Preventing Adverse Police Interactions
Charlotte, NC

Station #1

The Bottom Line	This project uses data science to improve the police department's Early Intervention System (EIS) by figuring out which of Charlotte's 1,800 officers are likely to have an adverse interaction in the next two years.
Problem	Adverse events between police and the public, such as fatal shootings or racial profiling, can cause harm, erode police legitimacy, and lead to costly litigation. Evidence suggests these events can be prevented through targeted interventions.
Leadership	The White House Police Data Initiative is mobilizing 21 leading jurisdictions like Charlotte to take action on improving community policing. The Police Chief publicly endorsed the project and helped persuade the Charlotte city council to greenlight the project.
Staffing	Four data science fellows, one technical mentor, and one project manager staff this project at the University of Chicago. This team spent two full days conducting ride-alongs with officers and meeting with department leadership, Internal Affairs, and local subject-matter experts.
Data	Fellows used a comprehensive (but anonymized) dataset of interactions between police and the public (arrests, traffic stops, dispatches) tracking more than a decade of information. They also used data from Internal Affairs, field interviews, and contextual data about personnel, local crime, and demographics (location, the officer's shift, time of day) to detect the factors most indicative of adverse interactions. During ride-alongs, the team realized the challenge of capturing all the details and nuances of police-public interactions.
Technology	Charlotte's Police Department is heavily invested in a centralized Oracle data warehouse and custom EIS software. Data from multiple sources was aggregated in a PostgreSQL database and analyzed using Python.
Methodology	Charlotte's current EIS uses thresholds, such as 3 uses of force in 90 days, to flag officers for supervisor review. This project increases the accuracy by using algorithms with 300 predictors in their models to account for an officer's past behavior pattern and other contextual factors. For modeling, the team tried multiple approaches and machine learning techniques to optimize results and conduct model tuning.
Results	8% of officers end up having an adverse interaction in a given year. The most potent predictor was an officer's own history of adverse interactions. Using this and other indicators, the team's algorithm was better able than Charlotte's existing EIS system to predict trouble. They identified 12% more high-risk officers while flagging 32% fewer low-risk officers than the current system.

Replication	Officer participation is key and some consider this type of project an invasion of privacy, so ensure early buy-in. The project team also relied on Charlotte's definition of "adverse," which leaves the model open to the regurgitation of systemic biases if applied to data from other departments where there is less transparency about adverse interactions.
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