

Short Paper

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ABSTRACT

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1. INTRODUCTION

Almost every action leaves a digital trail. Digital evidence such as GPS records and payment transactions play an increasingly significant role in criminal and civil investigations[getsource?]. It is crucial that law enforcement agencies have the ability to utilize and transform the data into insightful information to aid in their investigations. The growth in volume and variety of digital data also increases the time and resources needed to analyze them. However, most law enforcement personnel do not have training in data science and digital research, which are generally required to perform advanced analytics. Without effective data analysis, investigators will struggle to find relevant information for their cases, even though data is everywhere.

Addressing this challenge, we designed and developed , a ___ dashboard to allow law enforcement agents to conduct investigative analysis of GPS and credit card data via an open-source tool. The tool aims to simplify data exploration and analysis to gain valuable insights into the behavior of individuals quickly. The study is built upon VAST Mini Challenge 2's task to find unusual patterns in GASTech employees credit card records and GPS tracking records of their cars. We demonstrate the potential of ___ through the use of interactive maps to explore GPS paths, interactive network graph to explore relationships from payment transactions, UPSet plot to understand co-location of individuals and one-way ANOVA to determine differences in spending behavior.

This paper documents our approach to design and develop the interactive application targeted at law enforcement agencies. This introduction is followed in Section 2 by an explanation of our objectives and motivation. Section 3 provides a review of existing techniques used to visualize GPS and

credit card data. Section 4 details the data used and design framework used. Section 5 provides a visual overview of the application. Section 6 summaries the findings from the use case. Section 7 concludes the report and offers ideas for further development.

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2. MOTIVATION AND OBJECTIVES

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3. REVIEW OF EXISTING TECHNIQUES

x

4. DATA AND USER INTERFACE DESIGN

x

5. THE APPLICATION

x

6. CASE STUDY: VAST MINI CHALLENGE 2

x

7. FUTURE WORK

We plan to improve the analytics-based tools so that the basic interactions such as brushing-and-linking and details-on-demand types can be easily supported.

References

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- [2] Meier, R. 2012. *Professinal Android 4 Application Development*. John Wiley & Sons, Inc.