REC FACES

Id-Check

TECHNICAL DESCRIPTION

2020

CONTENT

PURPOSE

The **Id-Check** system is designed to optimize the verification process of customer identity in bank by using biometrics.

The system functionality:

1. Maintaining a biometric database of customers
2. Creating and maintaining customer lists for specialized processing.
3. Searching for a person by photos or images from cameras.
4. Verification of a customer's identity through document portrait, facial images from a webcam or a video source and a person's profile in the system.
5. Extracting photos from the document and performing identity checks.
6. Obtaining a photo of a person from a webcam or video stream and performing identity checks.
7. Select and configure Identity verification settings
8. Displaying status of verification and passing the selected checks.
9. Select and configure steps in the bank conveyor.
10. Performing verification checks based on data from an external system.

The system allows you to solve the following tasks:

1. Identifies fraudsters trying to acquire someone else’s documents.
2. Avoid errors during the identity verification in banking.
3. Speeds up the verification process of a bank’s custome

SOFTWARE DESCRIPTION

Component composition of the system

For the correct functioning of the System, the following minimum equipment is required:

- server;
- client PC.

A detailed description of the recommended characteristics of the equipment is indicated below.

ARCHITECHTURE

The system consists of the following components:

- **Id-Check Core** – the server part of the system, consisting of separate services, including the System settings interface, recognition algorithms, database and reports;
- **Tracker** – video preprocessing server.

It is recommended to install the System components as follows:

- **Server:** Id-Check Core + Tracker.

A schematic diagram of the installation of system components is given below.

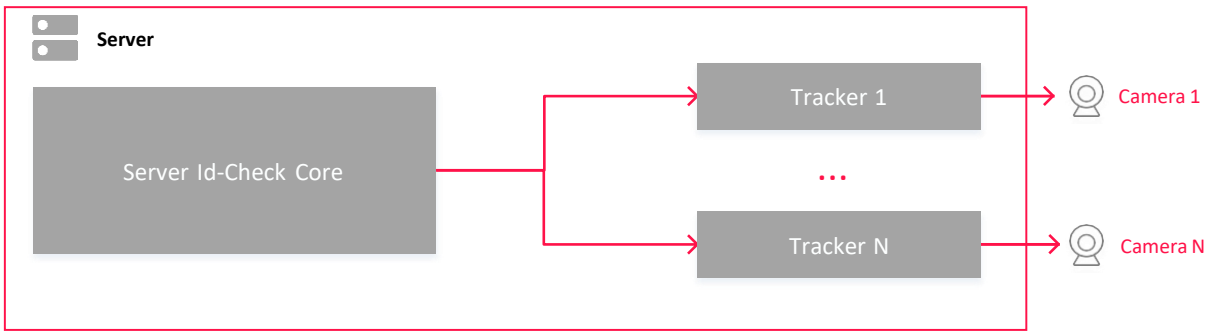

Figure 1. Schematic diagram of the connection of the System components

TECHNOLOGIES

The system is developed using the following programming languages and software:

- Golang;
- C#;
- Angular;
- RabbitMQ;
- Nginx;
- PostgreSQL;
- Redis.

List of Id-Check Core services

Id-Check Core includes the following services:

Table 1. Id-Check Core Services Description

Service	Description	Port
RabbitMQ	Service providing work with data queues	15672
Nginx	A web server and mail proxy server	80, 443, 23231
PostgreSQL	Free and open-source relational database management system (RDBMS)	5432
Redis	NoSQL database, open-source software	6379
IdMe-backup-client-server-api	System data backup service	11506
IdMe-event-configuration-api	Setting service of system events processor	11510
IdMe-event-storage-server-api	System events processing service	11511
IdMe-logging-server-api	Service is used to get logs from services	11508
IdMe-mas-server-settings	The main purpose of this service is to store and send the configuration to the modules. This service is run first. If an error occurs while the service is running, the system will not start	11102
IdMe-mas-server-api	Management service, which provides API for processing data about devices, applications, cameras	11101
IdMe-mfs-server-api	Service for storing and working with images	11300
IdMe-mfs-server-thumbnail	Service for working with thumbnails of the file storage	11301
IdMe-mi-sender-email	Service sends e-mail notifications	11400
IdMe-mi-sender-http	Service sends notifications by http (push)	11401
IdMe-mi-sender-smsmodem	Service for sending SMS	11402
IdMe-mkv-server-admin	User interface for the system administration module	11500
IdMe-mkv-server-api	The service contains API methods to work with the main functionality of the system	11501
IdMe-mkv-server-auth	Service for authorization in the system by entering a username and password	11502

Service	Description	Port
IdMe-mkv-server-report	Service for generating reports. Includes reports by gender, age, visits	11084
IdMe-mkv-server-ws	Application's back-end in order to work with the client via WebSocket	11503
IdMe-mkv-server-url-shortener	URL shortening service	11092
IdMe-mkv-scheduler-api	Service that implements work with scheduled tasks	11910
IdMe-modi-image-worker	Image processing service (crop/resize and etc.)	11700
IdMe-modi-ubda-tevian-01, **IdMe-modi-ubda-tevian-02,** **IdMe-modi-ubda-tevian-03,** **IdMe-modi-ubda-tevian-04**	Services for obtaining information on a face detected from the image	11710-11713
IdMe-monitoring-server-windows	Service for Windows services monitoring	11507
IdMe-mrp-matching-tevian-go	Service provides facial recognition process by the images provided	11806
IdMe-mrp-server-api	Service that provides API for processing data during working with the streaming video	11800
IdMe-mrp-server-broker	Service is used to manage a request queue to the matching algorithms	11821
IdMe-ms-server-filecache	Service provides caching files	11900
IdMe-support-server-api	Monitoring service that allows to work with metrics and desktops	11901
IdMe-svg-converter-api	Service for converting images	11513
IdMe-modi-server-api	Service for processing discrete images	11701
IdMe-mkv-client-profiles-import	Profiles import service	11514

One of the server requirements for installing the Id-Check Core software package is the absence on the server of the software specified in the table above and the presence of free ports indicated in the table.

