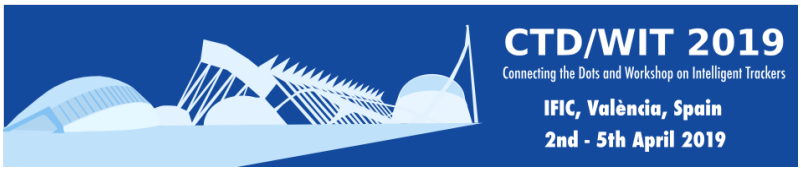
# Connecting The Dots / Intelligent Trackers 2019




**Tuesday, April 2, 2019 - Friday, April 5, 2019**

**Jardí Botànic de València**

# Scientific Program

# 1: Machine learning, algorithms and theoretical analysis

Mathematical evaluation of pattern recognition problems, fitting tracks beyond classical Kalman filters, effect of noise. Machine learning applied to charged particle tracking, software and firmware implementations, exploration of neuromorphic hardware.

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

New algorithms to find tracks. Software and firmware implementation for parallel and discrete pattern recognition, e.g. Hough transform approaches, look-up tables, associative memory, etc. Timing performance for fast tracking or on-line trigger system. Examples of implemented pattern recognition problems and solutions with emphasis on new challenges and limits of scaling existing approaches.

# 3: Advanced usage of tracks

Advanced algorithms to build high level information from tracks, e.g. conversion, vertexing, jets, tau, flavor tagging and pile-up mitigation.

# 4: Intelligent tracking detectors and sensors

Detectors providing higher level primitives than space points or filtering by using local processing. Detector interconnections (wireless, either optical or Radio Frequency). Sensor development for future HEP physics experiments, addressing radiation hardness, lightweight detectors, fast detectors, monolithic sensors, etc.

# 5: 4D tracking and vertexing using precision timing information

The usage of precise timing information in the tracking and vertexing. Precise timing measurements.

# 6: Architectures and techniques for fast track reconstruction

High Performance Computing and accelerator-based computing (GPGPU’s, FPGA’s), vectorialization and multithreading.

# 7: Special & beyond the conventional tracking

Special sessions and non-HEP talks, software techniques for novel detector concepts and interdisciplinary developments in the field of data science, e.g. neuro inspired computing, Brain activity, connectivity.