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Henry Adams*, Colorado State University, Department of Mathematics, 1874 Campus Delivery, Fort Collins, CO 80523. *Applied topology: From global to local.*

Through the use of examples, I will explain one way in which applied topology has evolved since the birth of persistent homology in the early 2000s. The first applications of topology to data emphasized the *global* shape of a dataset, such as the three-circle model for 3×3 pixel patches from natural images, or the configuration space of the cyclo-octane molecule, which is a sphere with a Klein bottle attached via two circles of singularity. More recently, persistent homology is being used to measure the *local* geometry of data. How do you vectorize geometry for use in machine learning problems? Persistent homology, and its vectorization techniques including persistence landscapes and persistence images, provide popular techniques for incorporating geometry in machine learning. I will survey applications arising from machine learning tasks in agent-based modeling, shape recognition, archaeology, materials science, and biology. (Received August 23, 2020)