의사 결정 방법론을 기반한 암호화 알고리즘 선호도 분석

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Analysis of Preference for Encryption Algorithm Based on Decision Methodology

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요 약

최근 스마트폰 잠금 해제 방법으로 암호화 기술을 사용하여 다양한 알고리즘이 채택하고 있다. 이미 상용화에 성공한 인간의 생체인식 기술로 해결하는 방향으로 나아가고 있다. 이러한 방법에는 지문인식, 얼굴인식 및 홍채인식 등이 포함한다. 본 연구에서는 이미 상용화된 생체인식 기술 및 패턴인식 및 암호입력 방법을 평가항목으로 선정 하였다. 평가항목은 지문인식, 얼굴인식 홍채인식, 패턴인식 및 암호 입력방법 등 다섯 가지 알고리즘으로 구성되어 있다. 이러한 알고리즘을 기반으로 계층적 분석 방법론을 바탕으로 스마트폰 사용자의 암호화 알고리즘 선호도를 분석하였다. 또한 분석결과를 바탕으로 이론적 시사점을 제시하였다.

ABSTRACT

Lately, variety of algorithms using encryption technology has been adopted as methods of unlocking smartphone. It is advancing toward the direction to solve through human biometrics technology which has already succeeded in commercialization. These include finger print recognition, face recognition, and iris recognition. In this study, we selected biometrics recognition technology and pattern recognition and password input methods which are already commercialized as evaluation items. The evaluation items are five algorithms including finger print recognition, face recognition iris recognition, pattern recognition and password input method. Based on these algorithms, analytic hierarchy process is used to analyze the preference of smartphone users. Also, the theoretical implications are presented based on the analysis results.

키워드

Decision support, Encryption technology, Preference, Smartphone

Ⅰ. INTRODUCTION

Lately, smartphone is becoming a marketplace for experimenting with new innovative technology items based on ICT (information communication technology). Smartphone is based on universality, using mobile phones anytime and anywhere, including mobile phone unique features and personal computer connection, various apps such as Internet, mobile banking, navigation, digital camera, games, music and movie watching We are leading innovative technology by converting into smart devices that provide useful functions. Various functions of the smartphone bring convenience and usefulness of life to smartphone users, and it is judged that the use of smart devices facilitates acquisition of knowledge and provides convenience and pleasure in life [1]. However, such convenience

and usefulness are exposed to the risk of personal privacy and personal information a lost. To overcome these risks, technologies for unlocking smartphone has been developed using various encryption techniques. Thus, various encryption methods also provide the user with inconvenience.

With this solution, the related technology is progressing rapidly in order to solve the unlocking method of the smartphone through human biometrics. This includes technologies using fingerprint recognition, face recognition, and iris recognition. In the traditional industry or information communication technology industry, when new technologies appear in the market, companies in the industry often see their products, services, and technologies compete intensely in order to dominate the market. And, competition for technical standards, especially in the information communication technology industry, is of strategic importance for companies involved in the competition. The result of such competition appears to be a form of dominant design that is fact standard rather than an official standard in the industry. In addition, it can connect and exchange data based on various wired and wireless communication such as a laptop, and it is said that the openness of the app is the most distinctive characteristic of the existing mobile phone [1].

II. RESEARCH METHODOLOGY

The analytic hirerarchy process is a kind of multi decision tool developed by Saaty (2008). The lack of information on decision making and the measurement of qualitative or intangible, quantitative, or tangible criteria using percentage scales, it is a decision analysis process that resolves a large problem into small elements and resolves the relative importance, possibility, and preference of each layer element by numerical conversion by simple pair comparison [3]. The first use has been extensively used by many countries, governments, institutions and individuals, including those used in relation to the reduction of nuclear weapons between the United States and Russia [4]. Prioritization evaluation methods include hierarchical analysis technique, rating method, Delphi method and ranking method. The difference between the hierarchical analyzer method and the existing evaluation method is as follows. In the existing evaluation method, the absolute score system has a limitation in maintaining objectivity in the evaluation, and reliability of the evaluation result should depend only on expert opinions. In addition, there is a possibility of distortion depending on the conversion factor and the evaluation method, and the understanding of each factor in evaluation varies from person to person. However, the AHP technique is accurate by deriving the evaluation results through dual comparative evaluation and linear algebra. In addition, we test the reliability through consistency ratios, solve the sensitivity part by applying comparative scale re-evaluation, pair comparison, and linear algebra, and solve the independence problem through hierarchy [3,4]. A major advantage of AHP is that it can be used to calculate preferences in a small number of respondents in a scientific way.

III. ANALYSIS AND CONCLUSION

This study derives ten evaluation attributes from the previous research through expert recommendation for smartphone unlock preference analysis. Among the derived attributes, we adopted the five most commonly used attributes except those that can't be used as evaluation attributes. Based on this, it was derived as final stage evaluation attribute as shown in Figure 1. There are 5 methods of inputting face recognition + password, fingerprint + password, pattern recognition + password, iris recognition + password, and password or pin number. Therefore, the hierarchical comparison attribute for the smartphone unlocking algorithm has been completed for applying the AHP technique.

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