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## Identifying the signs of fraudulent accounts using data mining techniques

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## ABSTRACT

In today's technological society there are various new means to commit fraud due to the advancement of media and communication networks. One typical fraud is the ATM phone scams. The commonality of ATM phone scams is basically to attract victims to use financial institutions or ATMs to transfer their money into fraudulent accounts. Regardless of the types of fraud used, fraudsters can only collect victims' money through fraudulent accounts. Therefore, it is very important to identify the signs of such fraudulent accounts and to detect fraudulent accounts based on these signs, in order to reduce victims' losses. This study applied Bayesian Classification and Association Rule to identify the signs of fraudulent accounts and the patterns of fraudulent transactions. Detection rules were developed based on the identified signs and applied to the design of a fraudulent account detection system. Empirical verification supported that this fraudulent account detection system can successfully identify fraudulent accounts in early stages and is able to provide reference for financial institutions.

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## 1. Introduction

As the improvement of modern civilization and technology has brought many new benefits to the society, it has also resulted in a transition of social values towards utilitarianism. This, in turn, leads to some people's chasing of increased wealth through fraudulent activities.

With the recent advancement of media and communication networks, many techniques to commit fraud have been developed, resulting in various new ways of fraud (Phua, Leem, Smith, & Gayler, 2010). ATM phone scams are one well-known type of fraud. Fraudsters use various scams to deceive and attract victims to transfer their money into fraudulent accounts<sup>3</sup> through the use of financial institutions or ATMs. There are many different types of scams, including lottery, tax refund, web shopping, kidnapping, fiduciary loan, and health insurance refund. Fraudsters use telecommunications technology to make scam calls from foreign regions, or use stolen identities (IDs) to apply for local phone numbers, in order to conceal their true identities and locations from the law enforcement. In addition, fraudsters need to use stolen IDs to apply for fraudulent accounts to receive money transfers from victims.

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<sup>3</sup> A fraudulent account is a dummy bank account used for the purpose of fraud.

The government in Taiwan has realized the severity of these fraud crimes and took necessary procedures to stop frauds. According to the statistics announced by the National Police Agency (2011)<sup>4</sup>, there were 28,820 cases of committed frauds, among which, telephone frauds took the largest portion (30.7%) with 8842 cases. Although the annual number of committed ATM phone scams was declining (National Police Agency, 2011), ATM phone scams remain harmful to victims and the entire society. As most ATM phone scams collect money from victims through fraudulent accounts, it is important for financial institutes to detect and identify fraudulent accounts to remove the tools from fraudsters.

There have been limited numbers of literatures related to ATM transfer fraud. The focuses of these prior researches include (1) statistical analysis related to fraud activities (Brentnall, Crowder, & Hand, 2008; Sudjianto et al., 2010); (2) process and technique analysis of fraud activities (Ku & Liao, 2007; Titus & Cover, 2001); (3) legal analysis of frauds (Hayhoe, 1995; White, 2008). This study intended to apply data mining techniques to assist the selected bank in identifying signs of fraudulent accounts from the vast transaction detail database and to detect fraudulent accounts based on these signs. The purpose of this study is to present new reference materials to detect fraudulent accounts in order to develop strategies for detecting and preventing future frauds.

Based on the motives above, this study has the following objectives:

<sup>4</sup> National Police Agency, Ministry of the Interior, Executive Yuan, ROC.



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مطالعه ای بر:

### تشخیص حساب های بانکی جعلی با استفاده از تکنیک های داده کاوی

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#### چکیده

در جوامع فناورانه امروزی، با توجه به پیشرفت هایی که در حوزه ی رسانه و شبکه های ارتباطی صورت گرفته است، ابزارهای جدیدی و مختلفی به منظور انجام فعالیت های جعلی نیز پدید آمده است. یکی از روش های رایج جعل، کلاه برداری از طریق تلفن ATM می باشد. سطح رواج کلاه برداری های تلفنی ATM به دلیل جذب قربانیان در جهت استفاده از مؤسسات مالی و یا ATM<sup>۱</sup> برای انتقال پول خود به حساب های جعلی می باشد. صرف نظر از نوع جعلی که بکار گرفته می شود، جاعلان فقط از طریق حساب های جعلی قادر به جمع آوری پول قربانیان می باشند. بنابراین ضروری است تا بتوان نشانه های حساب های جعلی را تشخیص داده و بر مبنای این نشانه ها بتوان خود حساب های جعلی را نیز تشخیص داد تا بتوان میزان خسارات ناشی از آن را کاهش داد.

در این مطالعه قصد داریم از قاعده ی انجمنی<sup>۲</sup> و روش دسته بندی بایسان برای تشخیص نشانه های حساب های جعلی و الگوهای تراکنش های جعلی استفاده کنیم. قواعد تشخیصی که بکار گرفته خواهد شد، بر مبنای نشانه های تشخیص توسعه یافته اند و به منظور طراحی سیستم تشخیص حساب جعلی بکار گرفته شده اند. بررسی های تجربی نشان داده است که این سیستم تشخیص حساب جعلی می تواند به طور موفقیت آمیزی حساب های جعلی را در گام های اولیه ی آن تشخیص داده و می تواند رفرنسی را به مؤسسات مالی نیز فراهم سازد.

**واژگان کلیدی:** تشخیص جعل، داده کاوی، حساب موقت، حساب جعلی، کلاه برداری تلفنی ATM

<sup>۱</sup> Automatic teller machine

<sup>۲</sup> Association rule