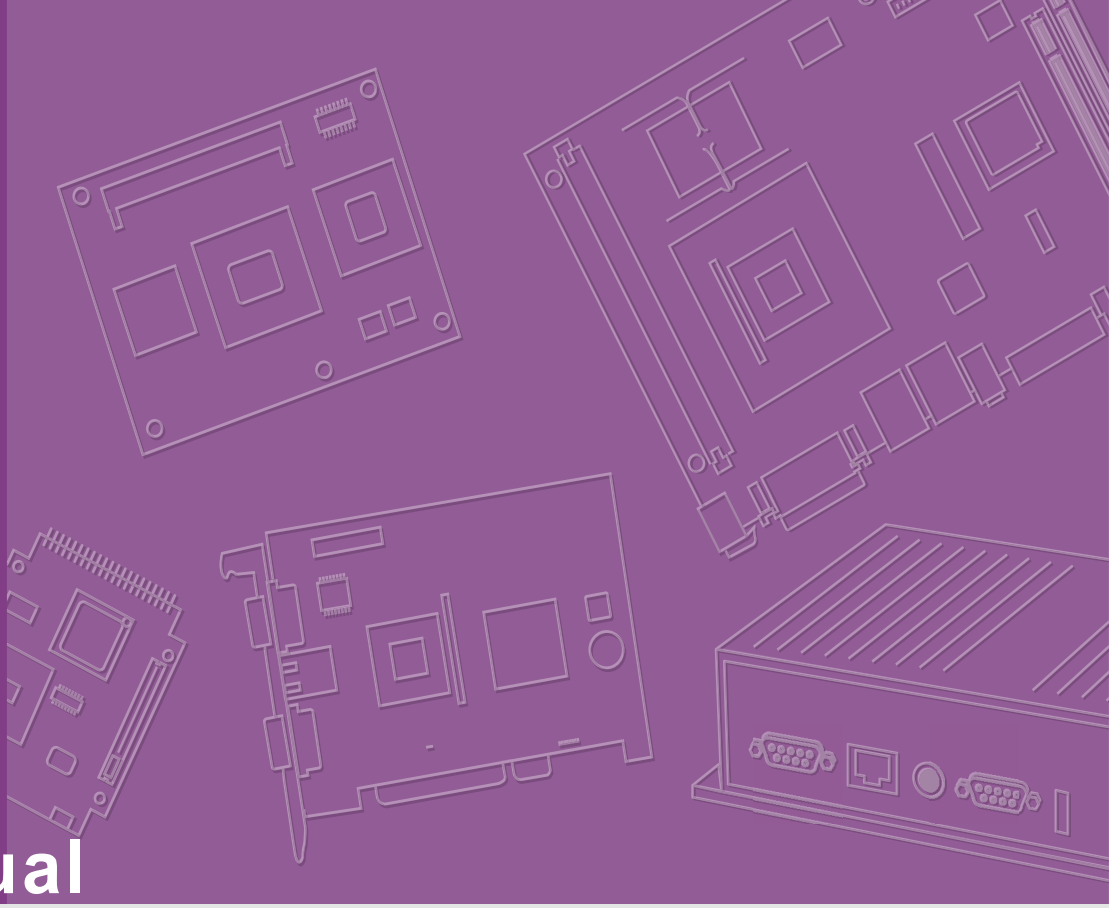

User Manual

FaceView

Artificial Intelligence
Facial Recognition Application

ADVANTECH

Enabling an Intelligent Planet

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3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FM

This equipment has passed the FM certification. According to the National Fire Protection Association, work sites are classified into different classes, divisions and groups, based on hazard considerations. This equipment is compliant with the specifications of Class I, Division 2, Groups A, B, C and D indoor hazards.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions, and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advant-ech.com.

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

CONTENTS

Chapter 1 Introduction.....1

1.1 Introduction 2
Figure 1.1 FaceView Data Flow..... 2
Figure 1.2 FaceView Ingredients 2

Chapter 2 System Environment.....3

2.1 System Requirement..... 4
Table 2.1: FaceView System Requirement 4
2.2 Folder Hierarchy..... 4
Figure 2.1 Folder Structure..... 4

Chapter 3 FaceView Installation 5

3.1 FaceView Installation 6
Figure 3.1 Initial Installation Menu 6
Figure 3.2 Installation Menu 6
Figure 3.3 Ongoing Installation..... 7
Figure 3.4 Initial Installation Menu of Microsoft Visual C++ Run-time..... 7
Figure 3.5 Initial Installation Menu of MongoDB 8
Figure 3.6 Installation types of MongoDB..... 8
Figure 3.7 Installation setting of MongoDB..... 9
Figure 3.8 Uncheck Install MongoDB Compass option 9
Figure 3.9 Finished Installation of MongoDB..... 10
Figure 3.10FaceView Shortcuts..... 10
Figure 3.11FaceView DB Service Notification 11

Chapter 4 FaceView Application.....13

4.1 License Key for Activation..... 14
Figure 4.1 Dialog to Input License Key for SW Distribution Version 14
4.2 Visitor Identification..... 14
Figure 4.2 UI of Visitor Identification..... 14
Figure 4.3 List View of Visitor Identification 15
4.3 Visitor Management 15
Figure 4.4 Visitor Management Page 15
Figure 4.5 Registration of a New Visitor 16
4.4 Camera Capture..... 16
Figure 4.6 Photo by Camera..... 16
4.5 Profile Photo..... 17
Figure 4.7 Photo by Selection..... 17
Figure 4.8 Photo Clipping in Upload Photo..... 17
4.6 Edit Visitor..... 18
Figure 4.9 Registered Visitor Editing 18
4.7 Delete Visitor..... 18
Figure 4.10Registered Visitor Deletion..... 18
4.8 Sort by - All, VIP, Blacklist..... 19
Figure 4.11Sort by VIP filter..... 19
Figure 4.12Sort by Blacklist filter 19
4.9 Environment Configurations..... 20

4.9.1 General Settings 20
Figure 4.13Configurations for FaceView settings 20
4.9.2 About Us 21
Figure 4.14FaceView descriptions in About Us page 21
4.9.3 Hotkeys 21
Figure 4.15Runtime Information Window 21

Chapter 5 FaceView DB Export/Import 23

5.1 Export Visitor List from FaceView DB 24
Figure 5.1 FaceView Shortcuts 24
Figure 5.2 Information Window of FaceView DB Export 24
Figure 5.3 Location of FaceView DB Export 24
5.2 Import Visitor List into FaceView DB 25
Figure 5.4 Location of FaceView DB Import 25
Figure 5.5 Information Window of FaceView DB Import 25

Chapter 6 FaceView Demo Utility 27

6.1 FaceView Demo Utility 28
6.1.1 Initialization 28
Figure 6.1 Initialization of Facial Recognition Engine 28
6.1.2 Recognition 28
Figure 6.2 Facial Recognition 29
6.1.3 Comparison 29
Figure 6.3 Image Similarity Comparison 29
6.1.4 Quality 30
Figure 6.4 Photo Quality Checker 30

Chapter 7 FaceView Development Setup 31

7.1 FaceView Development Setup 32
Figure 7.1 Location of FaceView API files 32
Figure 7.2 FaceView sdk_include path in Microsoft Visual Studio 32
Figure 7.3 FaceView sdk_library path in Microsoft Visual Studio .. 33
Figure 7.4 Location to Place Your Own Execution File 33

Chapter 8 Conclusion 35

8.1 Conclusion 36

Appendix A Contact information 37

A.1 Contact information 38

Chapter 1

Introduction

1.1 Introduction

Powered by CyberLink's FaceMe®, an industry-leading facial recognition engine, Advantech's FaceView application provides precise and scalable real-time facial recognition for various AIoT applications in the retail, hospitality, and public safety fields. Advantech also provides an easy-to-integrate SDK for rapid integration with existing systems using APIs. FaceView SDK offers 7 categories of API and will be introduced one by one in the following sections. In the following illustrations, we can find the data flow and ingredients of FaceView. For data flow, current FaceView focuses on standalone architecture to realize visitor facial recognition. As for the ingredients, FaceView offers not only the APIs/SDK kit for development but also the integrated application for use.

