

Use of Face Authentication Systems Associated with the “My Number Card”

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Abstract

The “My Number Card” is the IC card delivered by Japanese local governments to applicants in accordance with the “Act on the Use of Numbers to Identify a Specific Individual in Administrative Procedures”. The “My Number Card” carries the face photo data on the front side and inside is the IC chip for use in various operations. This paper outlines NEC’s “Face Recognition System for use at the My Number Card Delivery Counters” that is used at the time of the card delivery. Experiments demonstrating the utilization of the card’s face photo data are also introduced.



Digital government, My Number, My Number Card, personal identification, face recognition, public-private data linkage

1. Introduction

NEC supplies the “Face Recognition System to the Japan Agency for Local Authority Information Systems (J-LIS) for the My Number Card Delivery Counter” for use in personal identification at the social security and tax number system card (“My Number Card”) delivery counters of local governments.

The IC chip inside the “My Number Card” stores the data of the face photo on the card for use in digital processing.

This paper is intended to give an outline of the “Face Recognition System for use at My Number Card Delivery Counters” and an introduction of demonstration experiments of utilization of the card’s face photo data.

2. Face Recognition System for My Number Card Delivery Counters

2.1 Background

According to the Act on the Use of Numbers to Identify a Specific Individual in Administrative Procedures (hereinafter called the “My Number Act”), a paper sheet showing the My Number is sent by mail to every resident

registered in local governmental residence certificates since October 2015. A resident who wants the “My Number Card” can receive it from the local government by filling in the enclosed My Number Card Application Form and attaching a face photograph to it.

Since crimes based on falsification and alteration of ID certificates have recently become a social issue, local governments are required to perform robust personal identification at the delivery of the “My Number Card”, which is expected to be used under various scenarios including both public and private occasions. Under these circumstances, the face recognition system provided by NEC supports the prevention of impersonation at the time of a “My Number Card” being delivered by local governments.

2.2 Outline of Face Recognition System for My Number Card Delivery Counters

The system reads the face photo on the My Number Card (in a case when a person visits the agency at the time of delivery) or on the My Number Card Application Form (in a case when the person visits the agency at

the time of application) with a scanner. The read data is matched with that of the visitor shot with a camera and the similarity figure is displayed on the screen. The officer uses the value as the reference for the decision of delivery by comparing it with the criteria set by each local government dept.

The work to be done by the local government is as follows: First, prepare and connect a computer, web camera and scanner, and install the "Face Recognition System for My Number Card Delivery Counter applications". Now the preparation work is complete.

Next, in order to use the system, the application must be booted by pressing the Face Recognition System for

the My Number Card Delivery Counter icon on the computer screen and set the My Number Card or My Number Card Application Form on the scanner (**Fig. 1**).

Take a shot of the visitor with the web camera and press the "Start Matching" button of the application. The scanner is activated and matching between the face photo read from the card by the scanner and that of the visitor shot by the web camera starts (**Fig. 2**). This ensures the delivery of the My Number Card carrying the face photo of the visiting resident to the resident.

The face information is not stored in the system so safety against personal information leaks is secured.

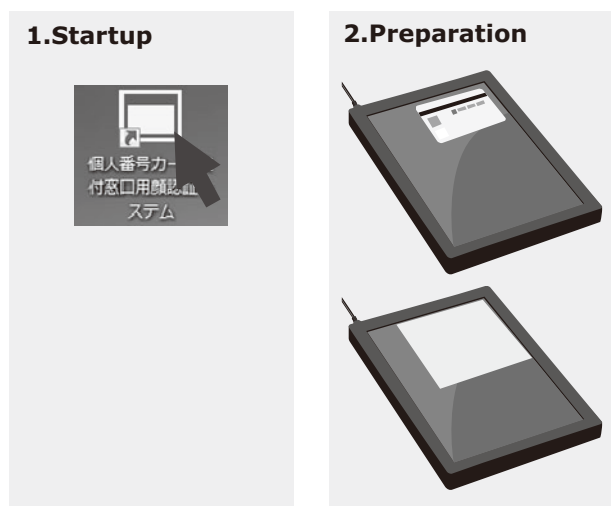


Fig. 1 Illustration of startup and preparation.

