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Smart community infrastructures — Smart transportation by facial recognition payment (f-payment)

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Contents

Page

Foreword

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Transportation services receive an extremely large number of customers going to a variety of destinations at different times and places in the service networks. Conventional means of payment do not necessarily sufficiently satisfy the customer's individual purpose and preference when using transportation in their respective travel manner. Whenever customers use transportation and its related services, they have to complete payment procedures for the service costs. Formerly, the payment was made in cash in person between the customer and transportation operator. More recently, credit cards have been used. Also, d-payment has been developed and applied as a practical means of payment. This was introduced in ISO 37165. In d-payment, QR-codes are often used for payer identification and payment authorization. However, this application works only when QR-codes are prepared in advance and indicated. In this sense, d-payment applied with QR-codes is not a perfect payment manner. Now, thanks to biometric recognition technology development, the face can be used for identification and authorization in some fields through improved facial image resolution. Such improvement encourages facial recognition applications even in services where high security should be ensured, such as money transfers to/from bank accounts. Introducing digitally processed payments (d-payment) applied with facial recognition payment (f-payment) in transportation and its related services makes travel procedures easy because f-payment does not require the use of hands to make the payment.

Facial recognition is a biometric recognition technology that identifies persons by digitally viewing their faces, processing collected digital images, recognising the person and authorizing their action after identification. A typical application of facial recognition is passport holder identification in immigration inspection in international airports, ports and stations. This application does not allow the substitution of the faces for the facial image in the passport, but it provides immigration officers with another means to identify the traveller. After completing the identification, the traveller's entry into the country is authorized. This helps in effectively ensuring entry inspection security.

In passenger services, customers are requested to pay the fare and fees by purchasing tickets in advance of the transportation or paying cash directly to transportation operators when or after boarding. Cash payment has been replaced with credit card payment. Digital cards by smartphone and QR-codes indicated in paper tickets and smartphones have also become available. However, these means of payment require customers to bring, hold and show such cards and devices to transportation agents upon payment.

Facial recognition, where identification is determined by digitally collecting the customer's facial images as samples and comparing with benchmark images stored as references in a database in advance, has been applied as an identification and authorization tool for payment transactions. On the premise of ensuring privacy, users that allow and agree with the use of their biometric data to authorize payment of transport services, can benefit from a faster dispatch by the transportation operators. F-payment can be a supplement to other payment methods (e.g. cash, credit cards and digital payment). This document describes the concept of f-payment and how to apply it in transportation and its related services.