Sequential Parameter Optimization for Symbolic Regression

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ABSTRACT

Modern Symbolic Regression (SR) engines are complex systems of many components, most of which require some form of parameterization. In this talk, we show how to apply Sequential Parameter Optimization (SPO) as a rigorous method for finding near-optimal parameter settings for SR systems. As modern SR systems often offer alternative operator sets for population initialization, variation, and selection, we also demonstrate how to use modern Design of Experiments (DoE) methods to find problem-specific near-optimal SR system configurations, in addition to near-optimal parameterizations for each selected system component. The experimental design for SR can somehow be tricky, because of interactions in the parameter settings. Methods for handling configurations of parameters which depend on higher-level parameters will be presented. Our exposition is based on a simple framework for statistical sound, reproducible empirical research in SR.

Categories and Subject Descriptors

I.6.5 [**Model Development**]: Computing Methodologies, Simulation and Modeling

General Terms

Algorithms, Experimentation.

Keywords

Symbolic regression, sequential parameter optimization

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