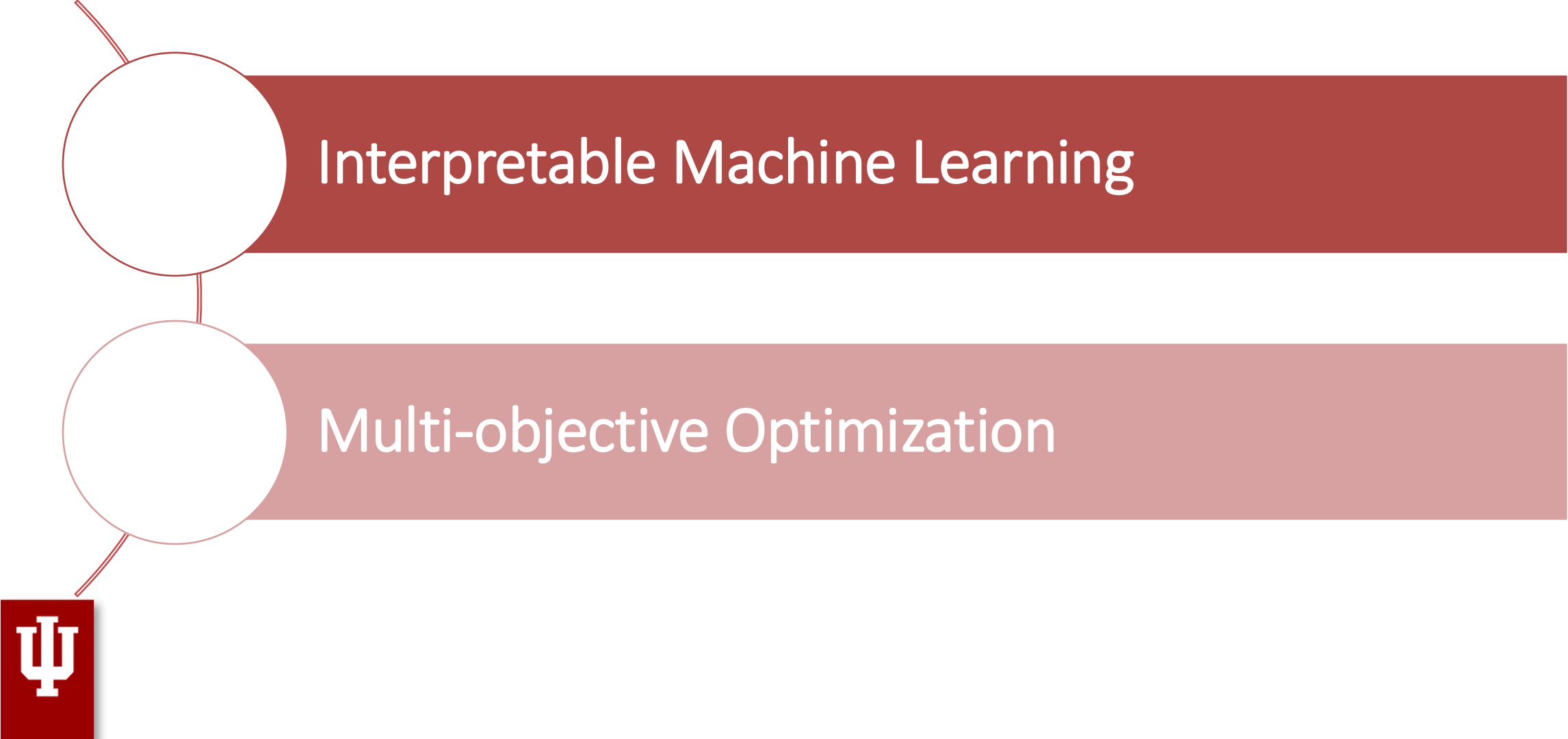


Leveraging AI in Research... To Study Complex Relations



Interpretable Machine Learning

Multi-objective Optimization



Interpretable Machine Learning

Criterion-Related Validity

- Weighted predictor composite validity in the holdout sample

Permutation Feature Importance

- Estimates the importance of a FFM factor/facet in predicting performance by permuting the factor/facets

Partial Dependence Plot

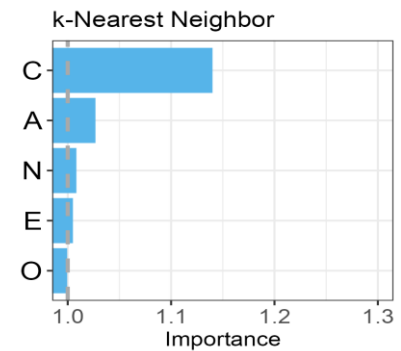
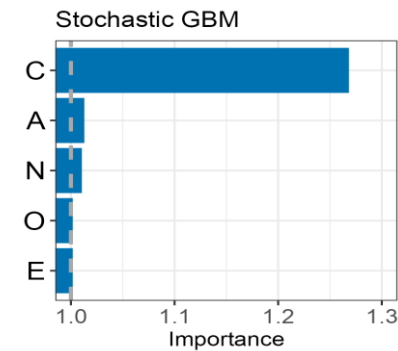
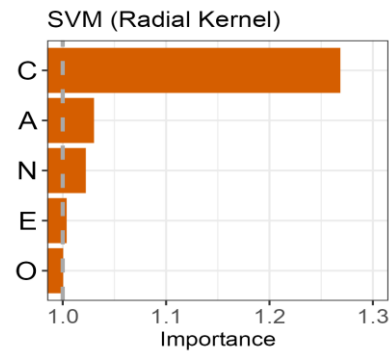
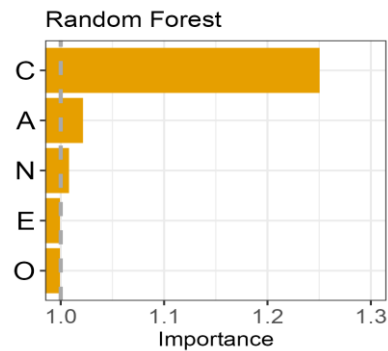
- Visualize the complex relation between each FFM factor/facet and job performance

