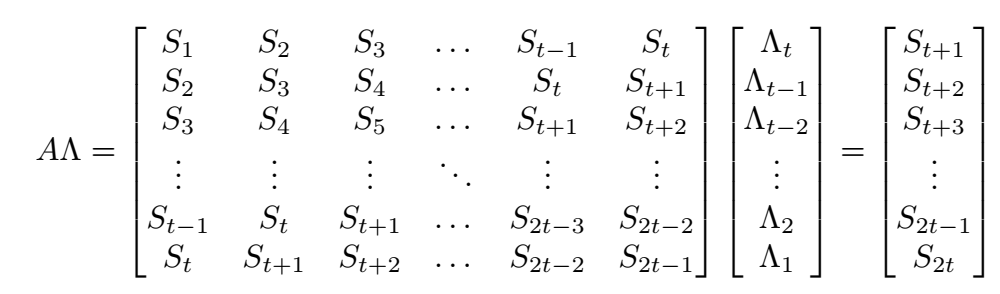
PGZ Decoding algorithm

1. Peterson-Gorenstein-Zierler algorithm basic

Compute the syndrome values by evaluating received polynomials and locators:



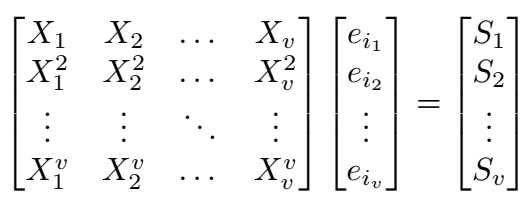
Solve the linear equations to get error locations:

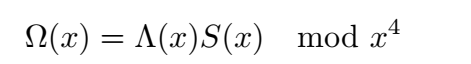


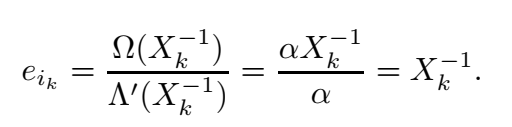
The matrix  is nonsingular(the determinant of  is not 0) if and only if there are exactly  errors.

Notice that the error locations are the inversion of roots of this linear system.

Get error magnitudes:

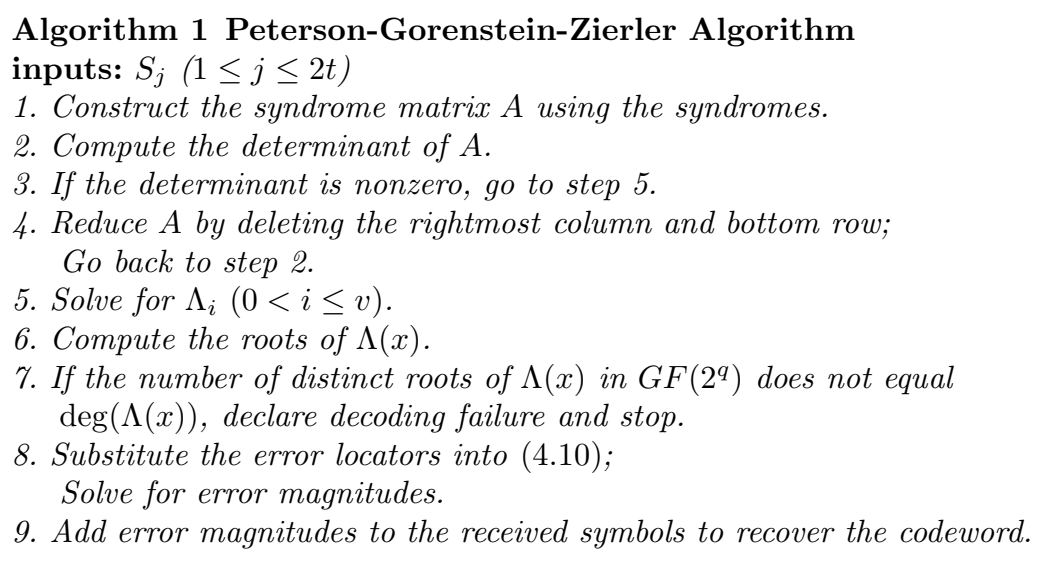






(notice the inversion calculation)

The procedure of this algorithm is summarize as below:



1. Decoder Architectures

The determinant and linear equations solving should be realized by combinational logic circuits. The mapping should be computed beforehand.

1. Complexity Analysis

See *Irene Giacomelli. "Improved Decoding Algorithms for Reed-Solomon Codes.", University of Pisa, 2012*：