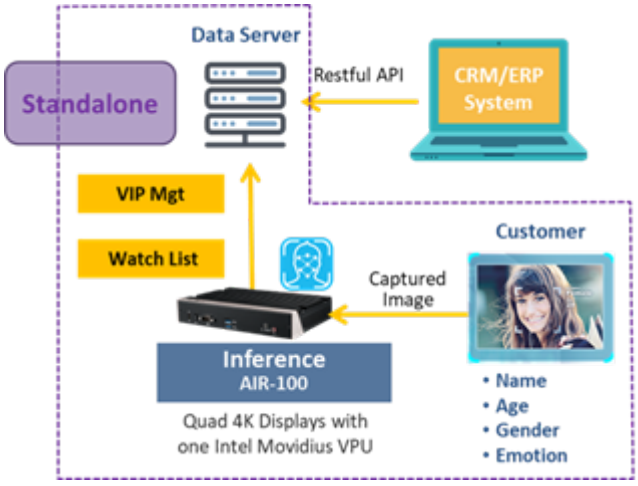

Figure 1.1 FaceView Data Flow

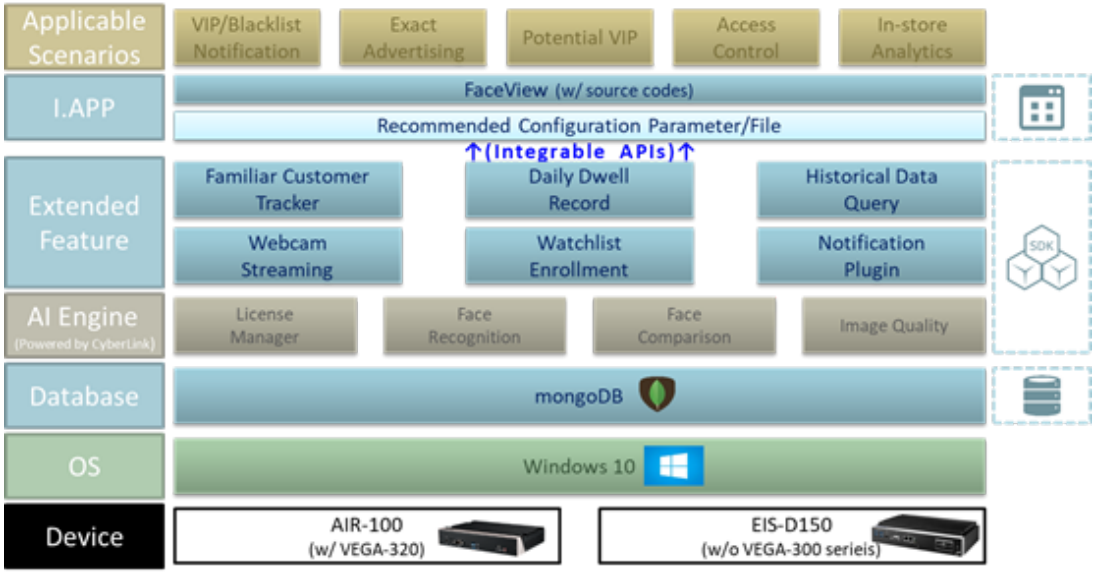

Figure 1.2 FaceView Ingredients

Chapter 2

System Environment

2.1 System Requirement

Here can be found the required working environment for FaceView runtime.

Table 2.1: FaceView System Requirement	
OS	Windows 10 64-bit
Driver	Advantech SUSI V4.0 (or above)
CPU	Intel Atom, Core i Series (Verified)
Memory	4GB or above
Storage	32GB or above (Including Windows 10 OS)
Display	1920 x 1080 pixel resolution

Note! *No support for Windows S3/S4: When a system is comes back from a S3/S4 status, FaceView will be closed by the OS or needs to restart.*

2.2 Folder Hierarchy

After the installation of FaceView you will see the sub folders Program and Sample. The Program folder contains executable and redistributable files for launching applications. This means that you need to copy your application execution file into this folder to make a successful launch. You can find FaceView application and demo utility execution files in this folder. Next, the Sample folder includes source code files examples of projects to learn how to best use the FaceView demo utility by yourself.