Interaction H-squared Statistic

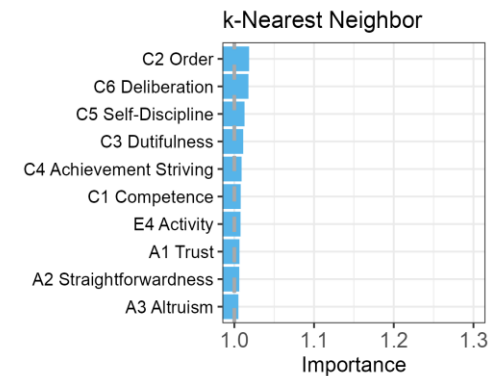
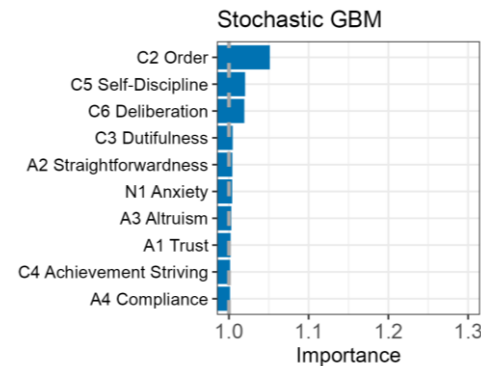
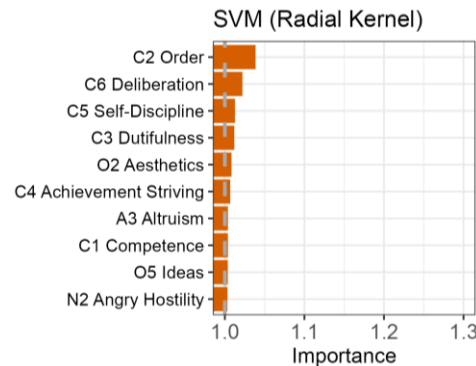
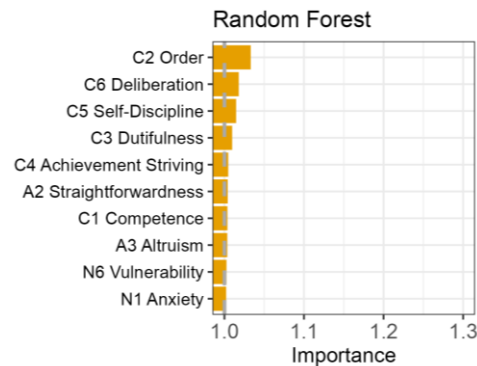
- Describe the strength of the interaction affects among the FFM factor/facets in predicting job performance

Interpretable ML: Feature Importance

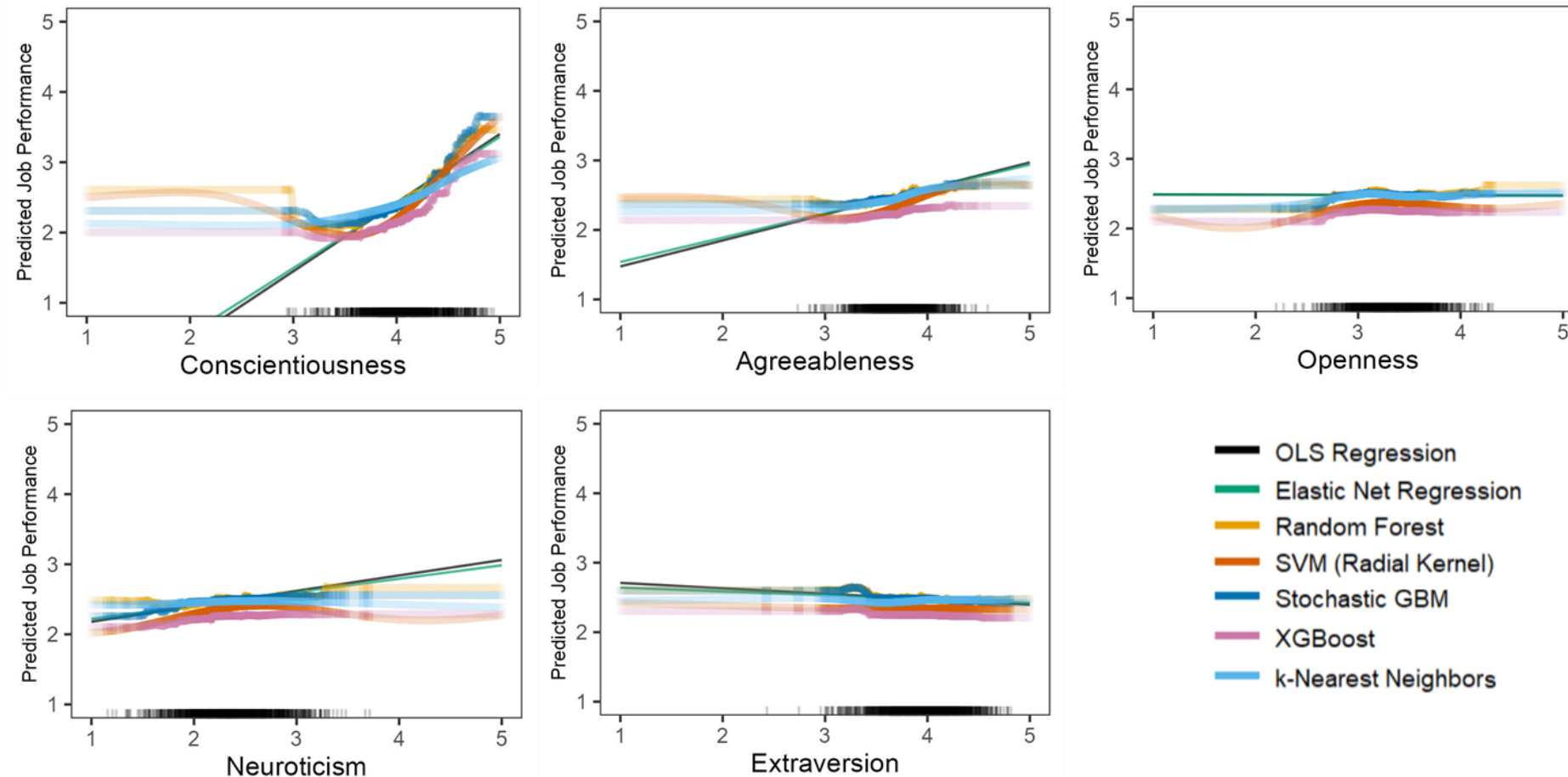
FFM Factors



FFM Facets



Interpretable ML: Linear/Curvilinear Relation



Multi-Objective Optimization

Weigh predictors to simultaneously optimize multiple objectives.