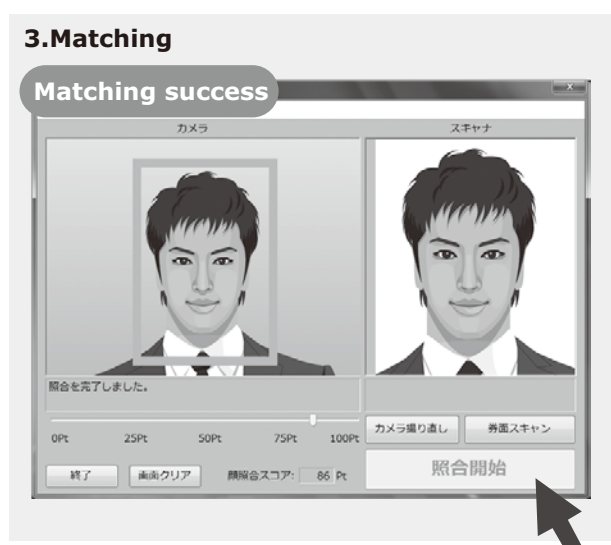


Fig. 2 Illustration of matching.

3. Demonstration Experiments Using the My Number Card and Face Recognition Systems

3.1 About the My Number Card

The My Number Card is the IC card delivered by Japanese local governments to the applicant in accordance with the My Number Act. Although a 12-digit individual number (hereinafter My Number) is printed and stored on/in the My Number Card, the demonstration experiments introduced here do not use the My Number because it is a specified personal information the range of usage of which is restricted by the My Number Act.

The My Number Card has the following four main features.

- (1) It is delivered upon personal identification at a counter of the local government (the card is delivered definitely to the said person).
- (2) It includes the electronic certificates of the Public Key Infrastructure (PKI) that can be used by governmental agencies and enterprises.
- (3) It is based on the residence certificate so that the true name and address are written on the card and also stored in the IC chip.
- (4) It is delivered free of charge for the moment.

The IC chip inside the My Number Card has a form as shown in **Fig. 3** below.

The "front-side APP" saves the data of the face photo on the card surface for use by either the governmental or private sectors. The fact that strict personal identification is performed by the local government at the time of delivery means that the face photo data is formally guaranteed. As its usage is subject to no restriction, it can be the optimum means for the initial registration of the face image information in face recognition systems. Similar face photo information is also stored in the IC chip inside the driver's license. Therefore, if the driver's license and My Number Card are used in the initial registration for the face recognition systems, the system

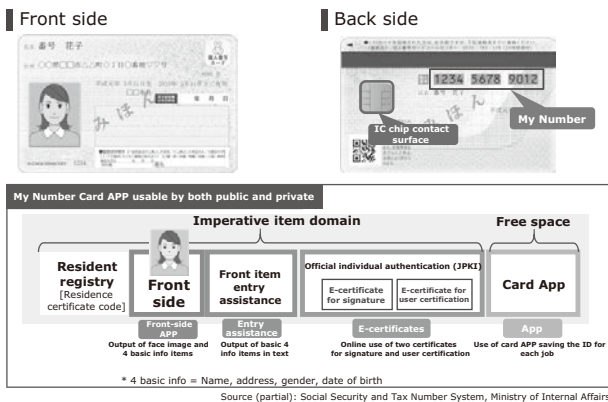


Fig. 3 Range of My Number Card use.

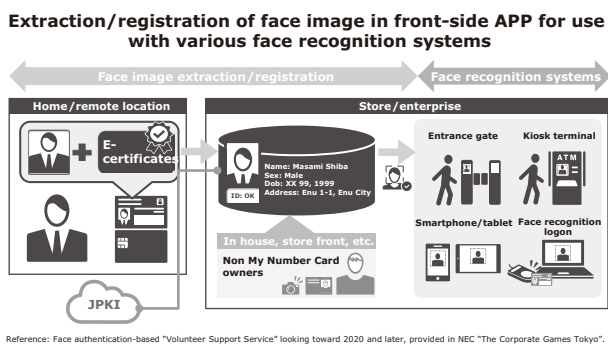


Fig. 4 Usage in various face recognition systems.

allows the My Number Card (about 17 million owners) to cover more residents. These will include 82 million driver's license owners, as well as the aged persons who have surrendered their driver's licenses and younger persons who have not yet obtained a driver's license.

