# *Investigating Factors Influencing Squirrels' Attitudes towards Humans in NYC*

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# *Introduction and Motivation*

**Urbanization**

- Does it disrupt squirrel behaviors or do they “synurbanize”?

**Synurbanization**

- Refers to the adaptation of wildlife to living in urbanized contexts

**Research Question:** What factors affect squirrels’ indifference to human presence?

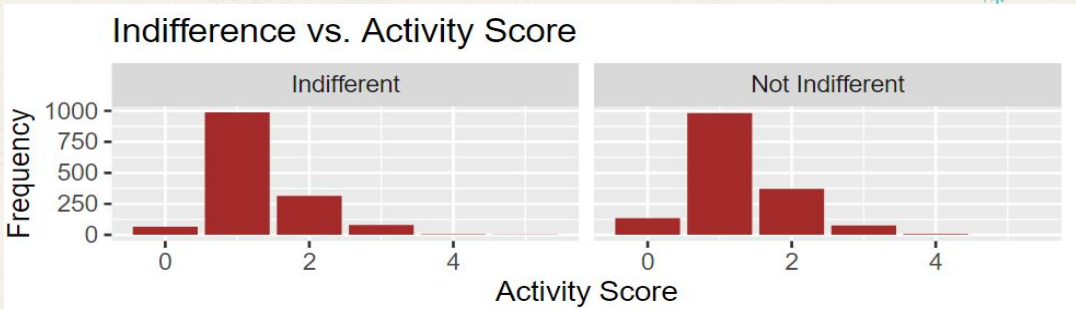
**Larger Context:** Are squirrels' attitude to humans correlated more with human activity or other factors? Could indifference to humans on account of synurbanization affect, for example, the spread of disease?

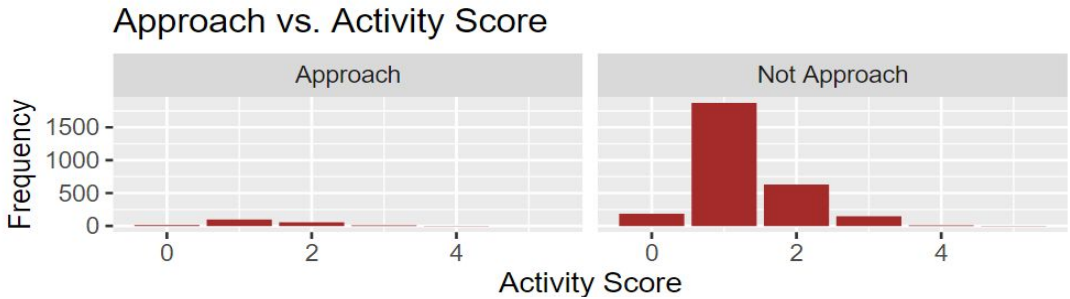
# *Intro to Data*

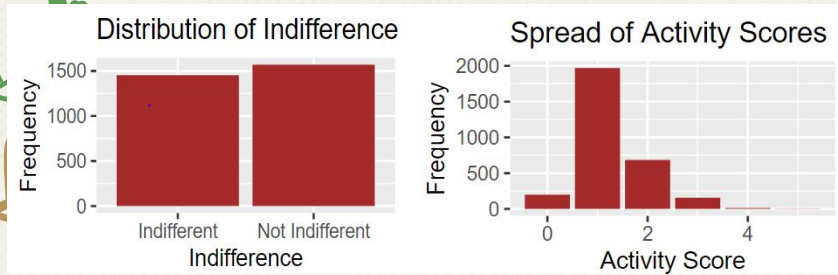
- **2018 Squirrel Census**, a project based on the sightings of squirrels in **Central Park, NYC**
    - 3023 observations 31 variables
- **Response:** Interactions with Humans (Approaches/Indifferent/Run Away)
- **Predictors:** Longitude and Latitude, Date, Age, Fur Color, Above Ground Sighter Measurement, Activities like running, chasing, climbing, eating, and foraging), Sounds like (Kuks, Quaas), Tail Flags/Tail Twitches