Regression Weighting

$$Y_1 \quad \xleftarrow{\text{Optimize}} \quad [\beta_1]^* \text{Predictor A} + [\beta_2]^* \text{Predictor B}$$

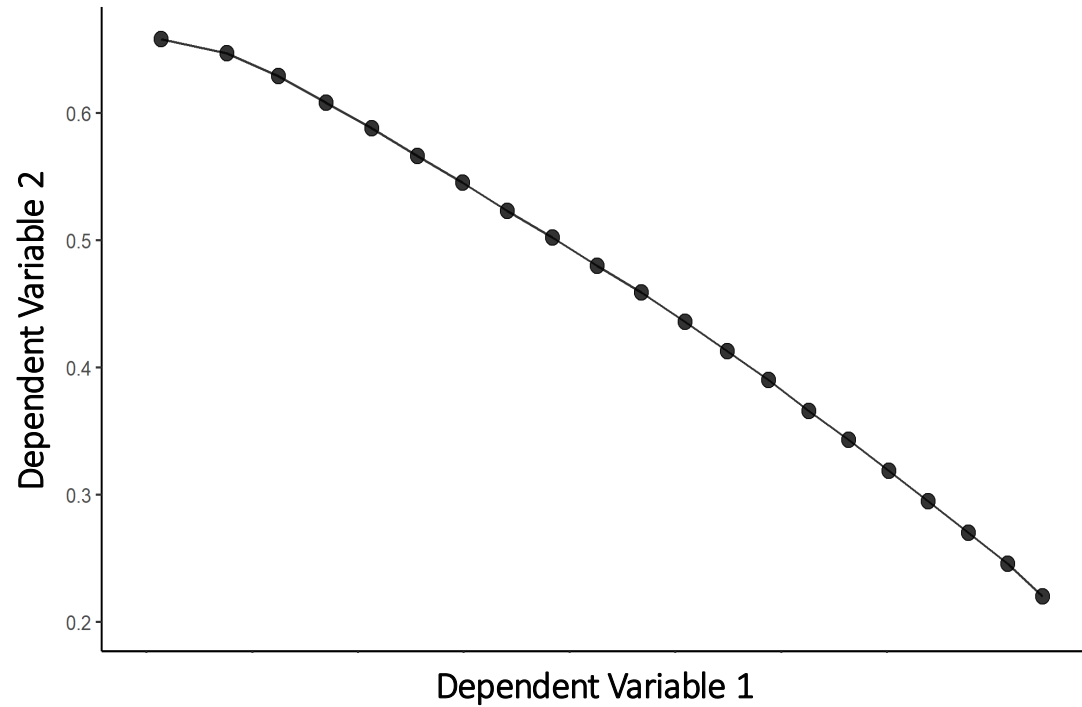
Pareto-Optimal Weighting

$$\left. \begin{array}{c} Y_1 \\ Y_2 \end{array} \right\} \quad \xleftarrow{\text{Optimize}} \quad [\beta_1]^* \text{Predictor A} + [\beta_2]^* \text{Predictor B}$$

