



Nonlinearities in a multifactors model framework using Machine Learning

CrunchDAO

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abstract

CrunchDAO's Crowdsourced Investment Framework makes use of supervised learning to predict returns, which are residualized against, i.e., uncorrelated with linear econometric risk models. In order to obtain estimates with the desired properties, in this work we investigate the effect of design choices associated with feature engineering and model training. In particular, the orthogonality condition between factors and estimations can be imposed indirectly training on an orthogonal feature space. Alternatively, (non-linear) machine learning models can be trained, imposing orthogonalization in the definition of the fitness function. We show the consequences, in terms of out-of-sample accuracy, of these design choices, both for a feature space orthogonal and not orthogonal to risk factors. In the context of crowdsourced investment research through tournaments, we explore the potential of confidential computing to align the interests of tournament players with that of portfolio managers; from a game theory, perspective, we discuss the need to be able to define a Nash equilibrium in the CrunchDAO tournament.

Introduction

Methodology

Kernel Ridge Regression

Results

References

