

# Predicting Parking Ticket Appeals in Charlottesville

## A DS4002 Case Study by Masato Takedai

Parking in Charlottesville has long been a source of constant consternation. Students, professors, families, locals, and visitors all complain of the frequent ticketing and confusing signage around these historical Grounds and the city of Charlottesville. The city of Charlottesville publicly releases its data for parking tickets and appeal results, and as such, makes it possible to track and therefore model trends in the data surrounding Charlottesville. With this data, we can make use of modeling techniques to track and predict the success probability of appeals on tickets.

Having a better understanding of the Charlottesville area's parking ticket appeals situation will enable greater transparency and communication. Almost 10% of all tickets were appealed, and as such, there is great incentive to explore what kind of tickets were successful, and how the ticketing epidemic at C'ville may face some level of justice in the court system. With better knowledge and expectations of the appeal process, residents will be able to make better informed decisions on whether or not to appeal their tickets and see how ticketing policies have changed over time.

### **The Deliverable**

You are a data scientist tasked with determining whether machine learning models can accurately predict whether a parking ticket appeal will be successful in Charlottesville using the dataset provided by the city. You will use 3 models to determine the effectiveness of each: logistic regression, random forest, and SVM (XGBoost). The dataset contains many different fields about each parking ticket – but many are irrelevant to the problem, so you will take out and remove features, while also doing feature engineering to create new ones that are more relevant to the needs of the study. You will hopefully finish with a model with an accuracy of at least 60% and find that XGBoost has the best accuracy out of the three models.

**GitHub:** <https://github.com/MasatoTakedai/DS4002-Case-Study>