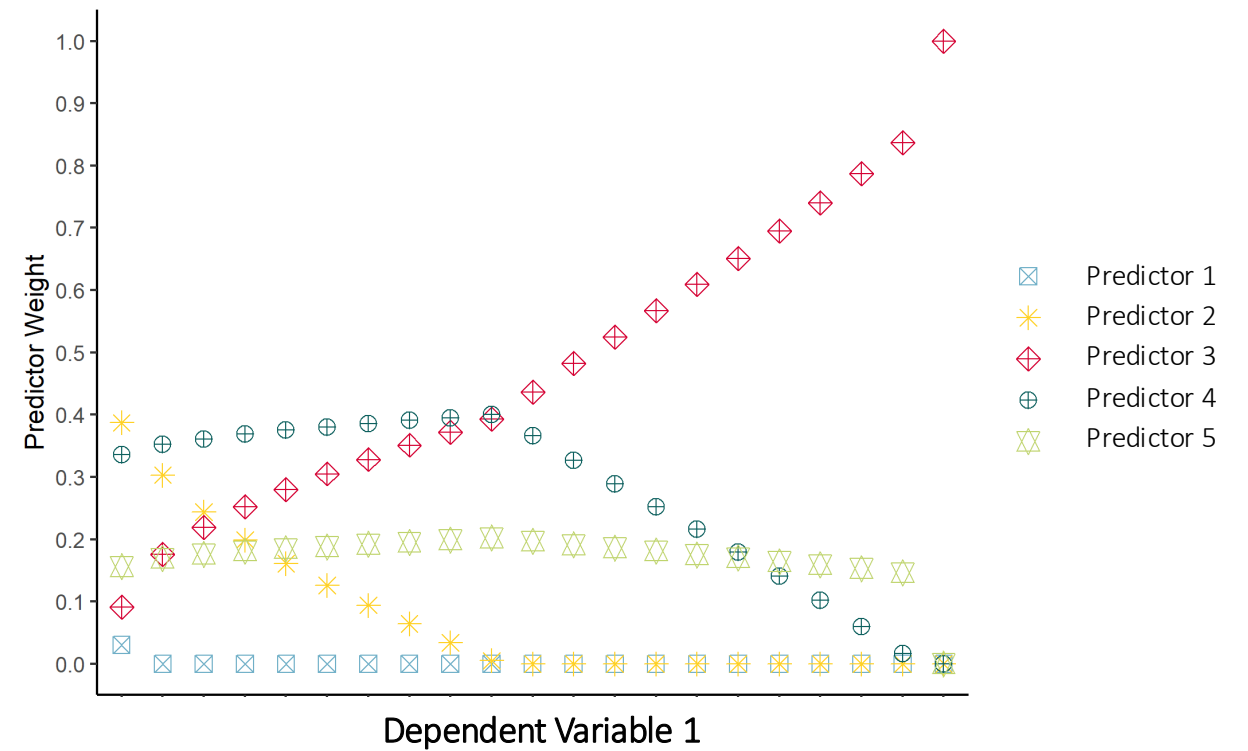


Multi-Objective Optimization

Pareto-Optimal Tradeoff Curve

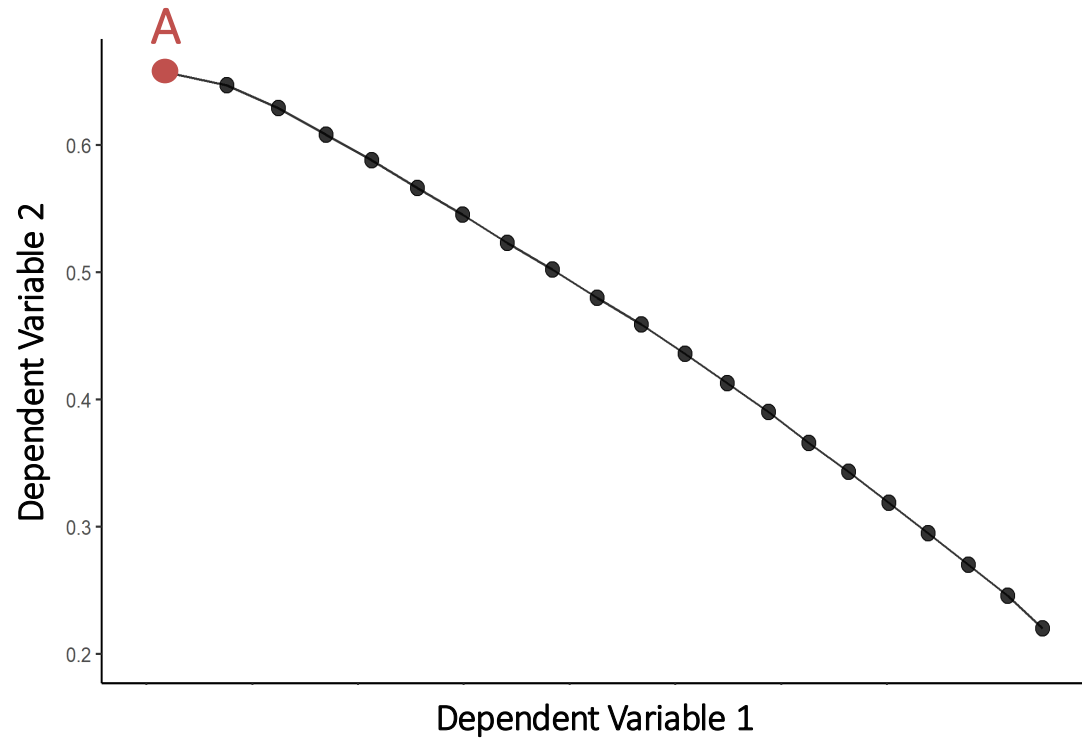


Corresponding Predictor Weights

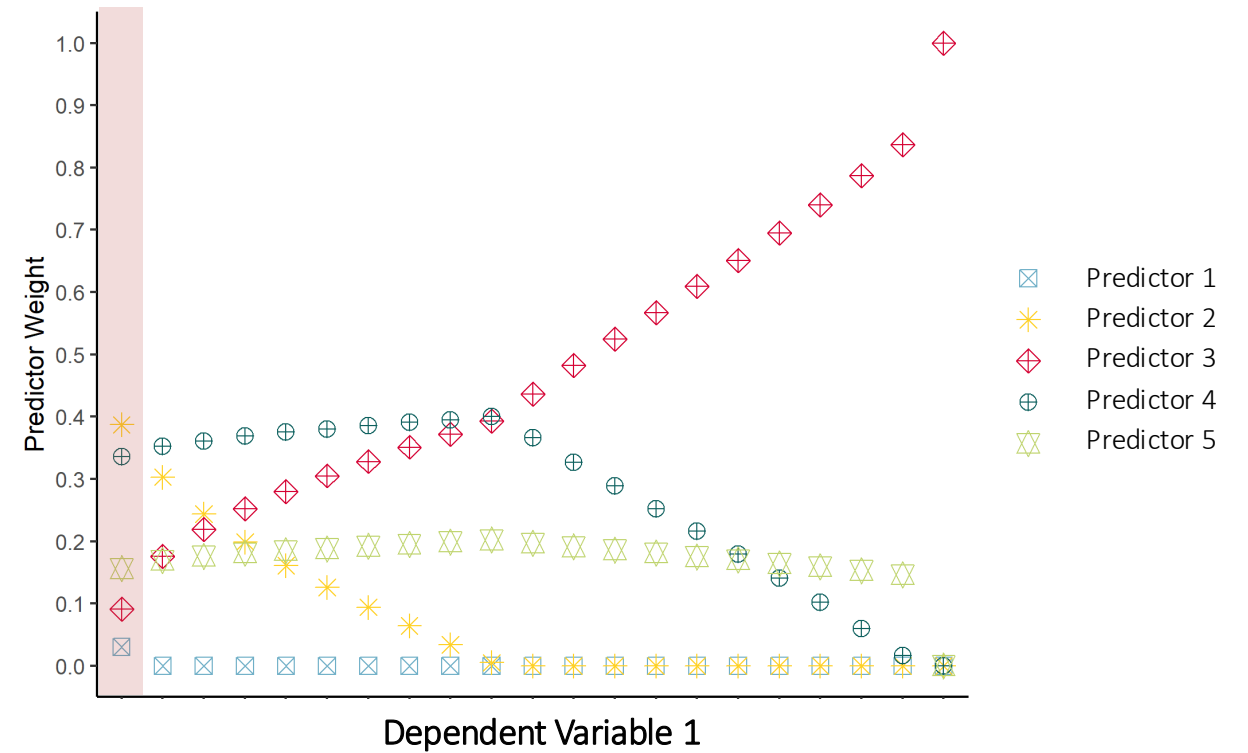


Multi-Objective Optimization