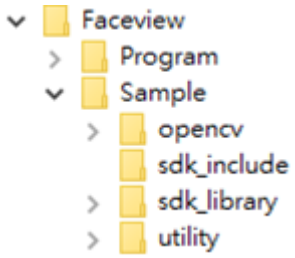

Figure 2.1 Folder Structure

Chapter 3

FaceView Installation

3.1 FaceView Installation

1. First click the installer execution file to launch the installation process and then press the **Next** button.

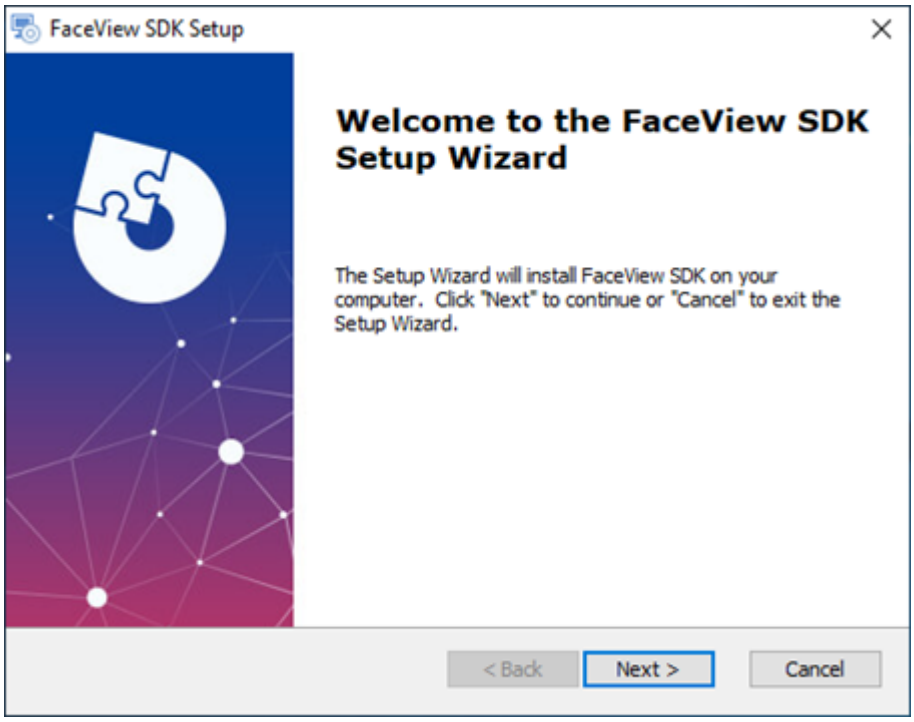

Figure 3.1 Initial Installation Menu

2. Next press the **Install** button to start installing.

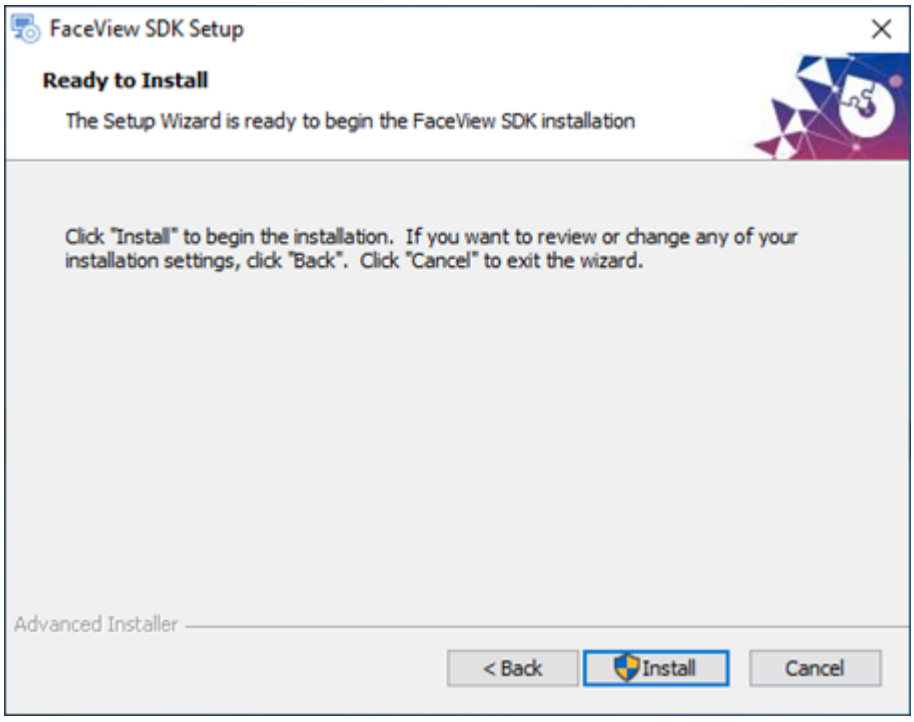

Figure 3.2 Installation Menu

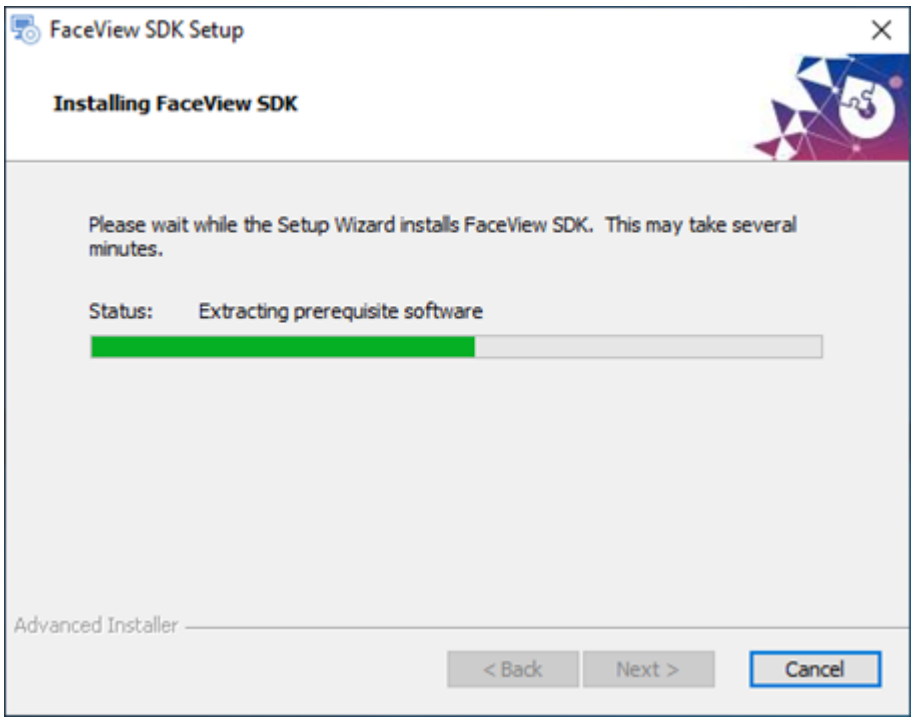

Figure 3.3 Ongoing Installation

3. During FaceView installation, it will also check and install Microsoft Visual C++ Runtime if it doesn't already exist. Please check the agreement and press the **Install** button to start this accessory installation.

