

Numerically Solving Polynomial Systems with Bertini

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This book is a guide to concepts and practice in numerical algebraic geometry (the solution of systems of polynomial equations by numerical methods). Through numerous examples, it shows how to use the popular and widely-used Bertini software package to compute solutions, including documentation on syntax and usage options.

Numerically Solving Polynomial Systems with Bertini

- approaches numerical algebraic geometry from a user's point of view with many worked examples,
- teaches how to use Bertini and includes a complete reference guide,
- treats the fundamental task of solving a given polynomial system and describes the latest advances in the field, including algorithms for intersecting and projecting algebraic sets, methods for treating singular sets, the nascent field of real numerical algebraic geometry, and applications to large polynomial systems arising from differential equations.

This book is appropriate for senior undergraduate or beginning graduate students with a computational focus and practicing engineers and scientists who want to learn about numerically solving systems of polynomial equations. A knowledge of calculus and basic linear algebra is needed and beginning courses in numerical analysis and ODEs would be helpful.

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