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The CMS track trigger for the High Luminosity LHC

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The High Luminosity LHC is expected to deliver luminosities of 5 × 10ˆ34 cm-2s-1, with about 200 proton-proton interactions per bunch crossing, on average. For their physics program to take advantage of these high collision rates the LHC experiments need to redesign their trigger systems so that they identify charged particle tracks at the very first stage of triggering. The CMS track trigger upgrade will make use the silicon tracker detector upgrade to measure with precision, with a latency of about 5 microseconds, the transverse momenta of all charged particles, for particles with momentum above 2 GeV/c. We discuss the challenges that this project entails and different algorithmic and architectural solutions that can help overcome them. We also describe the current status and plans for these projects.

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