In addition, as the My Number Card stores the electronic certificates of the Japanese Public Key Infrastructure for personal identification, adding the e-signature to the face photo data makes the card compatible with remote face photo registration accompanied by personal identification. For example, it would be possible to complete user registration via a smartphone at home by sending user's face photo data. This makes it possible that a user can go through the face authentication gate of the shop without showing any ID card, etc. and also carry out face-authentication payment (Fig. 4).

3.2 Demonstration experiments

In 2017 and 2018, NEC conducted a series of three demonstration experiments using the face photo data in the IC chip of the My Number Card (Fig. 5).

Demonstration of face photo data use in My Number Cards

June 11, 2017	Chichibunomiya Minato Rugby Festival 2017	Face authentication entrances of volunteers
Nov. 3 to 4, 2017	The Corporate Games Tokyo 2017	Face authentication entrances of volunteers
Mar. 6 to 9, 2018	Retail Tec JAPAN 2018	Demonstration of face authentication solutions



<Issue> Cases, though rare, in which the face information is of low quality (about 2%). Example: Eyes covered by hair.

Fig. 5 Outline of the demonstration experiments.

The first of these was the face-authentication entrance of volunteers at the "Chichibunomiya Rugby Festival 2017" held on June 11, 2017. At the volunteer registration procedure in advance, the My Number Card owners registered their face photo data in the IC chips and the non-owners had their photos taken. On the day of the event, the face recognition system performed the personal identification, issued the instruction documents for volunteers and delivered the uniforms at the entrance acceptance gate.

The second experiment was at "The Corporate Games Tokyo" held on November 3, 2017. In the same way as in the first experiment, the volunteers were accepted based on their face authentication.

The third experiment consisted of linkages with various face authentication solutions at the NEC Group booth of Retail Tech Japan held on March 6 to 9, 2018. Specifically, when visitors try various face information systems, they are asked to register themselves to the exhibition booth. At this time, My Number Card owners have registered their face photo data using their cards.

The results of these demonstration experiments indicated that the face photo data in the IC chips of the My Number Cards may be basically usable with face recognition systems. Nevertheless, it was also found that the face photo data was unusable with face recognition systems in about 2% of the cases. These occurred when the hair in the face photo covered the person's eyes. NEC reported details of this issue to the Liberal Democratic Party members as well as governmental officers at the Special Mission Committee on IT Strategy, LDP.

3.3 Towards further promotion of use

Since the My Number Card enables rigorous personal identification online, it is planned to be applied as the personal identification means for public/private data link-

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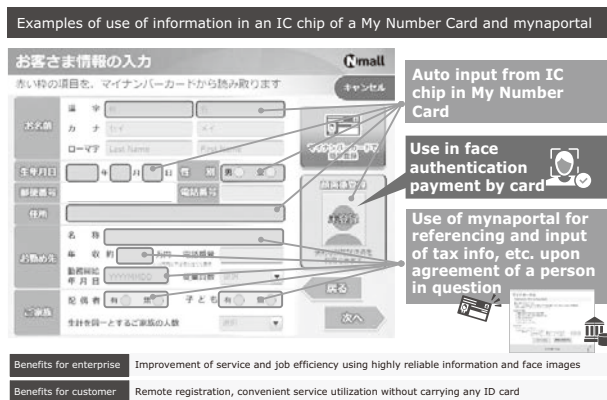


Fig. 6 Illustration of a credit card application window.

age of the API linkages of personal information possessed by national and local governments. Specifically, after the authentications of a corporate site and a mynaportal* are linked, it will be possible to provide personal information such as income data to the corporate side upon agreement from the person in question. As the use of the My Number Card is indispensable in this case, the use of the API linkage may be accelerated by also registering the face photo data in the face recognition system. For example, in the future, a credit card may be applied online by entering the name, address, sex, date of birth and face photo data automatically from the IC chip in the My Number Card and entering the income and household information with the API linkage with a mynaportal. Subsequently a credit settlement will be possible without using the card by using the face recognition system (Fig. 6).

Up to the present, the credit card applicant should fill in the form with the required items and mail it together with a copy of the ID document and could then receive the card by mail after the approval. But all of these operations will be able to be completed online. This will be one of the real benefits of digital transformation (DX) based on public/private linkage and on digital enterprise government.

As seen above, the authors firmly believe that, in the future, the face recognition system, when it is linked with the My Number Card, can be positioned as a core solution for digital government and public/private linkage as being promoted currently by administrations.

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* mynaportal: a government-owned online Web service that allows you to check how your information contained in your My Number is shared on your personal portal site.

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