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Approaches to Hard (and Potentially Deep and Wet) Problems in Computational Geometry

Path planning gives rise to NPhard problems in geometry, as do placement problems in wireless sensor networks. Theoretical methods for dealing with hardness include approximation, probabilistic, and FPT approaches. We review some results, then describe an approach that combines probabilistic methods, simulation, and experimentation to modify the initial geometry problem, with success defined experimentally. We describe this process in the context of path planning and device placement for eventual underwater environmental monitoring applications.