Pareto-Optimal Tradeoff Curve

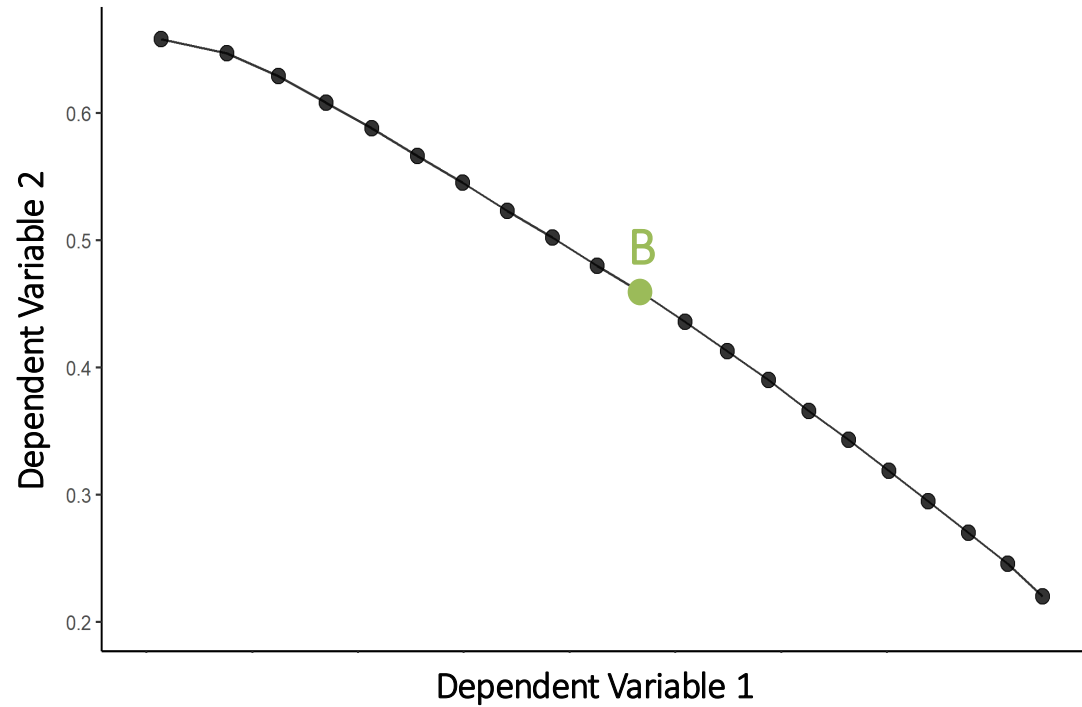


Corresponding Predictor Weights

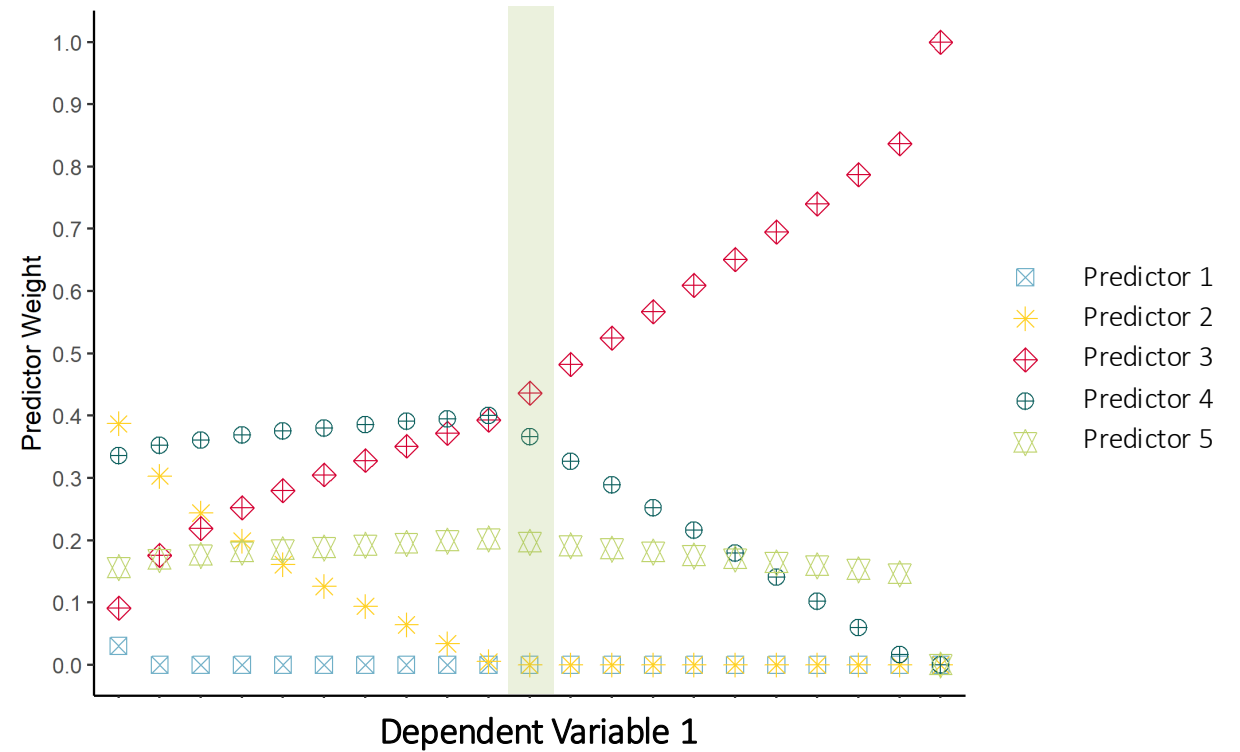


Multi-Objective Optimization

Pareto-Optimal Tradeoff Curve

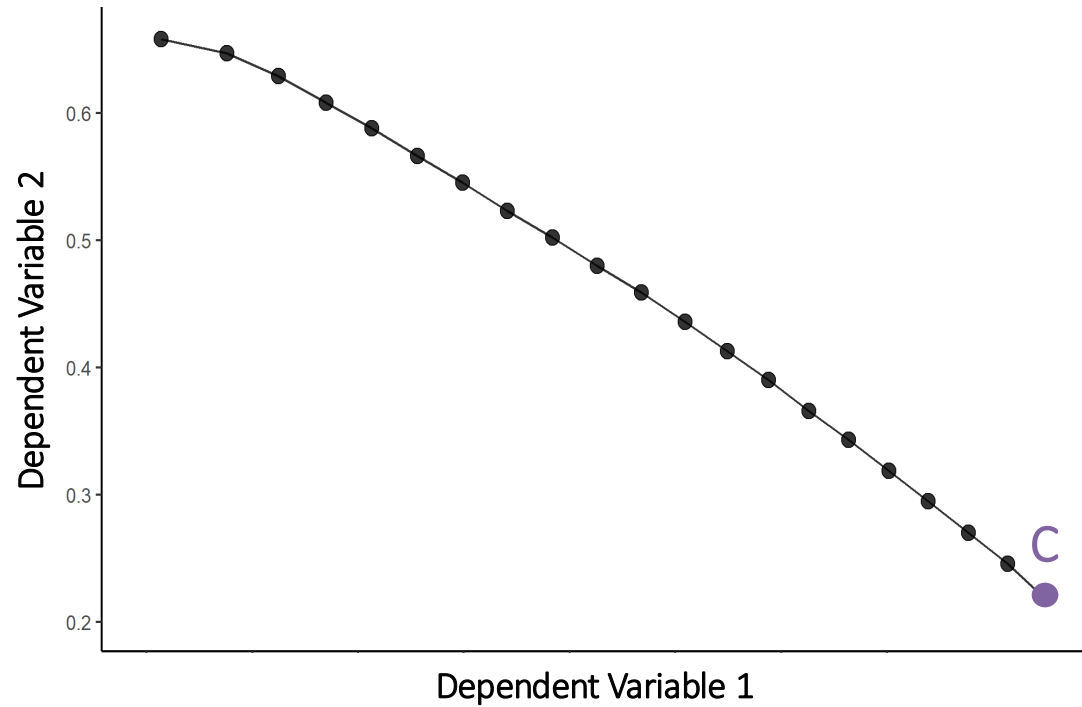


