

K.C. ANALYTICS:

Predicting significant injuries in car crashes

Our Team:



Kyle Lindstrom
CEO

[GitHub](#)

lindstromkap@gmail.com



Clay Hunn
COO

[GitHub](#)

hunnclay@gmail.com



AGENDA

1. Business Problem
2. Data Overview & Limitations
3. Metrics & Final Model
4. Conclusions & Recommendations
5. Insights



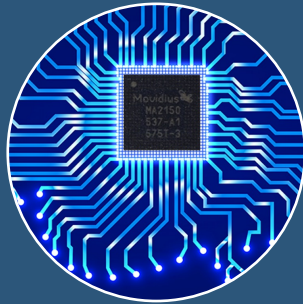
Implementation of an Emergency Response Device

Objective:



Increase safety
rating in new
vehicles

How:



Predict significant
injuries in crashes
w/ modeling

Benefits:

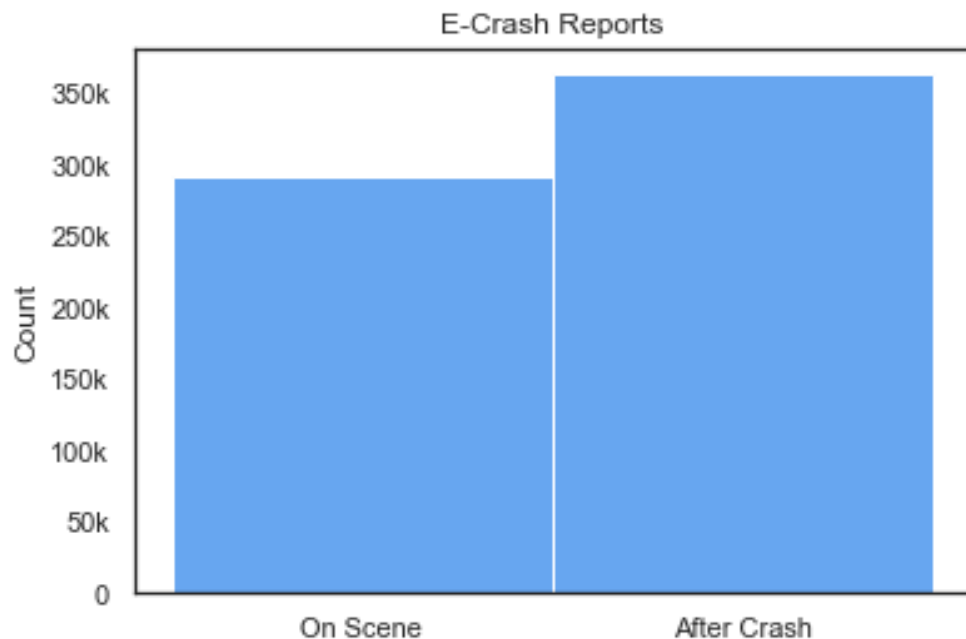


- Decrease emergency service response time
- Increase customer confidence

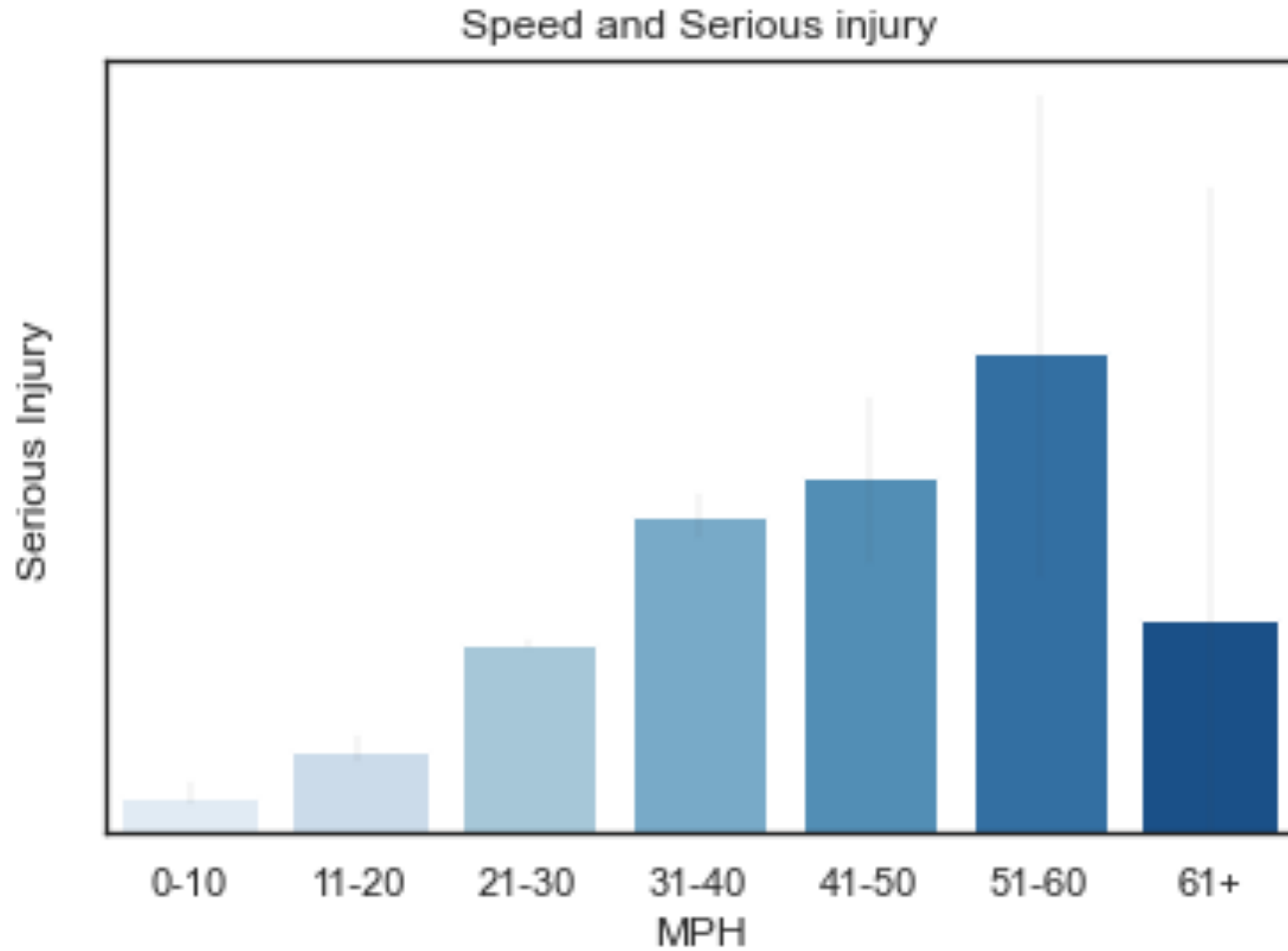


DATA OVERVIEW & LIMITATIONS:

- Data set: City of Chicago E-crash
- [Chicago Crashes](#)
- Time Range: 2017 to September 2022
- 580k unique crashes



