Facial Recognition Solution for Offices — Improved Security, Increased Convenience

SAIKI Makoto, HIRAO Koichiro, OBAYASHI Nagatoshi, MIYAKE Takashi, LI Shanshan

Abstract

Office security is widely regarded as one of the most important issues facing businesses today. While traditional lock and key security has not been abandoned, a wide range of authentication methods are now being used in the modern workplace, including key fobs, ID cards, and passwords. Unfortunately, these enhanced security systems tend to inconvenience users, and can often be confusing and complicated, as well as leading to more complex management and administration. Further complicating the situation is the threat posed by theft and use of other people's ID cards and passwords. NEC's Facial Recognition Solution for Offices offers a comprehensive suite of facial recognition products and services that allows companies to achieve a secure and convenient office environment by standardizing intra-office authentication with facial recognition.

Keywords
facial recognition, biometrics, NeoFace, room entrance/exit, building entrance/exit, smart lock, log-on, single sign-on (SSO), printing, secure printing

1. Introduction

As the name implies, the Facial Recognition Solution for Offices is designed to enhance intra-office security and improve intra-office convenience by linking a suite of products that incorporate NeoFace — NEC's facial recognition AI engine. The core of NEC's Bio-IDiom biometric brand, NeoFace boasts the world's number-one authentication precision[1)].

Most companies today view office security as one of their top issues and are taking steps to introduce a variety of authentication methods. As security systems become more complex and multi-layered, employees find themselves forced to use multiple authentication means. For example, it is necessary to set different IDs and passwords for different task systems and renew IDs and passwords periodically. In many cases, different ID cards are required for different applications. When an ID card is lost, it becomes invalid and may take some time to replace. The end result is that office security becomes so much of a burden that users and administrators are tempted to avoid it altogether.

Designed specifically for office use, NEC's security solution simplifies authentication and maximizes convenience. Built around the NeoFace Facial Information Management Service which allows you to use facial data, the Facial Recognition Solution exclusively for Offices incorporates NEC's comprehensive suite of facial recognition products and services including the NeoFace Monitor for PC security, NeoFace Access Control which unlocks security gates at entry/exit points, and the NeoFace Facial Recognition System Introduction Package which allows companies to easily introduce a facial recognition system. The system is easy to install and can be up and running almost immediately, reducing the burden on both users and administrators by replacing multiple authentication methods with facial recognition (**Fig. 1**).

2. Products and Services Included in the Facial Recognition Solutions for Offices

2.1 NeoFace Access Control

This product is an integrated facial recognition terminal that packages the software and hardware you need for facial recognition such as a face database, camera,

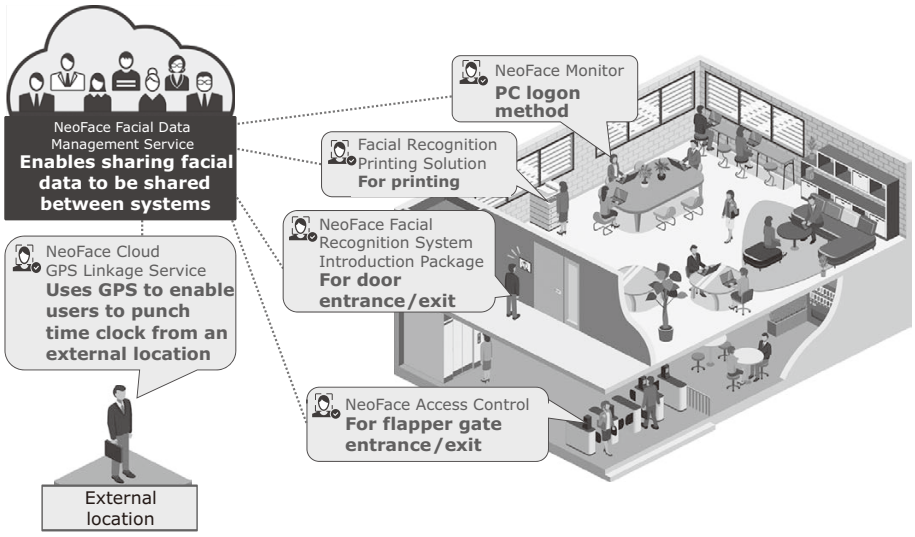

Fig. 1 Outline of Facial Recognition Solution for Offices.

Photo 1 Entrance control with NeoFace Access Control installed.

and display panel in addition to a facial recognition engine. It detects faces from face photos registered in the database incorporated in the terminal in advance, as well as from video data captured with the built-in camera. Authentication is performed instantaneously.

With this product installed at your office's security gate, you can use facial recognition to unlock the security gate, making possible hands-free entry/exit authentication. As it is also compatible with dual-factor authentication, it can help prevent illicit entry and exit using a stolen ID card or another person's ID card. The result is significantly enhanced security.

Moreover, since employees can be authenticated without having to stand still in front of the camera, they can come and go without delay, ensuring smooth, continuous traffic flow even at busy times of day when workers are arriving to or leaving work (**Photo 1**).

