Reuniting Pets and Owners

with Machine Learning

Thomas Brown

The Data

- 80,000 Animal Outcomes at the Austin Animal Center:
- ~18,000 animals every year
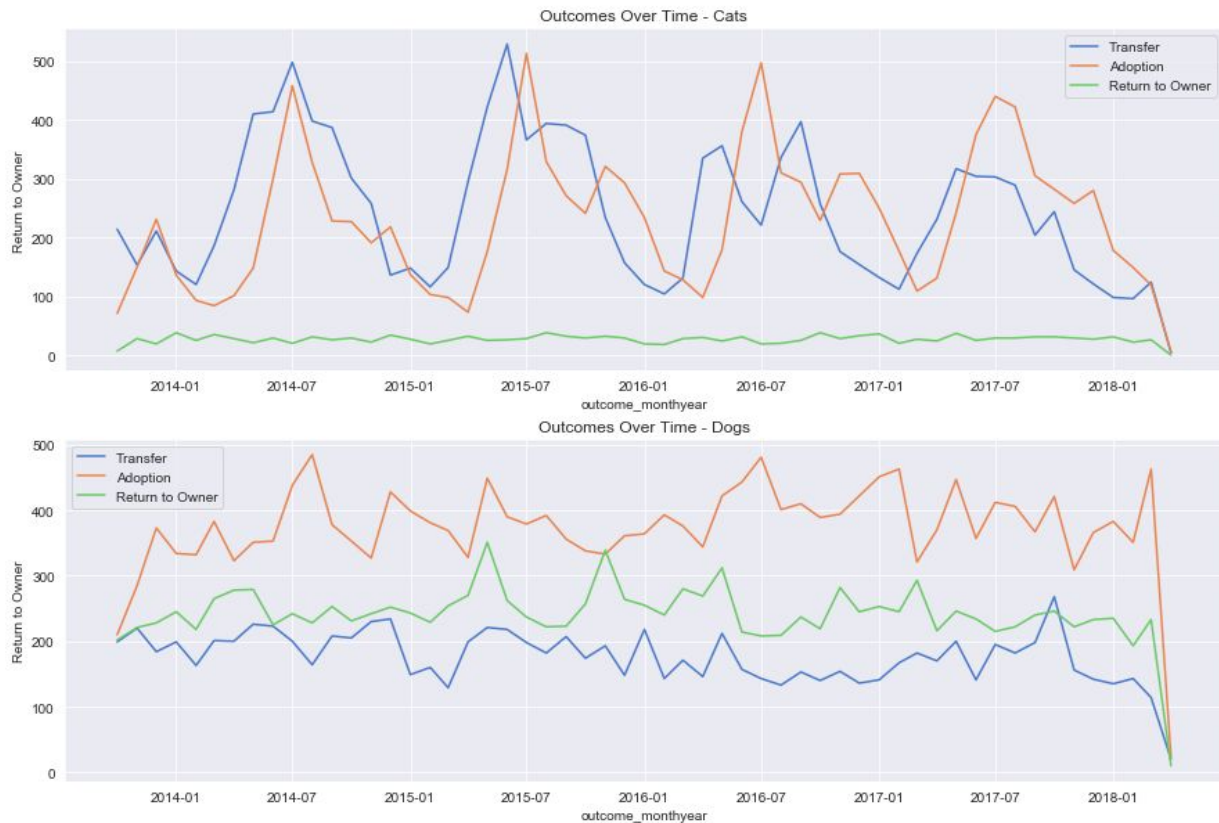- Largest No-Kill Shelter in the U.S.

AUSTIN ANIMAL CENTER

Home   About   Lost & Found   Animal Protection   Services/Resources   Donate   FAQ   Reports   Media   Partners

Welcome to the Austin Animal Center

Outcomes

- Kept:
  - Return to Owner
  - Adopt
  - Transfer
- Removed:
  - Euthanasia
  - Disposal
  - Missing
  - Died
  - Etc...

Outcomes Over Time - Cats
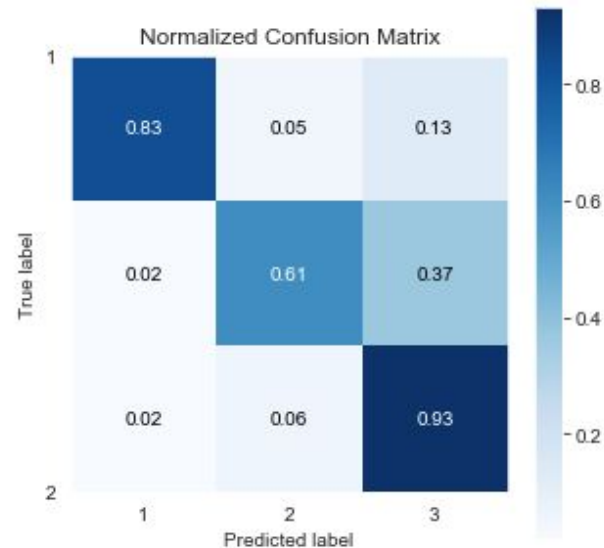
Outcomes Over Time - Dogs