SPEED AND SERIOUS INJURY



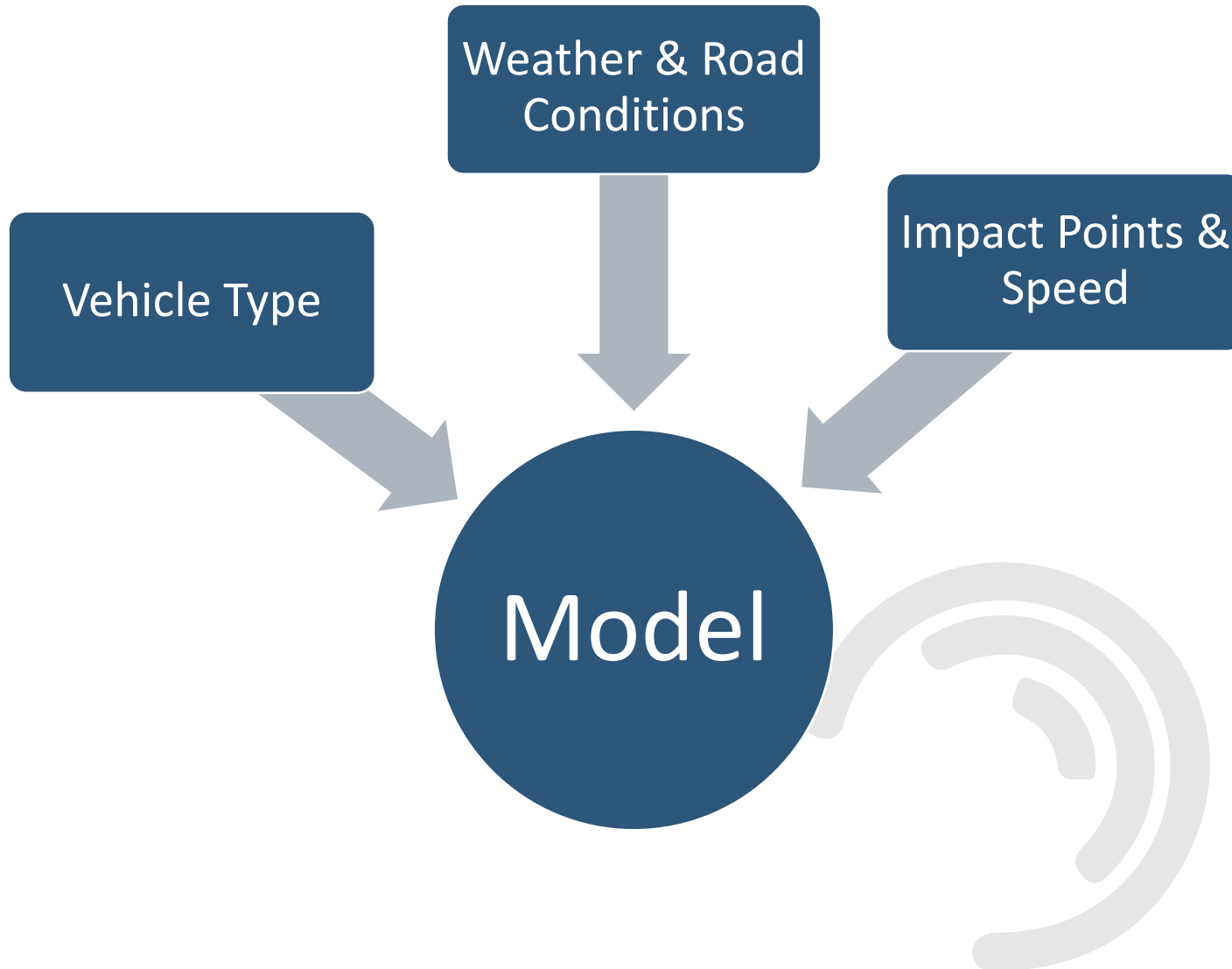
Footnote: The 61+ range only has 200 observations.

A futuristic robot with a white and grey metallic body stands in the foreground, its head tilted slightly. The background is a large, circular screen filled with various mathematical concepts, including:

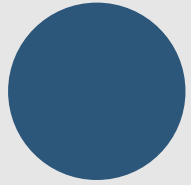
- Geometric diagrams: A 3D pyramid with vertices labeled A_x, A_y, A_z and a 2D coordinate system with axes C_x, C_y .
- Calculus and Limits: Formulas like $\lim_{n \rightarrow \infty} \sqrt[n]{A} = 1$, $\lim_{n \rightarrow \infty} \frac{n^2 - x}{3}$, and $\lim_{n \rightarrow \infty} \frac{1}{n}$.
- Set Theory and Functions: Notations such as $\{x_n\}$, $\{y_n\}$, $\{z_n\}$, and $f(x)$.
- Algebra: Equations like $x_n + y_n$, $x_n \leq y_n \leq z_n$, and $\frac{1}{1 + \frac{1}{n}}$.
- Trigonometry: $\cos 2n$ and \sin functions.
- Probability/Statistics: $\lim_{n \rightarrow \infty} \frac{1}{n}$ and $\lim_{n \rightarrow \infty} \frac{1}{n^2}$.