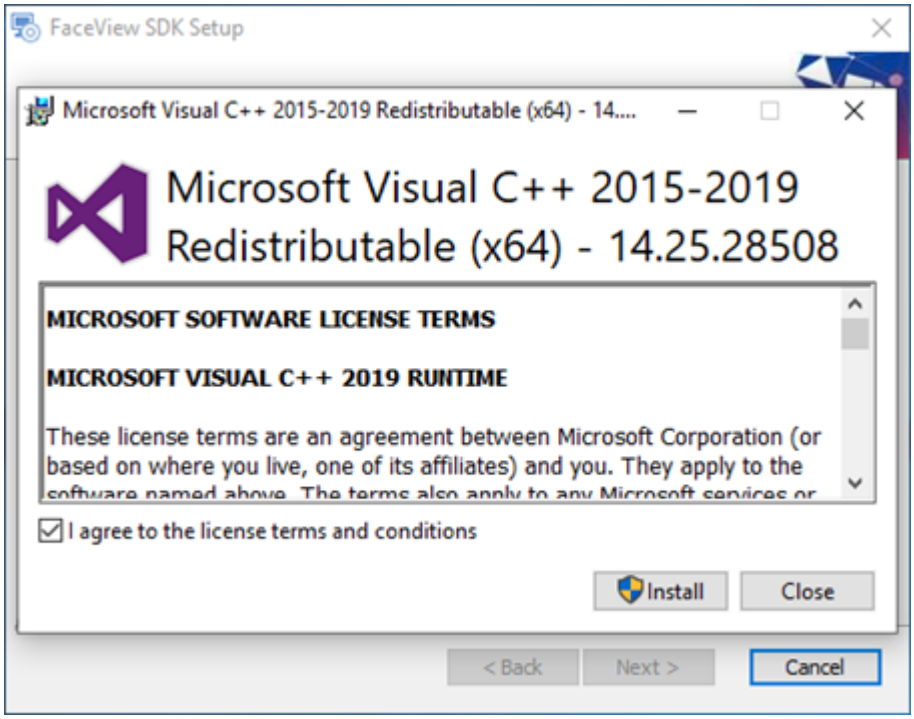

Figure 3.4 Initial Installation Menu of Microsoft Visual C++ Runtime

4. Another accessory installation during the FaceView installation is MongoDB.

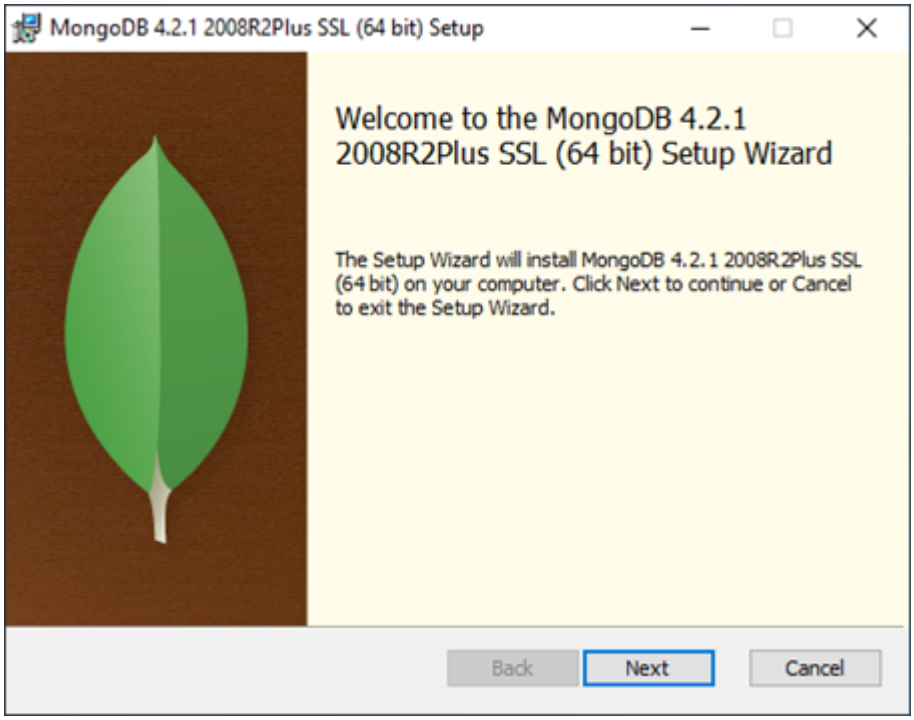

Figure 3.5 Initial Installation Menu of MongoDB

5. Please choose the **Complete** option to start the installation.

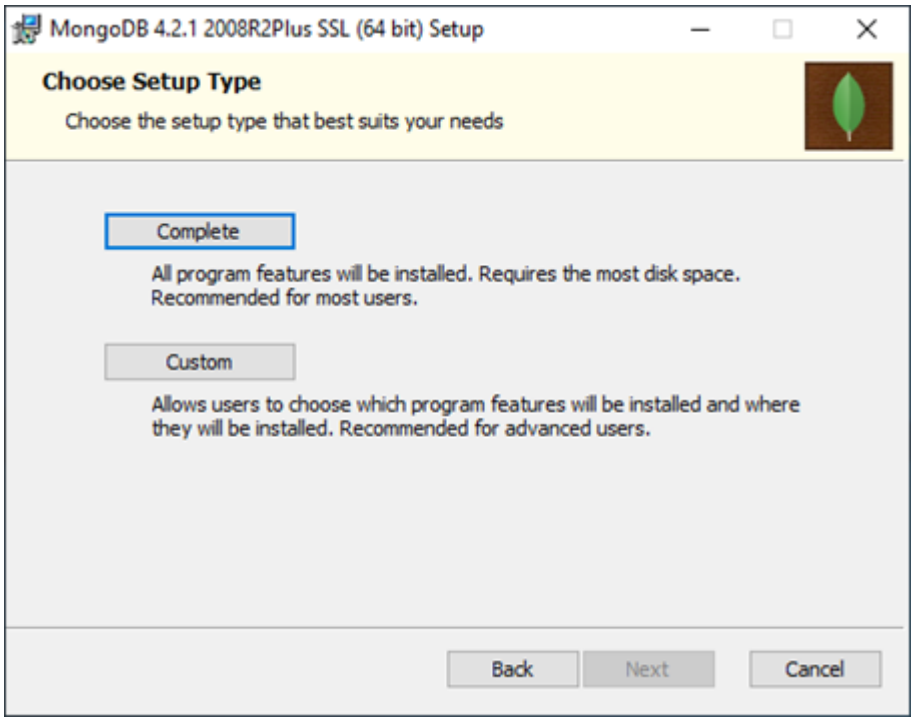

Figure 3.6 Installation types of MongoDB

6. Please use the default setting and press the **Next** button.

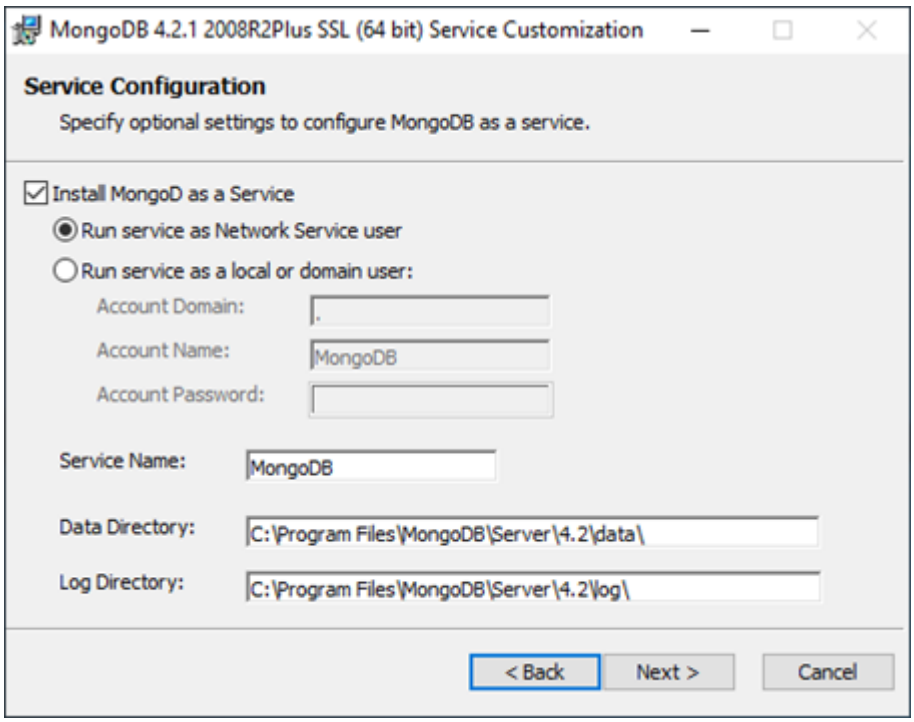

Figure 3.7 Installation setting of MongoDB

7. Then we additionally uncheck the **Install MongoDB Compass** option to reduce space required because the related package is unused by FaceView.

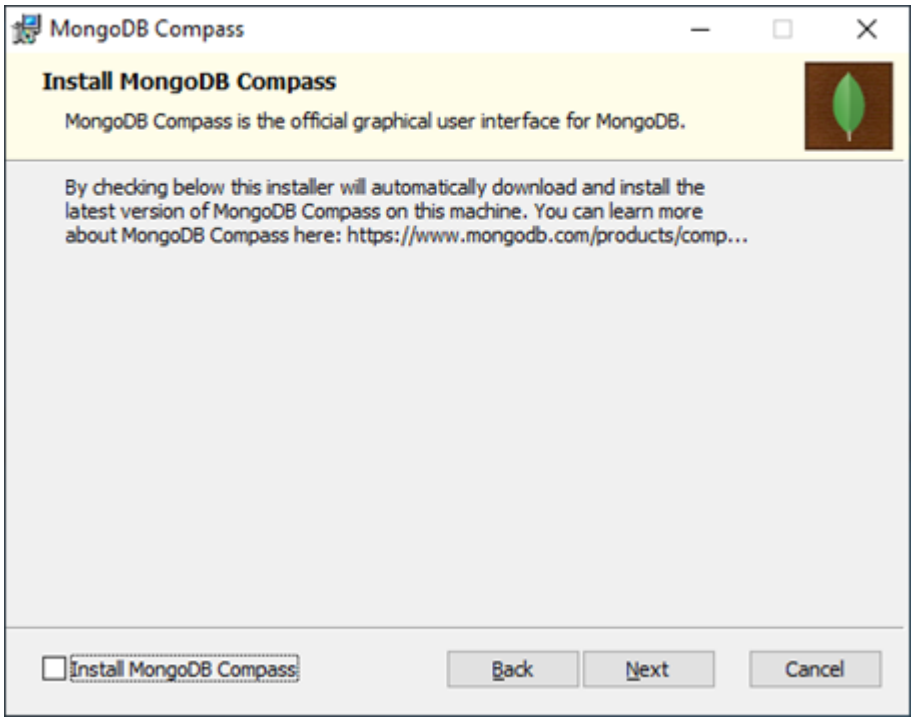

Figure 3.8 Uncheck Install MongoDB Compass option

8. Finally, press the **Finish** button to proceed with the FaceView installation.

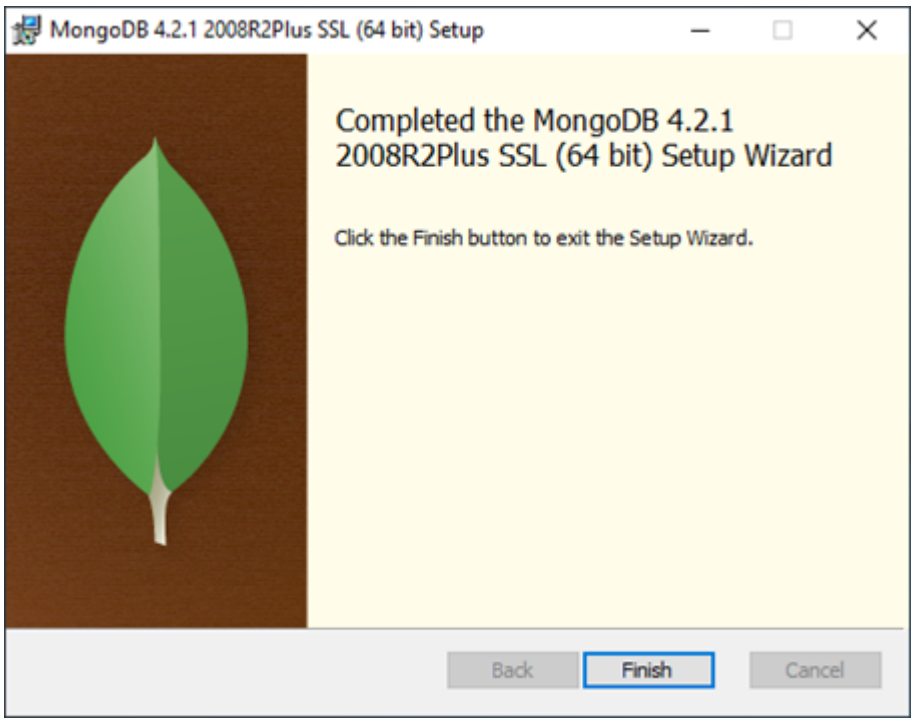

Figure 3.9 Finished Installation of MongoDB

9. After a successful FaceView installation, we can find some shortcuts in the Windows Start Menu.

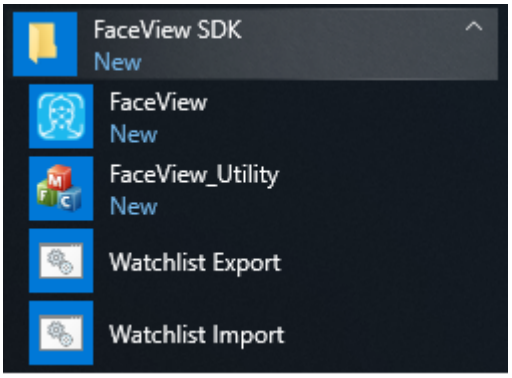

Figure 3.10 FaceView Shortcuts

10. The first time to launch FaceView (or after a major Windows update), it's necessary to allow access of the FaceView database service. Click **Allow Access**.

