recognition, fast tracking and performance evaluation