Corresponding Predictor Weights

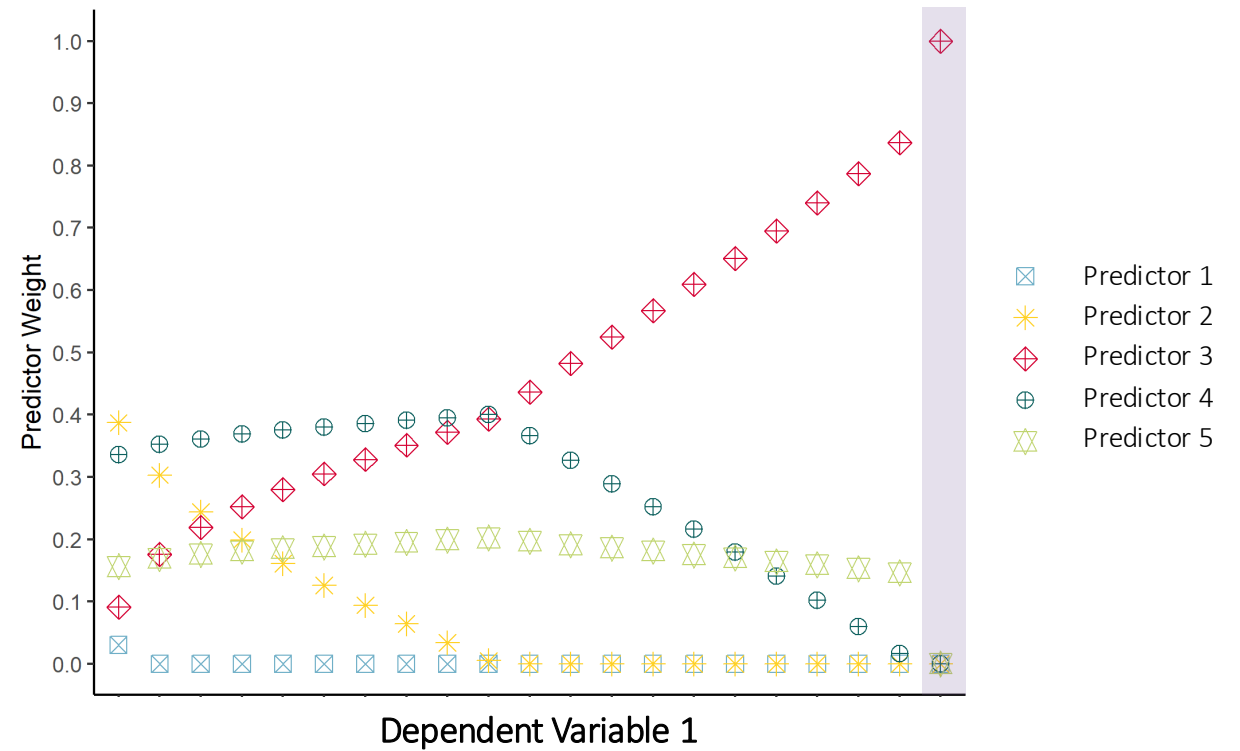


Multi-Objective Optimization

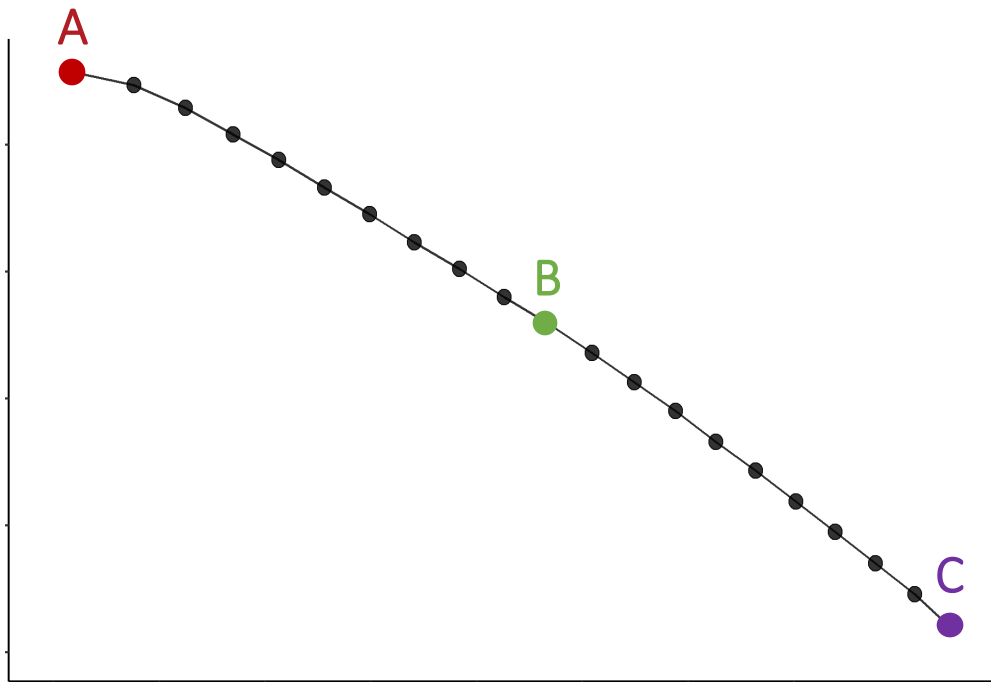
Pareto-Optimal Tradeoff Curve



Corresponding Predictor Weights



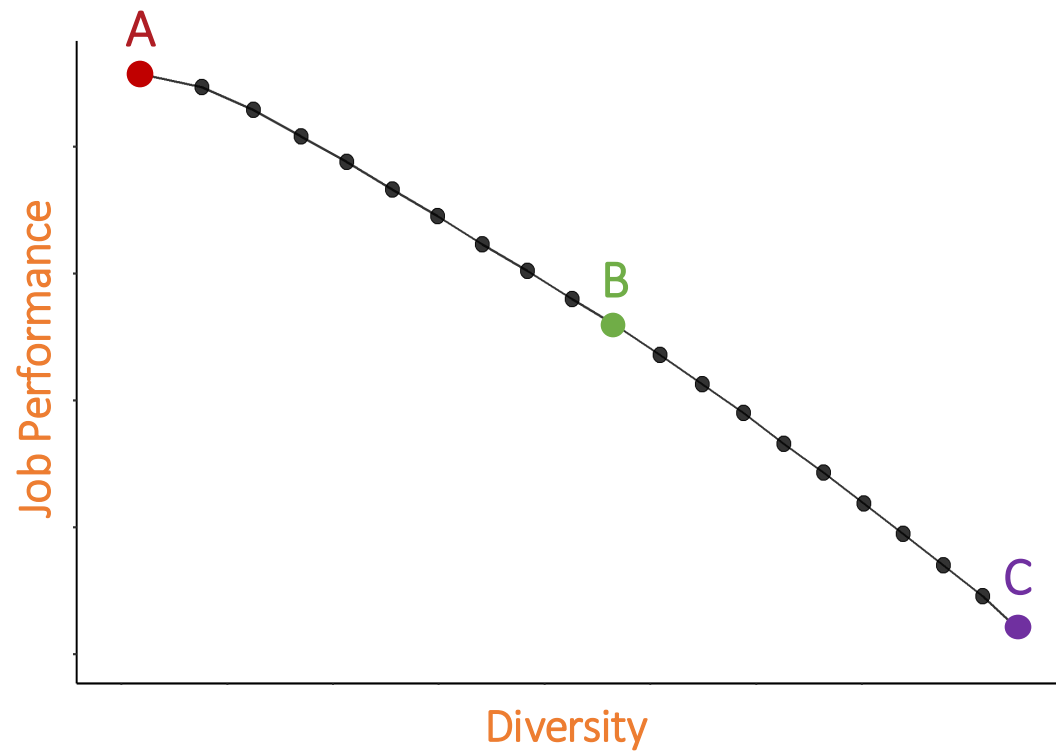
Studying Multiple Organizational Objectives



1. Optimize multiple organizational objectives
2. Understand the relationship among organizational objectives
3. How different predictors influence multiple organizational objectives simultaneously



