An Introduction to Geometric Complexity Theory

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The Geometric Complexity Theory (GCT) program was introduced by Mulmuley and Sohoni to attack fundamental lower bound problems in computational complexity theory- -such as P vs NP-- using algebraic geometry and representation theory. In addition to presenting the basic structure of the GCT program, we hope to point out some of the prominent obstacles to be overcome in GCT, and to suggest some speculative directions for potential progress.