BOUNDS FOR THE NUMBER OF REAL SOLUTIONS TO SYSTEMS OF EQUATIONS

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ABSTRACT. Computing, counting, or even deciding on the existence of real solutions to a system of polynomial equations is a very challenging problem that is important in many applications of mathematics. There is an emerging landscape of structure in the possible numbers of real solutions to systems of polynomial equations. These include fewnomial upper bounds, gaps or congruences, and lower bounds. My talk will survey what is known about these bounds, focussing on lower bounds— which are existence proofs of solutions—and open problems, including some concrete challenges.