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Building Interpretable Methods For Identifying Bridge Maintenance Patterns

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Building Interpretable Methods For Identifying Bridge Maintenance Patterns

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According to the American Road and Transportation Builder Association, approximately 47,000 or 9% of bridges in the US, are structurally deficient. About 235,000 or 38% of the bridges require immediate maintenance. In order for bridge maintenance to be done effectively, bridge engineers need methods to extract insights from bridge inspection records. Previous researchers have identified factors influential to the bridge maintenance with machine learning. Previous researchers have developed machine learning models that have identified influential factors for bridge maintenance. However, even this previous research finds it hard to explain which factors affect maintenance patterns and were only limited to a specific state. With the help of big data, we propose a decision tree model that explains influential factors that affects maintenance patterns. The proposed method is not limited to a specific state. The decision tree model was able to achieve performance as high as 95% accuracy for the state of Ohio in comparison to previous research studies, and an average of 82% accuracy for bridges in midwestern states.