The robot's head features a large, circular, lens-like structure, and its arms are positioned in a thoughtful pose. The overall scene is set against a dark blue background with a grid-like pattern, suggesting a digital or virtual environment.

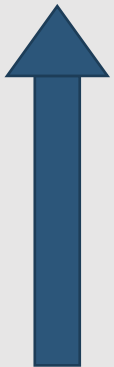
KEY FEATURES



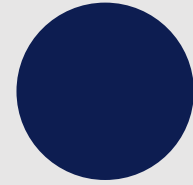
PERFORMANCE METRICS



RECALL



*We want to find the
optimal balance
between the two*



**FALSE POSITIVE
RATE**



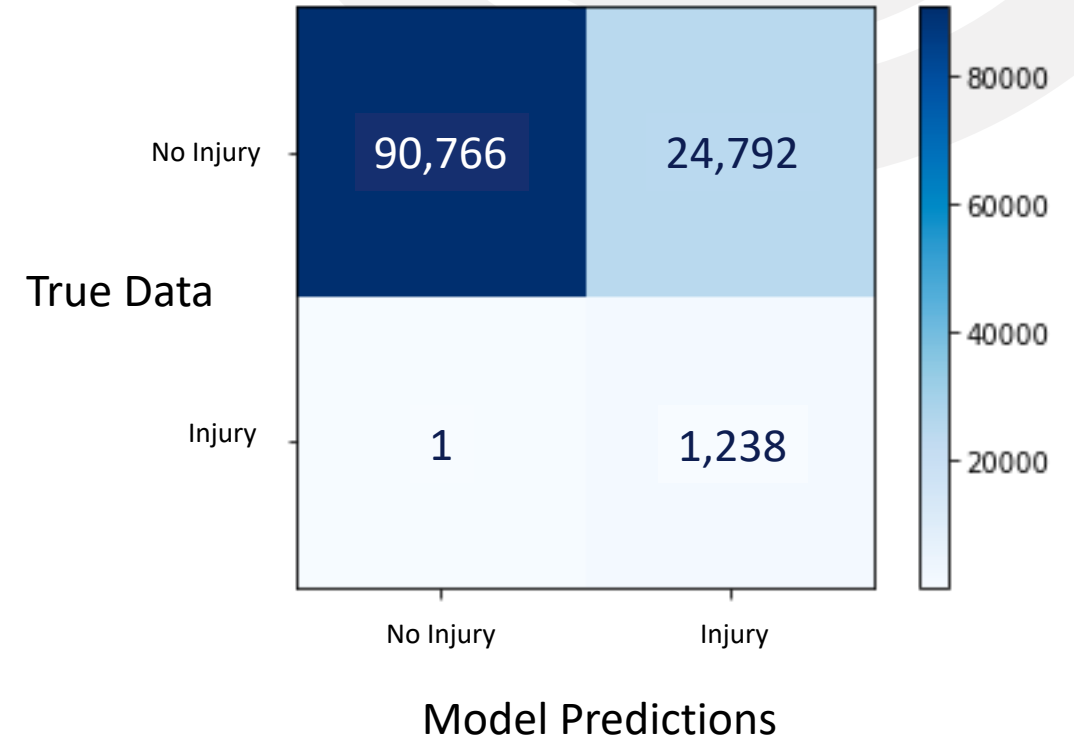
FINAL MODEL

99.9% Recall

- *EMS called for everyone who needs it*

21.5% False Positive Rate (FPR)

- *Only 1 in 5 people with no injury will be flagged*



CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS



This model has the optimal balance of Recall and FPR

It is fully capable of making the required predictions

Move forward with prototyping

Add an alert feature to address false positives



RECOMMENDATIONS

FUTURE INSIGHTS

- Explore additional features such as real-time velocity
- Ensure sure the model generalizes well to regions outside Chicago





THANK YOU!



Kyle Lindstrom



Clay Hunn