The Polynomial Euclidean Algorithm and the Linear Equation $AX + BY = \gcd(A, B)$

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We consider a polynomial version of the Euclidean Algorithm and discuss solutions to the polynomial equation $AX + BY = \gcd(A, B)$ over a finite field. We see that in this setting the distribution of solutions to the polynomial equation mirrors the distribution of solutions in the corresponding integer case, but with intriguing differences as well.

Keywords: polynomials over a finite field, polynomial Euclidean algorithm