A^1-Milnor number: counting zeros arithmetically

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Abstract: A celebrated result of Eisenbud–Kimshaishvili–Levine computes the local degree of a smooth function $f : R^n \to R^n$ with an isolated zero at the origin. Given a polynomial function with an isolated zero at the origin, we prove that the local A^1-Brouwer degree equals the degree quadratic form of Eisenbud–Khimshiashvili–Levine, answering a question posed by David Eisenbud in 1978. This talk will present this result and then discuss applications to the study of singularities if time permits. This is joint work with Jesse Kass.