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VirtuaLearn3D: A tale of point clouds and synergies

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VirtuaLearn3D++: Algorithms from unstructured data spaces. From geography and engineering to high-energy physics.

Finding general solutions for geometric problems has been a complex concern thoroughly studied since the XIX century. The fundamental contribution of David Hilbert through the Nullstellensatz equipped us with a dictionary between algebra and geometry. Then, any geometry that can be translated into algebra, the fundamental language of algorithms, can be computed. The VirtuaLearn3D++ computational framework provides general algorithmic solutions to any problem whose geometry can be represented as a finite set of points. So far, this framework has been used to solve scientific and industrial problems in the domains of geography and engineering, like leaf-wood segmentation and point-wise classification in urban contexts. This outstanding technology has been scientifically proven to generate models solely from simulations that generalize to unseen real data. Potential applications to high energy physics, e.g. data acquisition and trigger, will be discussed.

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