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A Method for Regularization of Evolutionary Polynomial Regression

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Abstract

While many applications require models that have no acceptable linear approximation, the simpler nonlinear models are defined by polynomials. The use of genetic algorithms to find polynomial models from data is known as Evolutionary Polynomial Regression (EPR). This paper introduces Evolutionary Polynomial Regression with Regularization, an algorithm extending EPR with a regularization term to control polynomial complexity. The article also describes a set of experiences to compare both flavors of EPR against other methods including Linear Regression, Regression Trees and Support Vector Regression. These experiments show that Evolutionary Polynomial Regression with Regularization is able to achieve better fitting and needs less computation time than plain EPR.

Keywords: evolutionary polynomial regression, regularization, feature extraction

1. Introduction

2 With notable exceptions (*e.g.* neural networks) machine learning regression
3 techniques utilize linear models. Looking for linear models has many advantages

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