Computational topology for safe, reliable, explainable and green Artificial Intelligence

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Abstract

In this talk, we will present the European project REXASI-PRO (REliable & eXplAinable Swarm Intelligence for People with Reduced mObility), an interdisciplinary initiative aimed at developing artificial intelligence systems that are not only safe, trustworthy, and explainable, but also energy-efficient and environmentally sustainable. The main practical application of the project is to build a fleet of autonomous wheelchairs designed to navigate in closed environments such as hospitals or nursing homes. We will briefly show the work carried out by the CIMAgroup research group (University of Seville) within this project, which has focused on two tasks. The first one is the study of data-centric techniques to reduce energy consumption during the training of Machine Learning models. In the second, we will make use of computational topology tools to analyze the performance of different navigation algorithms, with the aim of determining which ones generate a more orderly movement in each possible scenario.