

# Near optimal algorithms for structured matrices and for real and complex root refinement

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We combine some powerful techniques developed in the area of univariate root finding to devise new algorithms for refinement of isolated complex and real roots that have nearly optimal Boolean complexity. One of the main ingredients is multipoint evaluation, which in turn is closely related to fast computations with structured matrices. We present nearly optimal complexity bounds for almost all the basic operations with structured matrices.

Joint work with Victor Y. Pan.