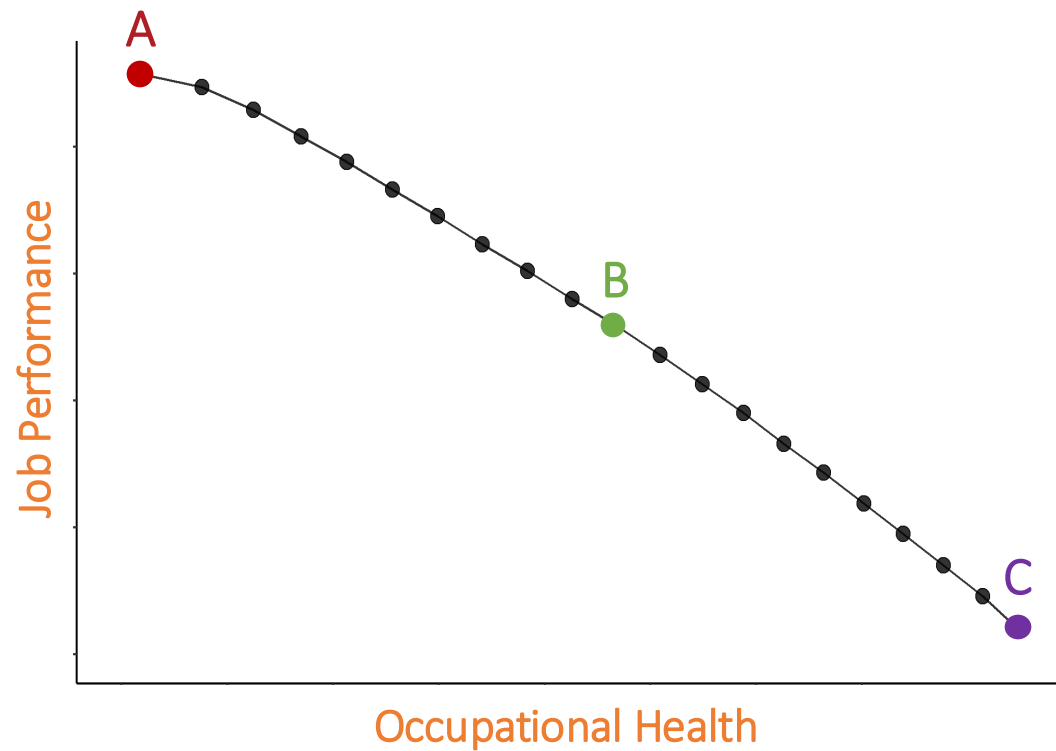
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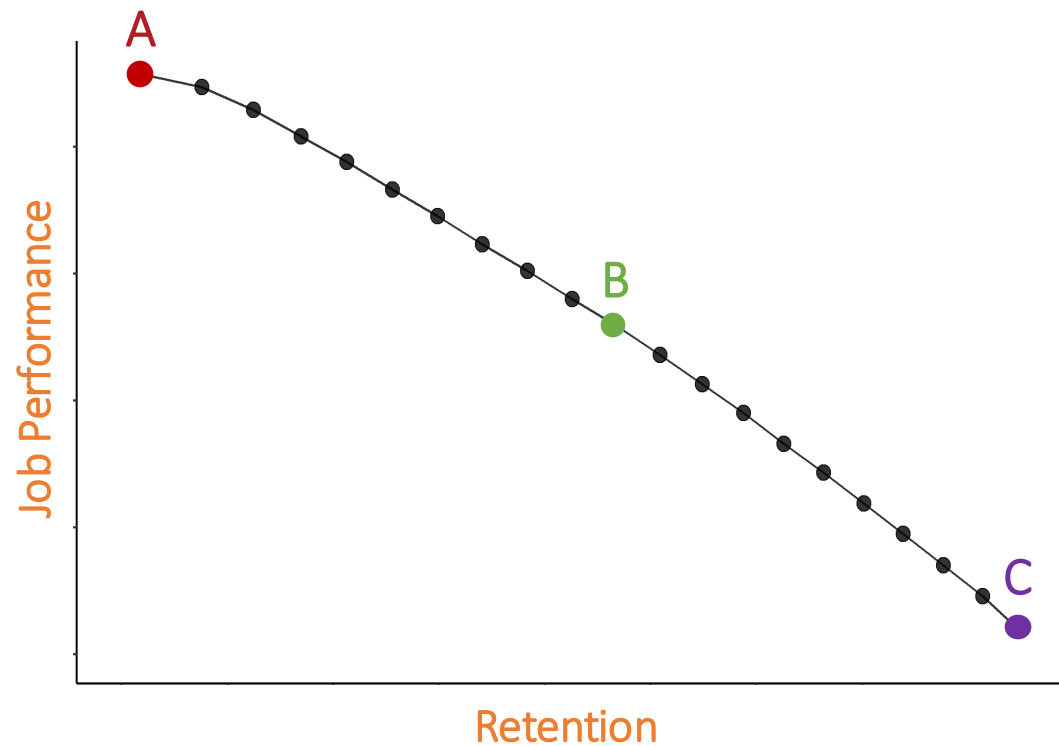
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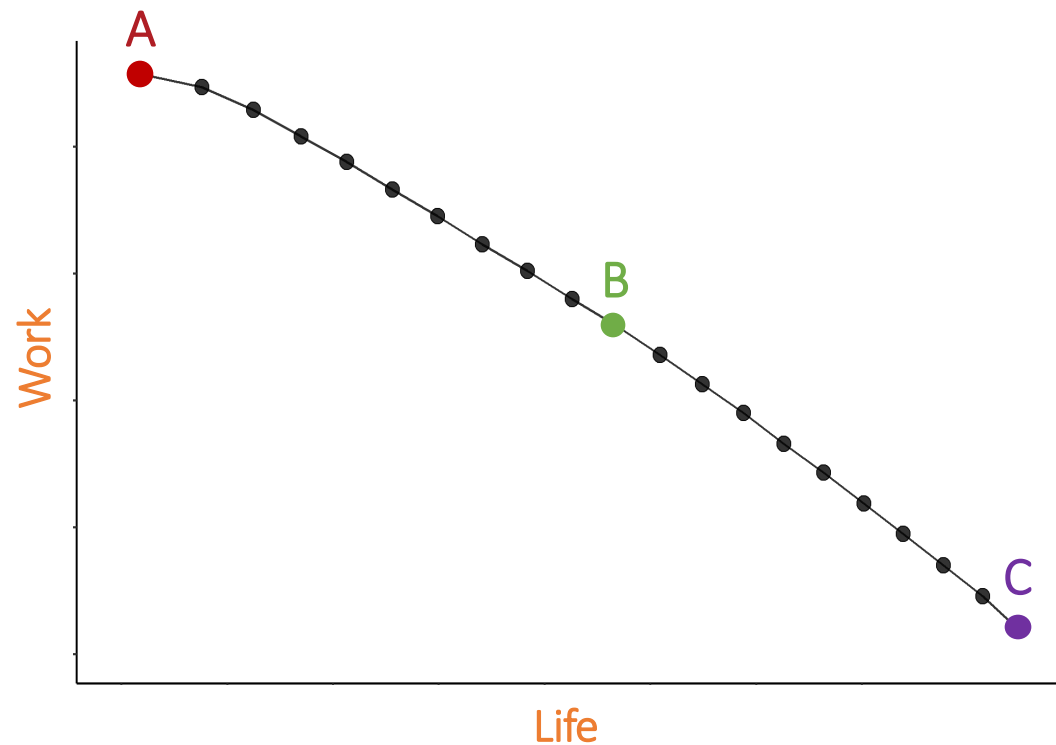
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