The Model - XG Boost

Accuracy:

- Over 80% on ternary classification
- Excellent precision on 'Return to Owner'
- Excellent Recall on 'Adoption'
- 1 = Return to Owner
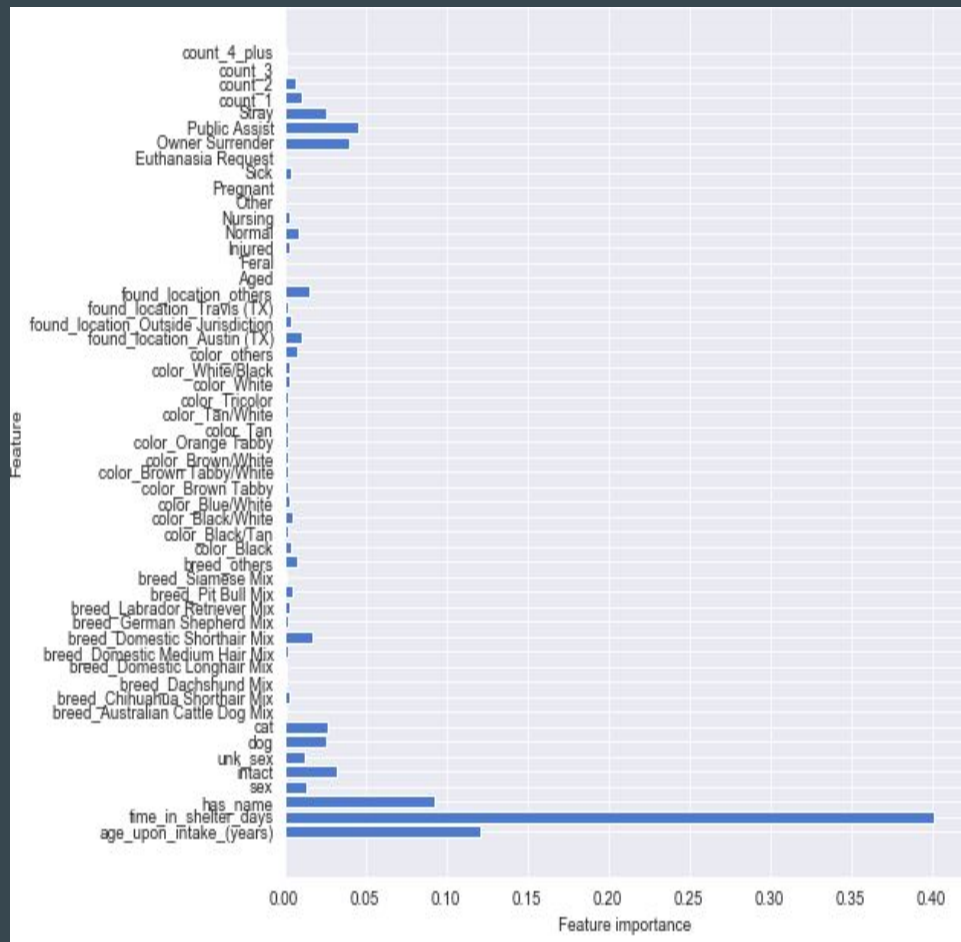- 2 = Transfer
- 3 = Adoption


```
Training data accuracy: 84.085%
Testing data accuracy: 80.425%
Return to Owner Precision: 92.03%
Return to Owner Recall: 82.57%
Adoption Precision: 75.08%
Adoption Recall: 92.8%
```

Normalized Confusion Matrix

Insights

Outcomes Vary By:

- Animal type
- Intake Type
- Intake Condition
- Number of Time in Shelter
- Breed
- Sex
- Name vs no-name
- Age
- And much more…

Conclusions

- We can take steps to reduce:
  - Number of clicks to find lost animals
  - Number of clicks to adopt animals
  - Time to transfer animals that won't be adopted or returned
- Sort animals for efficiency to get them out of the shelter as quickly as possible
- Better data collection can lead to a more accurate model!
  - Location
  - Breed
  - Weight
  - Health on intake
  - Etc...

Future Work:

- Headline on website to promote animals likely to be RTO
- Separate model for dogs vs cats
- More extensive modeling based on seasonality
- Web app to integrate the recommendation system

Thank You!

Special thanks to Flatiron, the Austin Animal Center, and the wonderful 052620 cohort

Please send questions or comments to thomaskbrown18@gmail.com

BONUS TREE!