2.2 NeoFace Facial Recognition System Introduction Package

This product is a package of services designed to facilitate construction of a system centered on a server preinstalled with facial recognition software together with post-purchase maintenance services. It can also be used for confirmation of arrival of VIP clients, for instance, in addition to entry/exit control and employee authentication.

NeoFace is compatible with facial recognition using not only an IP camera, but also using a Windows tablet, making it possible to set up a very simple and cost-effective entry/exit control system. Since users can authenticate themselves by confirming their faces on the tablet, user convenience is greatly enhanced. As this product is compatible with thumb-turn locks which are commonly used in offices, as well as electric locks, it can be easily integrated with most doors without modification. This product is also provided with a smart lock system called the Akerun facial recognition model (manufactured by Photosynth) which can be mounted on a thumb-turn lock door (**Fig. 2**). The provision of the Akerun enables automatic unlocking of the door with facial recognition.

In addition, this product features multiple interfaces, so it can be linked with other systems. For example, by linking facial recognition entry/exit data with an attendance/absence management system, you can effectively track your employees' working hours by checking devia-

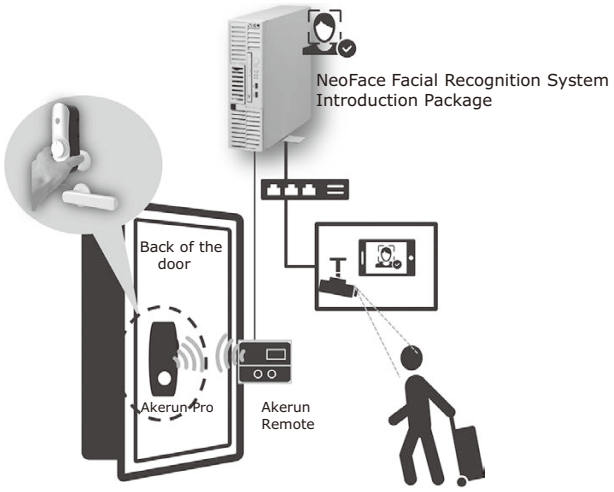

Fig. 2 Configuration of the Akerun facial recognition model.

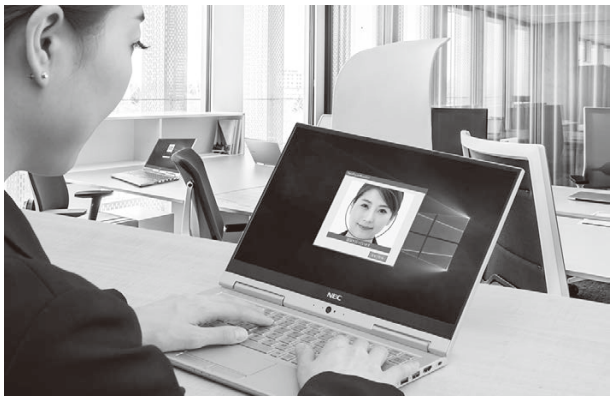

Photo 2 PC login screen.

tions between entry time and exit time. This product can be utilized in many other applications, as well.

2.3 NeoFace Monitor

This product uses facial recognition to enable users to log onto a PC (Windows OS), unlock the OS, and log into task applications.

Users no longer need to enter hard-to-remember passwords every time they use a PC or PC application. At the same time, administrators can easily track who used which PC by referring to face data logs. This allows them to confirm that users were legitimate users and to avoid illicit use. In other words, using facial recognition enhances security, while eliminating the hassles of conventional log-in methods.

To prevent spoofing, NeoFace Monitor incorporates a movement detection function that checks for facial movement to distinguish a human face from a photograph or video image. This system is also compatible with dual-factor authentication that combines password/ID card confirmation and facial recognition. To enhance security when a user is logged on and the lock is unlocked, NeoFace Monitor is also equipped with a continuous surveillance function that periodically performs facial recognition during use and automatically activates the lock when necessary (**Photo 2**).

2.4 Facial Recognition Printing Solution

This solution uses facial recognition to facilitate user identification, something previously handled with ID cards. A network camera installed near the printer captures the face of any user who requests printing and then, upon successful authentication, the printer executes the requested print job. Using facial recognition technology enables printing systems to be secured with hands-free authentication, eliminating the need to scan ID cards and enhancing security by preventing users from abandoning printouts near the printer or taking other people's printouts by mistake.

As a product, our solution has been achieved by linking NEC's NeoFace facial recognition engine with CEC's secure printing solution called "SmartSESAME SecurePrint!". In addition to the security features made possible by facial recognition, this solution also offers multi-vendor printer compatibility, location-free printing, and printing log acquisition.

