Proceedings of the Informing Science + Information Technology Education Conference

An Official Publication of the Informing Science Institute
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July 20 – 28, 2025

PREDICTIVE MODELING FOR IDENTITY THEFT DETECTION: A DESIGN SCIENCE APPROACH USING MACHINE LEARNING AND HISTORICAL DATA

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ABSTRACT

Aim/Purpose	The proliferation of online banking has led to a significant increase in identity theft and cybercrimes, creating an urgent need to develop more effective predictive models to detect and prevent such fraudulent activities using advanced technological approaches.
Background	This study addresses the critical gap in the existing literature by exploring how historical identity theft victim data can be leveraged through supervised machine learning to create a comprehensive prediction model for identifying and preventing future identity theft incidents.
Methodology	A design science quantitative-focused research approach was employed, analyzing public records of identity theft victims in the United States from 2016. The study utilized a nonexperimental research design to compare and group data sets by number of victims and types of identity theft, applying an ontological research philosophy to examine the potential of supervised machine learning in prediction.
Contribution	The research contributes to the body of knowledge by demonstrating a novel approach to identity theft prevention through data-driven predictive modeling, bridging the gap between historical victim data and machine learning technologies.

The full paper has been published as the following and is being presented at this conference:

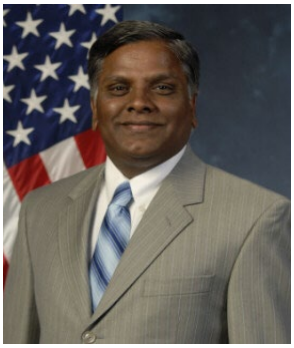
Mitchell, C., Jr., & Sambasivam, S. (2025). Predictive modeling for identity theft detection: A design science approach using machine learning and historical data. *Issues in Informing Science and Information Technology, 22,* Article 3. https://doi.org/10.28945/5506

Abstract published in *Proceedings of InSITE 2025: Informing Science and Information Technology Education Conference*, July 20-28, Article 5. Informing Science Institute. https://doi.org/10.28945/5528

Findings	The study confirmed that supervised machine learning can be effectively used to create an identity theft prediction model using historical victim data, providing insights into potential detection and prevention strategies for cybercrime.
Recommendations for Practitioners	(1) Implement advanced machine learning models for early identity theft detection. (2) Develop comprehensive data collection strategies for historical victim information. (3) Integrate predictive analytics into existing fraud prevention systems.
Recommendations for Researchers	(1) Expand the dataset to include more recent and diverse identity theft incidents. (2) Develop more sophisticated machine learning algorithms. (3) Investigate cross-border identity theft patterns. (4) Explore the integration of multiple data sources for improved prediction accuracy.
Impact on Society	The research offers a potential breakthrough in combating identity theft, potentially reducing financial losses, protecting individual privacy, and enhancing overall cybersecurity for online banking and financial transactions.
Future Research	(1) Developing real-time prediction models. (2) Exploring artificial intelligence techniques for more dynamic fraud detection. (3) Investigating the psychological and social factors contributing to identity theft.
Keywords	historical financial transactions, big data, machine learning, fraud detection, identity theft

AUTHORS

Dr Charles D. Mitchell Jr is a seasoned IT professional and educator with extensive experience in information technology management and cybersecurity. He holds a PhD and serves as an adjunct professor, sharing his expertise in IT security, identity theft prevention, and data protection. With a background that spans both academic research and practical industry applications, Dr Mitchell has developed specialized knowledge in supervised machine learning for fraud detection and identity theft prediction. His work focuses on leveraging historical data to create models that can help protect individuals and organizations from digital threats. Dr Mitchell is passionate about advancing cybersecurity education and developing innovative solutions to address emerging challenges in information security.



Dr Samuel Sambasivam is the Chair and Professor of **Computer Science Data Analytics** at **Woodbury University**, Burbank, CA. He is also **Chair Emeritus and Professor Emeritus of Computer Science** at **Azusa Pacific University**. Additionally, he served as a **Distinguished Visiting Professor of Computer Science** at the **United States Air Force Academy** in Colorado Springs, Colorado, for two years.

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