Wheels of Misfortune: Exploring Auto Theft Trends in Ottawa*

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The surge in auto theft rates across Canada has prompted car owners to become more vigilant regarding their vehicle's security. This paper gives a thorough examination of auto theft occurrences within Canada's capital, Ottawa. Focusing on the years 2018-2022, the paper provides a deep dive into the types of vehicles brands, model, and color targeted and offers insights into the neighborhoods within Ottawa exhibiting elevated rates of auto theft. Additionally, the study assesses factors such as the recovery rate of stolen cars, and provides solutions to improve vehicle security by understanding auto theft dynamics in the region.

1 Introduction

In recent years, there is a significant increase of auto theft rates across various cities in Canada. The country's capital, Ottawa has reported 221 stolen vehicles cases since January 1, 2024 (**citeCTV?**). This escalating trend in auto theft poses a considerable risk to public safety. Although Ottawa police have made efforts to mitigate such reports as well as educate the public, the number of reported cases continues to rise steadily, specifically from the years 2018-2023. However, questions regarding potential patterns in the types of cars targeted and the proportion of vehicles successfully recovered following theft have increased.

This paper aims to identify the gravity of auto theft as a pressing concern, particularly in Canada, in the (**Introduction?**). Subsequently, the (**Data?**) section focuses on the methodology for data collection and data cleaning. The (**Results?**) section delves into a comprehensive analysis of auto theft patterns in Ottawa from the years 2018-2022. Finally, in the (**Discussion?**) section, the paper explores potential drivers behind the escalation in auto theft rates, strategies for enhancing vehicle security, and prospective trends in auto theft.

*Code and data are available at: https://github.com/catherinee1216/AutoTheft_Ottawa.git.

2 Data

3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix B.

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i|\mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$
$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$
$$\sigma \sim \text{Exponential}(1) \tag{6}$$

We run the model in R (R Core Team 2023) using the `rstanarm` package of Goodrich et al. (2022). We use the default priors from `rstanarm`.

3.1.1 Model justification

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance θ.

4 Results

```
Warning in geom_histogram(stat = "count"): Ignoring unknown parameters:
`binwidth`, `bins`, and `pad`
```

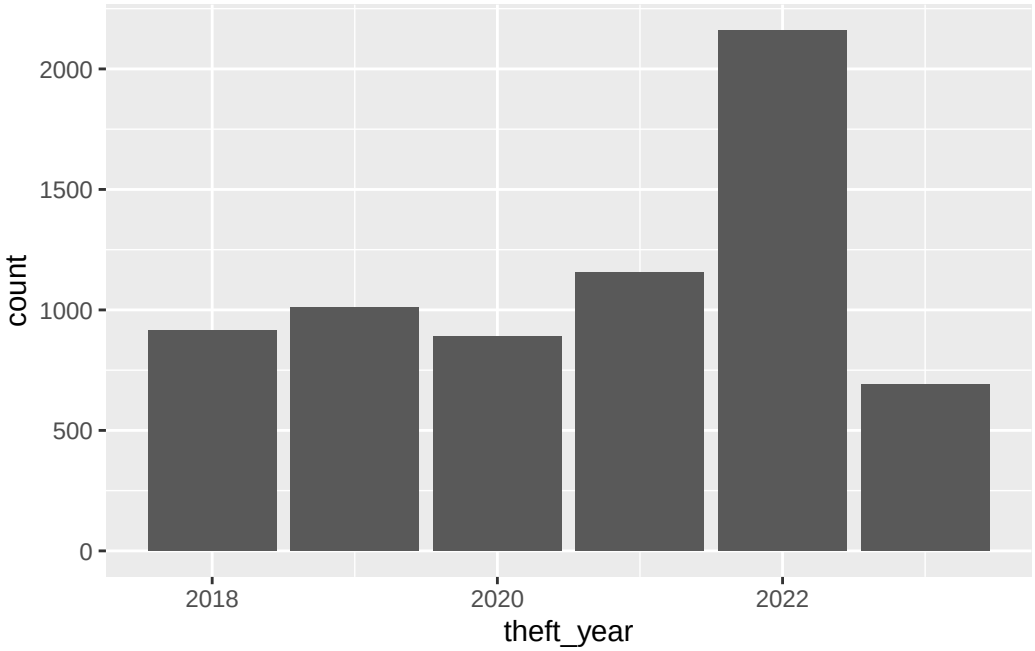

Figure 1: Bills of penguins

5 Discussion

5.1 First discussion point

5.2 Second discussion point

5.3 Third discussion point

5.4 Weaknesses and next steps

Appendix

A Additional data details

B Model details

References

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. "Rstanarm: Bayesian Applied Regression Modeling via Stan." https://mc-stan.org/rstanarm/.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.