2.5 NeoFace Cloud GPS Linkage Service

This service is based on NEC's NeoFace Cloud — a cloud service that provides facial recognition functions. The NeoFace Cloud GPS Linkage Service combines authentication using facial recognition on the terminal side (smartphone, tablet, etc.) with GPS location information to accurately

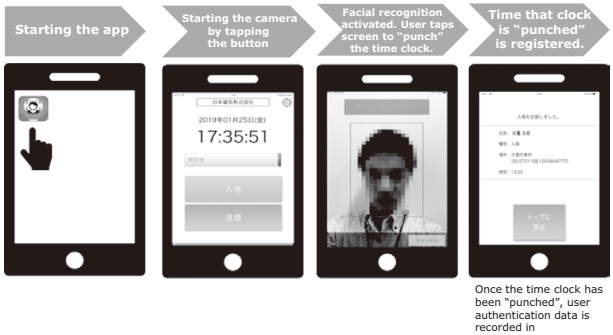

Fig. 3 Usage scenario of NeoFace Cloud GPS linkage service.

capture user data about who, when, and where.

Not only does this system make time clock punching obsolete, it also allows the company management to link to smartphones and other mobile devices to precisely track where and when employees are when they are not in the office — for example, if they are at a construction site or doing an inspection assignment (**Fig. 3**).

2.6 NeoFace Facial Data Management Service

This is a cloud service that automatically enables collected face data to be shared between this system with other facial recognition systems. The administrator can confirm the linkage conditions for each facial recognition system from the portal screen and set the scope of linkage for sharing.

This service gives managers more flexibility by making it possible to determine which facial recognition system should provide the face data according to the registered user. This can reduce the operational burden on administrators and managers.

In addition, face data can be managed according to group and multiple systems can be bundled by setting the scope of linkage. Thus, it is possible to set a management scope that matches management targets such as visitors and employees with management departments such as information system and general affairs departments.

We also support the construction of a link between the NeoFace Facial Data Management Service and other facial recognition systems, making it easier to quickly introduce this solution.

3. Conclusion

NEC offers an array of facial recognition products for various applications. Through the co-creation with our partners, we are able to provide an extensive array of solutions that integrate our facial recognition products with our partners' products. By providing our customers with these facial recognition products and services centering around the Facial Recognition Solution for Offices discussed in this paper, we will continue to enhance the security and convenience that facial recognition systems can provide.

Reference

1) NEC Press Release: NEC Face Recognition Technology Ranks First in NIST Accuracy Testing, October 2019
https://www.nec.com/en/press/201910/global_20191003_01.html

Authors' Profiles

SAIKI Makoto
Senior Manager
Platform Solution Division

HIRAO Koichiro
Manager
Platform Solution Division

OBAYASHI Nagatoshi
Assistant Manager
Platform Solution Division

MIYAKE Takashi
Platform Solution Division

LI Shanshan
Platform Solution Division

Information about the NEC Technical Journal

Thank you for reading the paper.
If you are interested in the NEC Technical Journal, you can also read other papers on our website.

Link to NEC Technical Journal website

Japanese | English

Vol.14 No.1 AI and Social Value Creation

Remarks for Special Issue on AI and Social Value Creation
Data — Powering Digitalization and AI

Vol.14 No.1
January 2020

Special Issue TOP

Papers for Special Issue

NEC's Efforts Toward Social Applications of AI
NEC's Commitment to Its New "NEC Group AI and Human Rights Principles" Policy
Human Resource Development in the Age of AI

AI-Enhanced Services/Solutions to Accelerate Digital Transformation
NEC Advanced Analytics Platform (AAPF) Promoting "AI Co-Creation"
Use of Individual Identification Based on the Fingerprint of Things Recognition Technology
Visual Inspection Solutions Based on the Application of Deep Learning to Image Processing Controllers
Remote Vehicle Surveillance Solution Based on Communication Prediction/Control Technology
NEC's Emotion Analysis Solution Supports Work Style Reform and Health Management
Facial Recognition Solution for Offices — Improved Security, Increased Convenience
Outline of an Auto Response Solution (AI Chatbot) for Assisting Business Automation and Labor Saving
AI for Work Shift Support — Accelerating the Transition to Human-Centered Business Value Creation
NEC Cloud Service for Energy Resource Aggregation Leveraging AI Technology
Patient Condition Change Signs Detection Technology for Early Hospital Discharge Support
Effective Data-Based Approaches to Disease Prevention/Healthcare Domains
Co-creation of AI-Based Consumer Insight Marketing Services
"Anokorowa CHOCOLATE" Lets People Savor Delicious Chocolates that Reflect the Mood of Special Moments in History

Cutting-Edge AI Technologies to Create the Future Together With Us
Heterogeneous Object Recognition to Identify Retail Products
Optical Fiber Sensing Technology Visualizing the Real World via Network Infrastructures
Intention Learning Technology Imitates the Expert Decision-Making Process
Graph-based Relational Learning
Retrieval-based Time-Series Data Analysis Technology
New Logical Thinking AI Can Help Optimize Social Infrastructure Management
Deep Learning Technology for Small Data
A Computing Platform Supporting AI