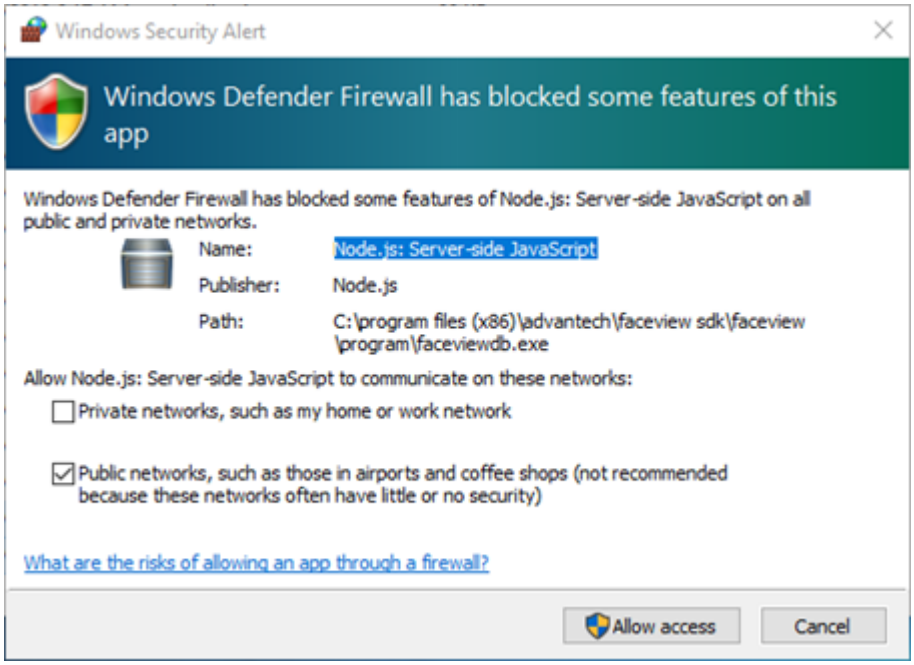

Figure 3.11 FaceView DB Service Notification

Chapter 4

FaceView Application

4.1 License Key for Activation

Type #1: HW Bundle

You do not need to input a license key for HW Bundle. The limitation of the HW bundle license for this is applicable only for EIS and AIR series HW devices.

Type #2: SW Distribution

When launching FaceView for the first time, a pop-up dialog will show up to input the license key.

Figure 4.1 Dialog to Input License Key for SW Distribution Version

4.2 Visitor Identification

Three types of visitors can be identified in FaceView.

- VIP
- Blacklist
- Unrecognized

After launching FaceView, the Visitor Identification content will show up. The major part in the left side is video display. The video is decoded from the linked webcam and serves as a live view. The identified faces with orange frames means VIP visitors. Similarly, blue ones are defined as blacklist visitors and black ones are unknown visitors. Each identified face also lists age, gender and emotion. Especially for prior-registered VIP/blacklist members, we can also see their names on the screen.

Next, let's see the right side list view.

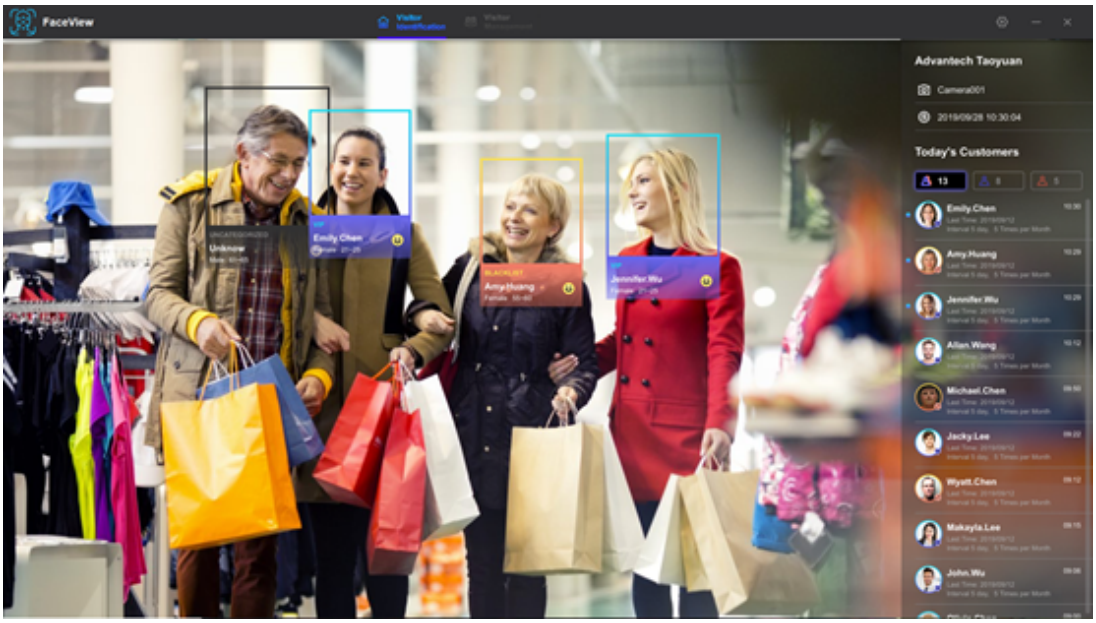

Figure 4.2 UI of Visitor Identification

Starting from the top of the right-side list view, the first description can be set up in the Environment Configurations – General Settings page. Sequentially, we can find the selected webcam and current time/date. Moreover, FaceView provides filter buttons to quickly switch the interested analytics group, which include all, VIP and blacklist types. Furthermore, each identified registered visitor also includes their daily visit information. Last visit time, daily dwelling duration, and frequency can be found here.

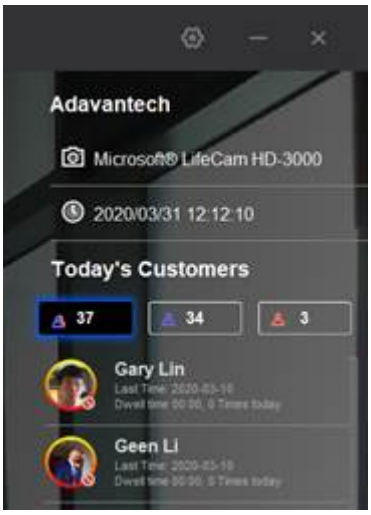

Figure 4.3 List View of Visitor Identification

4.3 Visitor Management

At the top-middle of FaceView, we can click the button of Visitor Management and then switch to the related function page.

Create Visitor

At the top-right of the Visitor Management page, we can find the button for **Create Visitor.**

Figure 4.4 Visitor Management Page

After clicking the **Create** button, we can see the following page to add a new registered visitor as a VIP or Blacklist them. Here are a total of FOUR required items to fill in and after that the Save button will show up. For photos, we need to click the **Edit** button to perform further functions.

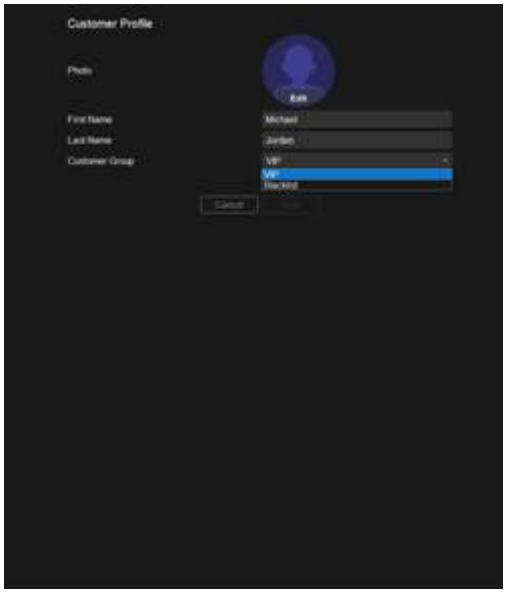

Figure 4.5 Registration of a New Visitor

Note! *First Name or Last Name individually accepts 2~20 letters or digits.*

4.4 Camera Capture

After clicking the **Edit** button, we can take a photo with a linked webcam. When FaceView detects an acceptable face size, the circle button at the bottom-middle will be enabled for you to click. Then we can get the photo for the ongoing registration.

