

Sensitivity, Interaction, and Robustness Analysis of the MFA-DSR Lifetime Model

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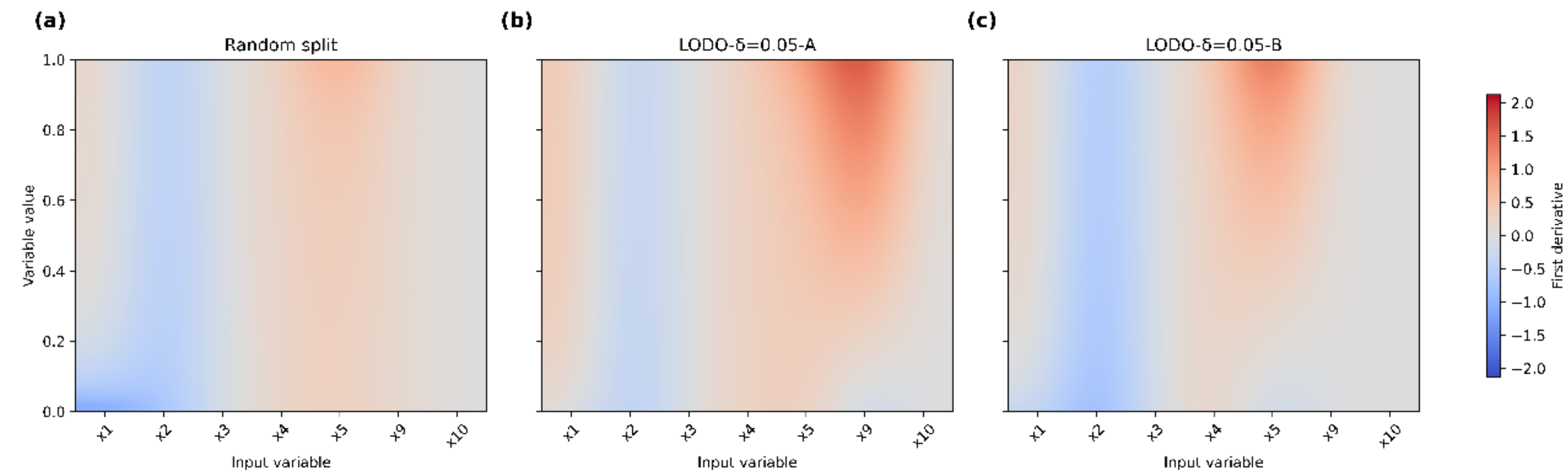
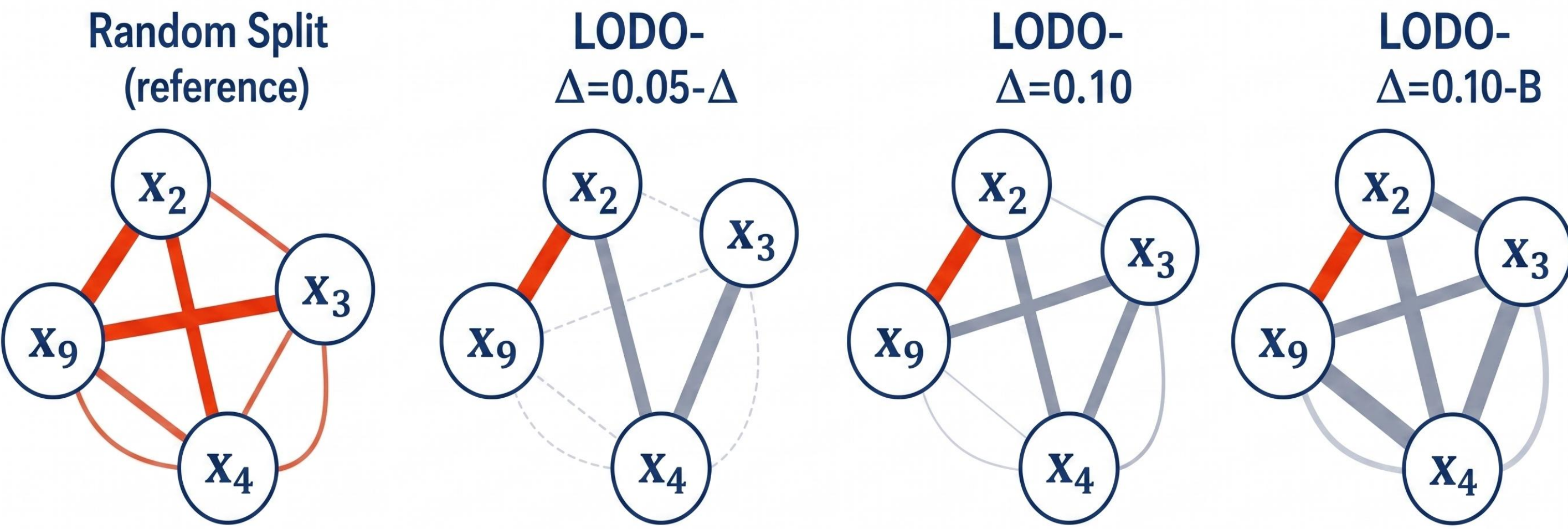
INTRODUCTION

Accurate prediction is necessary but not sufficient. Interpretability is required to uncover dominant variables and nonlinear contact-mechanics effects that govern fretting fatigue life.

This study provides a comprehensive interpretation of the MFA-DSR model through five complementary analyses:

1. Spearman correlation among inputs
2. First-order local sensitivity
3. Sobol indices: First-order S_1 and Total S_t
4. Second-order interaction analysis
5. Robustness across validation setting

GLOBAL CORRELATION



SOBOL ANALYSIS

