

# Machine Learning for Engine Suction Filter Testing at Skoda Auto

## Overview

*In partnership with Skoda Auto's Department of Engine Suction, a machine learning model was developed to predict whether a specific car design would pass or fail engine suction filter tests*

*under varying conditions, —mist, snow, dust, and wading water. The model achieved a 95% accuracy rate and featured calibrated probability to indicate the model's level of certainty.*



## Situation

Skoda Auto faced challenges in testing engine suction filters under multiple conditions. The existing approach involved conducting expensive real-world experiments that were both time-consuming and costly. A more efficient and reliable alternative was needed to reduce the number of these experiments.

## Solution

A machine learning model was developed to predict the outcome of engine suction filter tests for specific car designs. The model was trained on historical test data and fine-tuned to achieve an accuracy rate of 95%. Additionally, calibrated probabilities were integrated into the model to provide an additional layer of interpretability, indicating when the model might be uncertain.

## Keywords

engine suction filter  
machine learning  
predictive modeling  
test reduction  
calibrated probability  
Skoda Auto

## Requirements

Develop a machine learning model capable of predicting the performance of engine suction filters. Achieve high predictive accuracy to minimize the need for costly real-world testing. Integrate calibrated probability to indicate the model's confidence in each prediction.

## Benefits and Results

- The model's 95% accuracy significantly reduces the need for expensive and time-consuming real-world tests.
- The calibrated probability feature adds an additional level of reliability by indicating the model's confidence level, further enhancing the decision-making process.
- Skoda Auto now has a tool that can save both time and resources while maintaining high testing standards.
- The success of the model demonstrates the potential for machine learning to optimize other aspects of automotive design and testing.
- The calibrated probability feature could become a standard component in future predictive models, enhancing their reliability and interpretability.
- Feel free to make any adjustments to better match the specifics of the project, and let me know if there's anything else you'd like to add or modify.