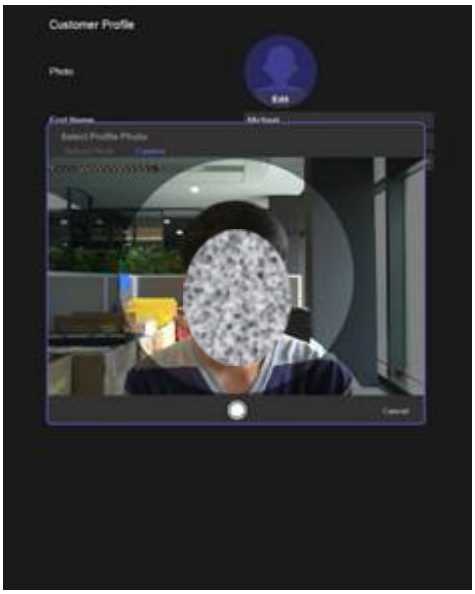

Figure 4.6 Photo by Camera

4.5 Profile Photo

When we click the **Upload Photo** button on the Select Profile Photo subpage, we can select an existing photo by further clicking the **Select** button to scan from your computer.

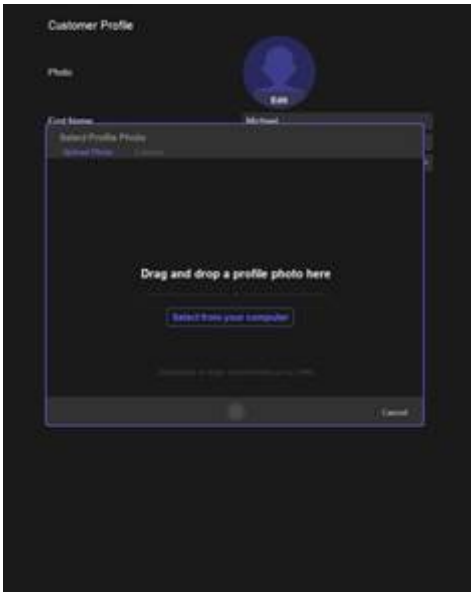

Figure 4.7 Photo by Selection

If photo clipping is required, it's available by simply clicking and moving a mouse cursor to define a target area.

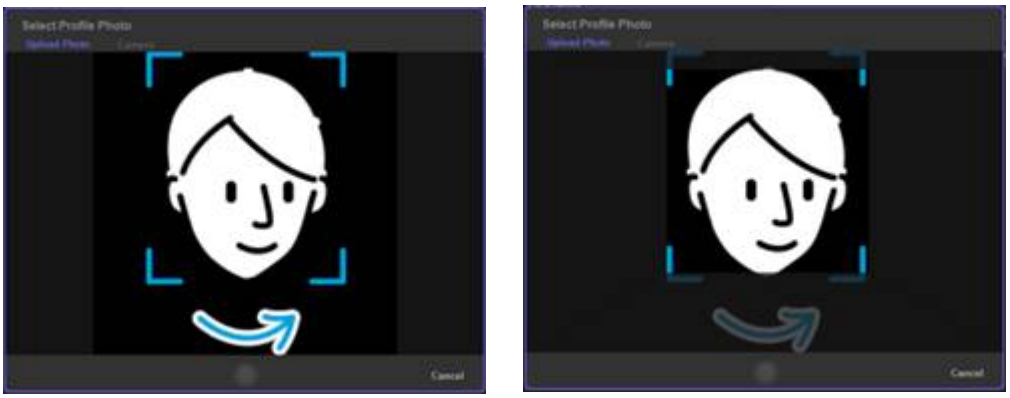

Figure 4.8 Photo Clipping in Upload Photo

4.6 Edit Visitor

Refer to the Visitor Management Page mentioned earlier where we can click the pencil icon to edit an existing registered visitor. Related operations are the same as those mentioned in the Create Visitor paragraph.

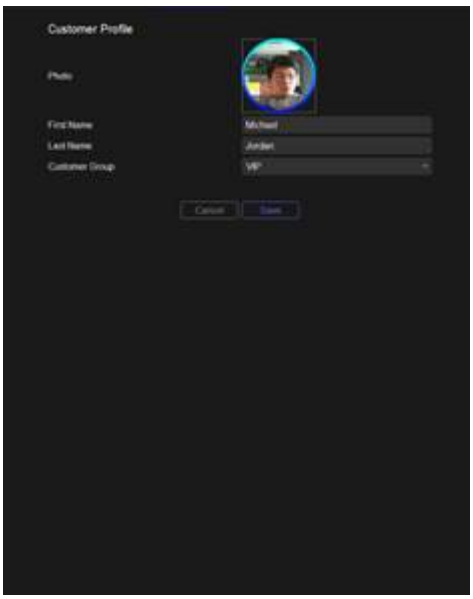

Figure 4.9 Registered Visitor Editing

4.7 Delete Visitor

Refer to Visitor Management Page mentioned earlier where we can click the trash can icon to delete an existing registered visitor. When we do this, a pop-up message will show up to ask you to confirm.

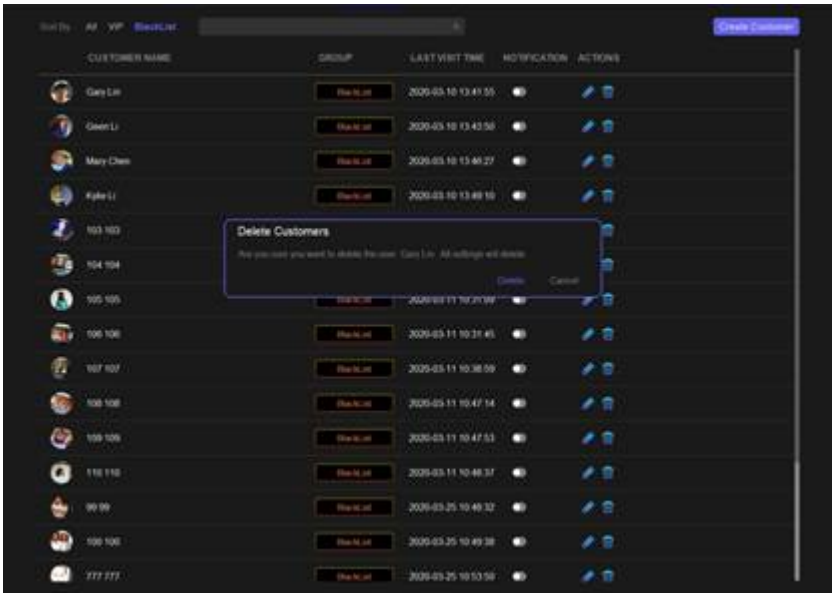

Figure 4.10 Registered Visitor Deletion

4.8 Sort by - All, VIP, Blacklist

In the Visitor Management Page, FaceView provides group filters to show the interested registered visitor list. Near the top-left of this page, if we click the VIP or Blacklist button, the related list will show up exclusively. By default, the All button is enabled and the full list is displayed. In addition, it's also available for key-ing in specific letters in the right gray column for a specific search.

