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# Quantum Track Reconstruction Algorithms for non-HEP applications

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The expected increase in simultaneous collisions creates a challenge for accurate particle track reconstruction in High Luminosity LHC experiments. Similar challenges can be seen in non-HEP trajectory reconstruction use-cases, where tracking and track evaluation algorithms are used. High occupancy, track density, complexity and fast growth therefore exponentially increase the demand of algorithms in terms of time, memory and computing resources.
While traditionally Kalman filter (or even simpler algorithms) are used, they are expected to scale worse than quadratically and thus strongly increasing the total processing time. Graph Neural Networks (GNN) are currently explored for HEP, but also non HEP trajectory reconstruction applications. Quantum Computers with their feature of evaluating a very large number of states simultaneously are therefore good candidates for such complex searches in large parameter and graph spaces.
In this paper we present our work on implementing a quantum-based graph tracking machine learning algorithm to evaluate Traffic collision avoidance system (TCAS) probabilities of commercial flights.

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## Secondary track (number)

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