CORRECT WORK REQUIREMENT

Server Id-Check

It is recommended to install Id- Check Core. Server characteristics directly depend on the number of cameras processed by the system. An approximate calculation for the most common values is presented in the table below.

Table 2. Server Requirements

Number of cameras	CPU (Core)	RAM (GB)	HDD (GB)	SSD (GB)
1 camera	5	16	600	300
2 cameras	6	16	700	300
3 cameras	8	16	700	300
5 cameras	20	24	800	300
7 cameras	14	24	900	300
10 cameras	18	40	1000	300

Operating System: Windows 10, Windows Server 2012 and higher. The account (login / password) (including for the remote user) should remain unchanged throughout the installation. Account (login / password) should allow to increase privileges to the Administrator if necessary.

CAMERA REQUIREMENTS

1. The camera must be fixed using the special bracket supplied to minimize the blurring caused by the movement of the camera. It is allowed to mount the camera on a tripod; the camera installation height is from 1.5 to 2 m.
2. The recommended camera placement: a person looks at the camera and moves towards it or across the camera's line of sight.
3. Screens, interactive kiosks, boards, banners, should not block a person moving.
4. For recognition and identification purposes, it is required to use cameras with Varifocal lenses.
5. The lens focal length can be selected in the range from 9 to 40 mm.
6. The camera tilt at the end of the face detection area should be within 10 deg.
7. The optimal camera height above the floor is 2.2 m, it is desirable that the beginning of the face detection area is located further than 8.0-8.5 m.
8. Uniform and constant level of illumination must be provided indoor. For optimal facial recognition, indirect lighting should be such those objects have uniform illumination without shadows or glare. The recommended light intensity should be about 300 Lux (a minimum 150 Lux and maximum 600 Lux).
9. At the beginning of process of face recognition it is required to mount a configure the camera in such a way that the size of the adult's face is about 160x160 pixels (the line of sight is more than 2 meters in width – a little wider than the width of outstretched arms).

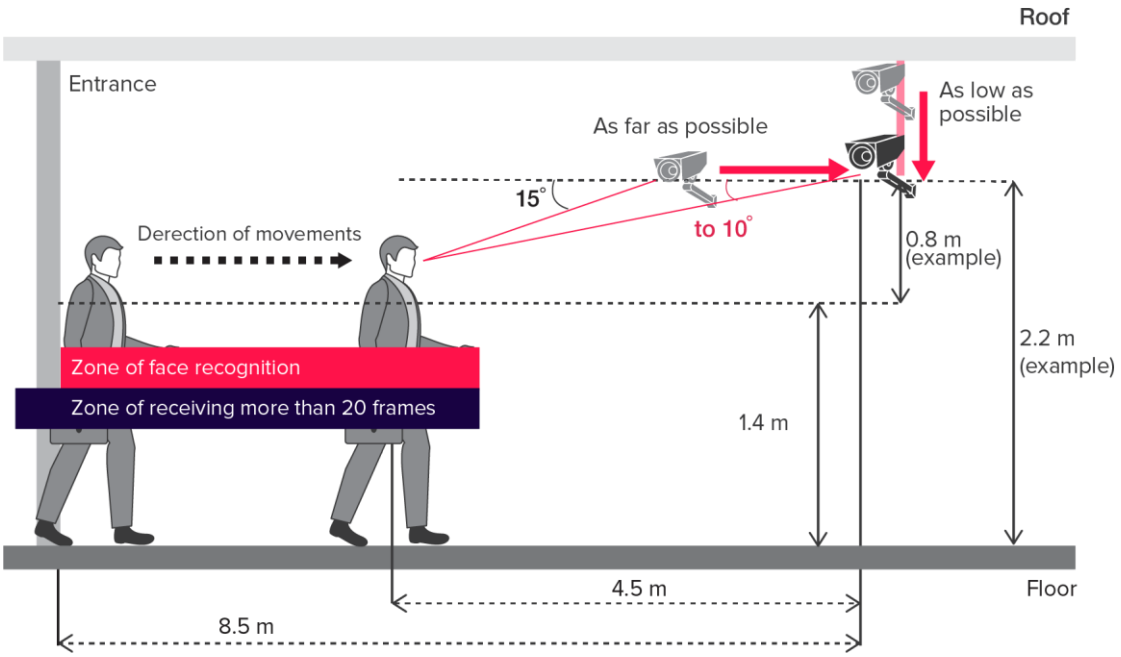

Figure 2. Camera placement recommendations

LIST OF MANUALS

- User manual
- Administrator’s guide.