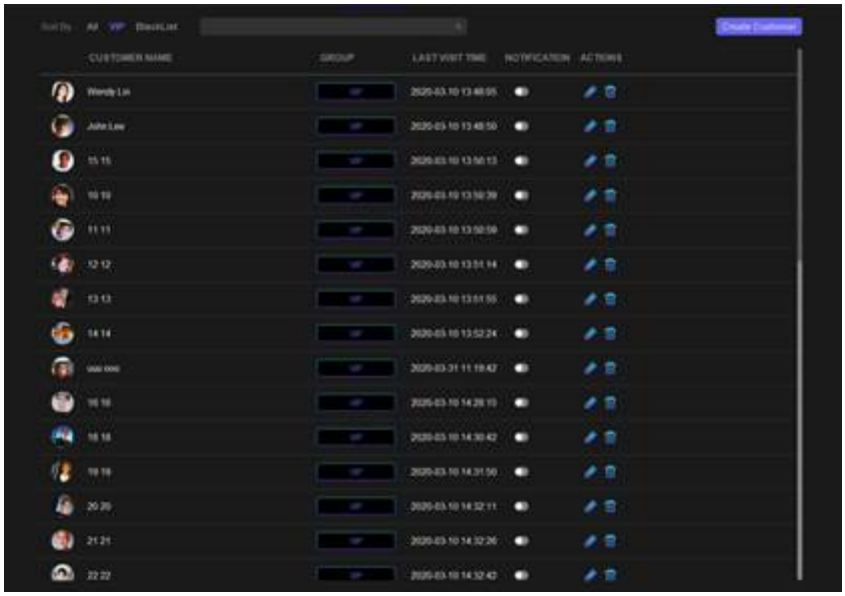

Figure 4.11 Sort by VIP filter

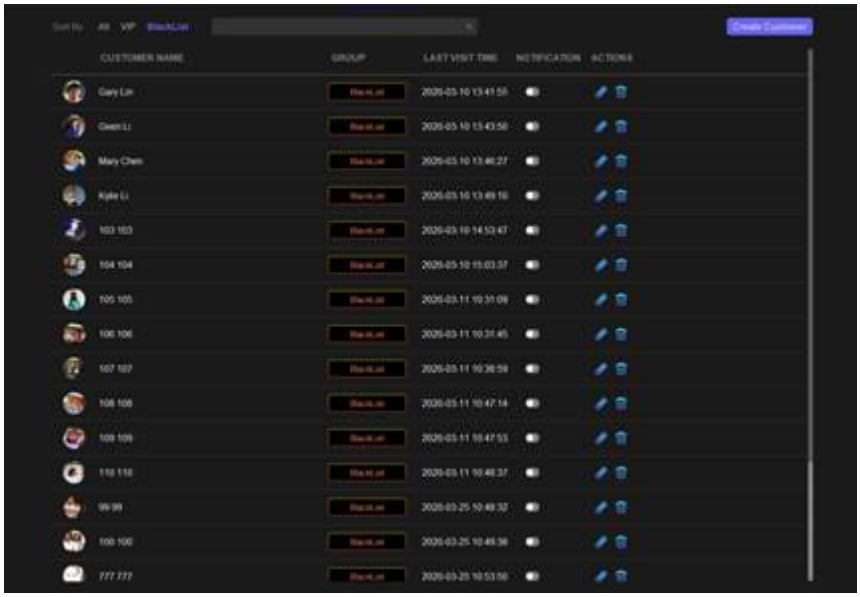

Figure 4.12 Sort by Blacklist filter

4.9 Environment Configurations

4.9.1 General Settings

Click the gear icon at the top-right in FaceView to show this page. Firstly, for organization-related info, we can click the **Edit** button to select an existing photo. Name and Description items accept 2~50 letters or digits.

Secondly, for Camera settings, we can select the specific webcam to show its live video and have several advanced video parameters to set. Note that FaceView only supports popular video resolutions 720P and 1080P.

Thirdly, as to AI Execution, an AI Model can provide three complexity levels. When we talk about better recognition accuracy, the order is UH, VH and H1. However, it's a trade-off decision between accuracy and performance. For improving the latter, we can still take a device with more computing power. FaceView will only identify and mark faces with sizes greater than *Min Face Size*. It accepts from 40 to 240 in pixels. The last AI Threads will assign how many CPU cores and VPU chips can be used.

Finally, FaceView supports English in the current release.

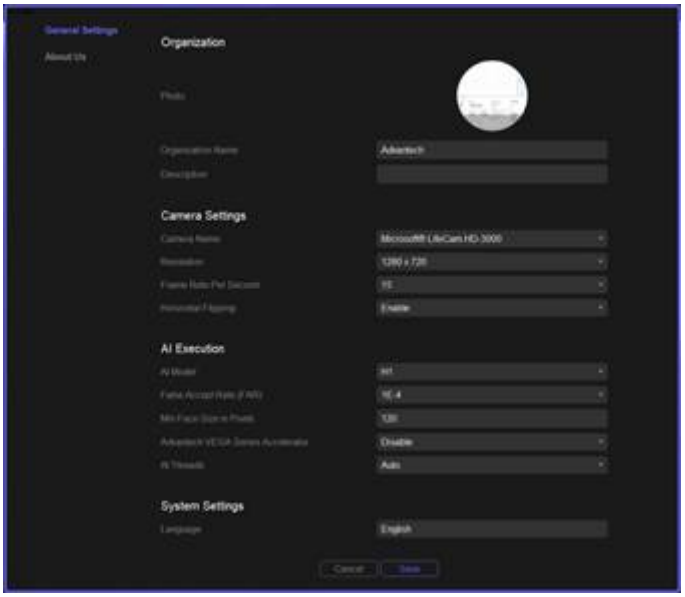

Figure 4.13 Configurations for FaceView settings

4.9.2 About Us

In this page, it shows the brief introduction of FaceView.

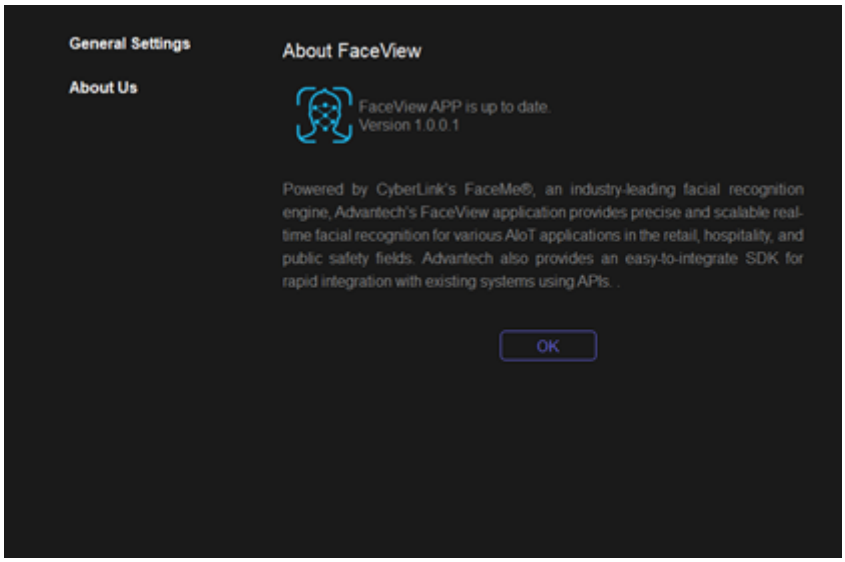

Figure 4.14 FaceView descriptions in About Us page

4.9.3 Hotkeys

In the Visitor Identification page, we can key in “show” directly and then information window will show up at the top left corner to display runtime info and configuration. In the same way, we can close the information windows.

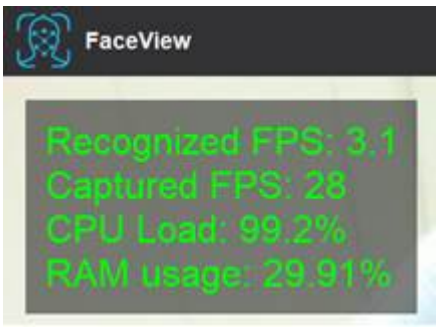

Figure 4.15 Runtime Information Window

Chapter 5

FaceView DB Export/ Import

5.1 Export Visitor List from FaceView DB

Go to the Windows Start menu and find the FaceView folder.

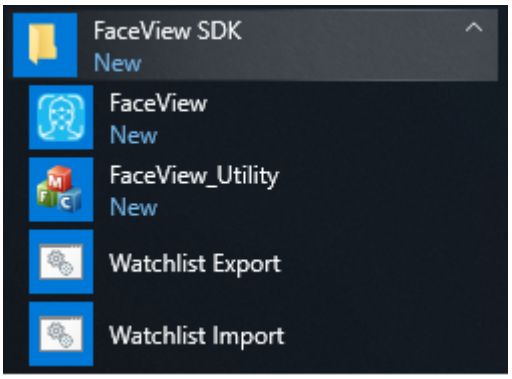

Figure 5.1 FaceView Shortcuts

Click **Watchlist Export** to get the current visitor list from FaceView DB. The extracted visitor list will be placed in the following specific folder.