# *Intro to Data*

- **Activity score** (number of activities happening)
  - Distribution is unimodal and right skewed with median of 1
- Frequency of Indifferent vs. Not Indifference is approximately equal.
- Indifference/approach do not seem to depend on Activity Score (same distribution)
- No significant interaction effect between Kuks and Tail Flags

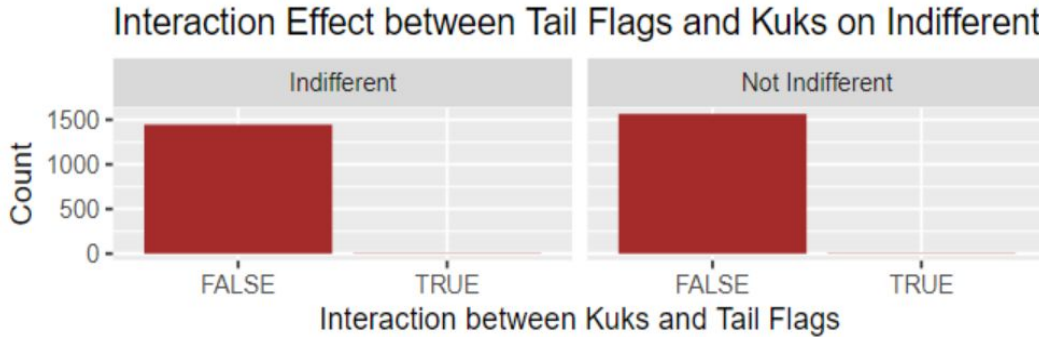






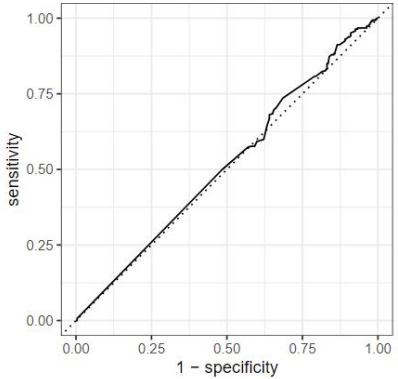


# *Final Model*

| term | estimate | std.error | statistic | p.value |
|---|---|---|---|---|
| (Intercept) | -0.249 | 0.219 | -1.136 | 0.256 |
| Above Ground Sighter Measurement | -0.011 | 0.005 | -2.381 | 0.017 |
| KuksTRUE | -0.576 | 0.261 | -2.208 | 0.027 |
| QuaasTRUE | -0.897 | 0.444 | -2.022 | 0.043 |
| MoansTRUE | -13.179 | 535.411 | -0.025 | 0.980 |
| Tail flagsTRUE | -0.055 | 0.191 | -0.290 | 0.772 |
| Tail twitchesTRUE | -0.011 | 0.119 | -0.090 | 0.929 |
| Primary Fur Color_Cinnamon | 0.132 | 0.246 | 0.536 | 0.592 |
| Primary Fur Color_Gray | 0.266 | 0.221 | 1.201 | 0.230 |
| QuaasTRUE_x_\Tail flags‘TRUE‘ | 14.813 | 233.410 | 0.063 | 0.949 |

- 3 Significant Predictors (Above Ground Sighter Measurement, KuksTRUE, QuaasTrue)
- Linearity issue with Above Ground Sighter Measurement

# *Interesting Findings from Model*




- AUC = 0.515
- Accuracy = 0.503
- Confusion Matrix:

| Prediction | Truth FALSE | TRUE |
|---|---|---|
| FALSE | 112 | 130 |
| TRUE | 155 | 177 |

- Both tail flags and tail twitches were not significant
  - Surprising

# *Conclusion and Future Work*

- **Indifference largely correlates with human activities**
  - Quaas (see threat) → significant
  - Other variables (normal activities) → not significant
- **Limitations**
  - Rigorousness of data collection
  - NA values
- **Future work: feature selection and engineering**
  - Better features: (Manhattan) distance from downtown?
  - Non-linear models