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I am a researcher in particle physics at CERN and over several years I have contributed to the high-energy physics research program of CERN within the CMS Collaboration covering various aspects from detector development to data analysis.

I analyze large amount data from the LHC proton-proton collisions to search for physics phenomena beyond the standard model with the aim of advancing the understanding of the fundamental nature of matter and energy.

The LHC will provide a rich physics program for at least the next 20 years. In order to fully explore the new high-energy frontier, it will necessitate in mid-2020's an upgrade to HL-LHC, aimed at increasing the luminosity of the machine by a factor of 5. With data rates more than 10 times previously achieved, this upgrade of the collider will pose major challenges to the entire detector system.

Looking for rare physics processes in such complex collision environment will require novel online and offline data-acquisition techniques and algorithms. I am working on novel deep-learning methods offering the possibility to efficiently separate rare signals from a large noisy background. The idea here is to perform real-time inference (few microseconds) of deep neural networks on AI-oriented electronic devices, such as Field Programmable Gate Arrays, Tensor Processing Units, and other custom integrated circuits with great advantage for the detector physics performance.