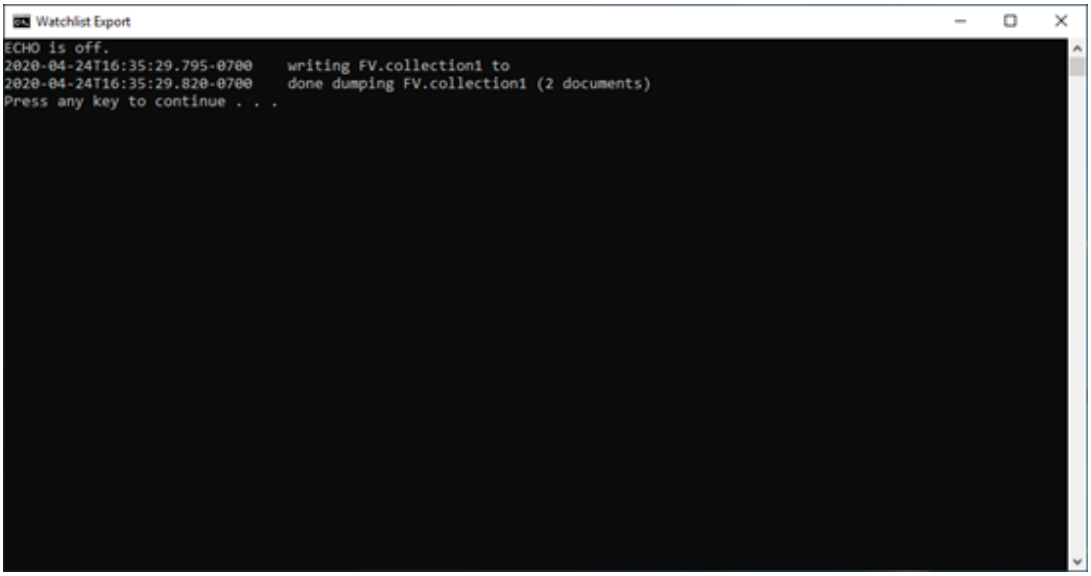

Figure 5.2 Information Window of FaceView DB Export

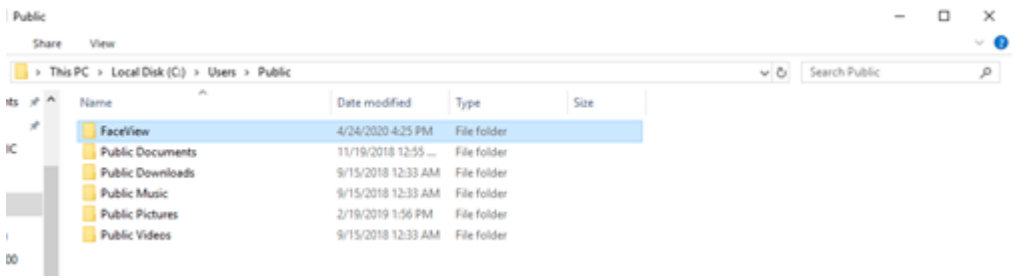

Figure 5.3 Location of FaceView DB Export

As a result, if it's required to duplicate the visitor list to another FaceVIew device, the generated FaceView folder will be used.

5.2 Import Visitor List into FaceView DB

The prerequisite to use Watchlist Import is the above-mentioned FaceView folder generated by FaceView Watchlist Export function. Then use the required folder to override the FaceView folder in the following folder.

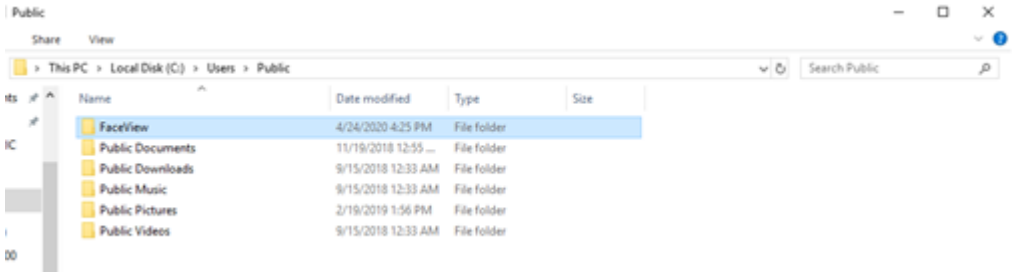

Figure 5.4 Location of FaceView DB Import

Next click Watchlist Import to duplicate a visitor list. It also shows how many registers are loaded successfully.

Note! *After execution of Watchlist Import, the existing visitor list in the current database will be overridden by the imported visitor list.*

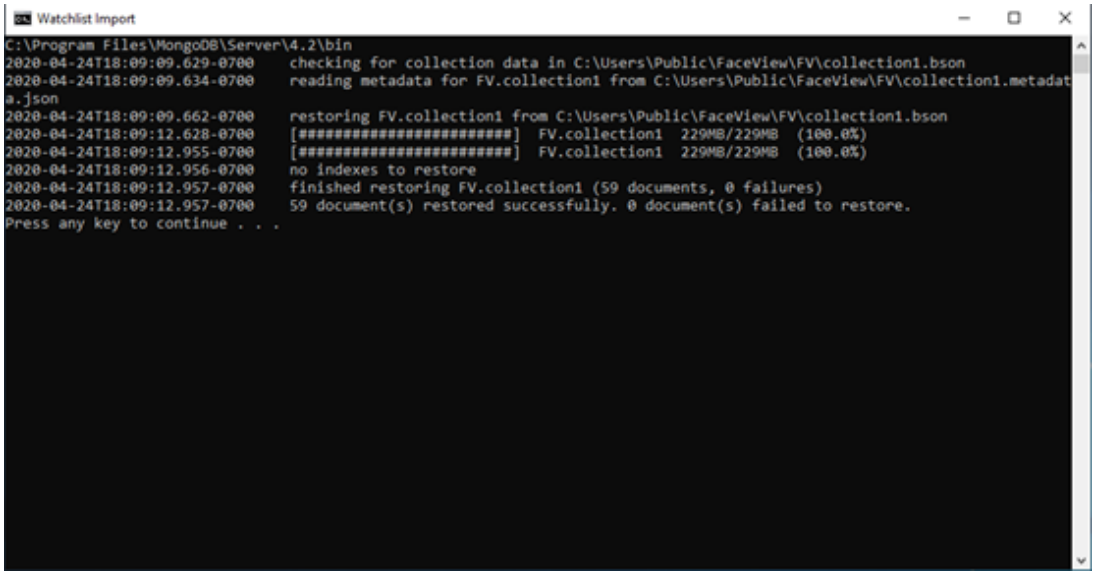

Figure 5.5 Information Window of FaceView DB Import

Chapter 6

FaceView Demo Utility

6.1 FaceView Demo Utility

Note that FaceView also provides the source codes of the Demo Utility.

6.1.1 Initialization

Here we can find the related parameters used in the FaceView facial recognition engine which we mentioned in the General Settings paragraph. By clicking the **Load default** button and then we need to click **Set** button to finish Step1. Finally, we need to enter a license key to activate the license and initialize the SDK sequentially. Each operation will show a message to let you know if it was successful or not. After successfully initializing, if you want to try different parameter settings, please remember to close and restart the utility.

To Deactivate a License, generally, it's used only when we need to transfer the license authority from the current device to a new one.

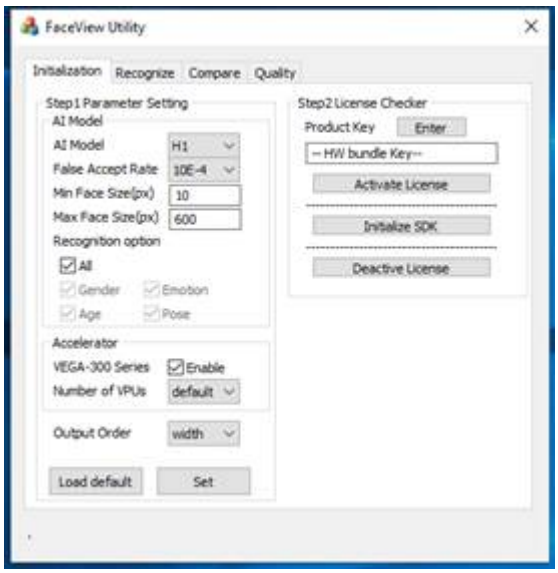

Figure 6.1 Initialization of Facial Recognition Engine

6.1.2 Recognition

We can select an existing photo or open a linked webcam to understand facial recognition results.

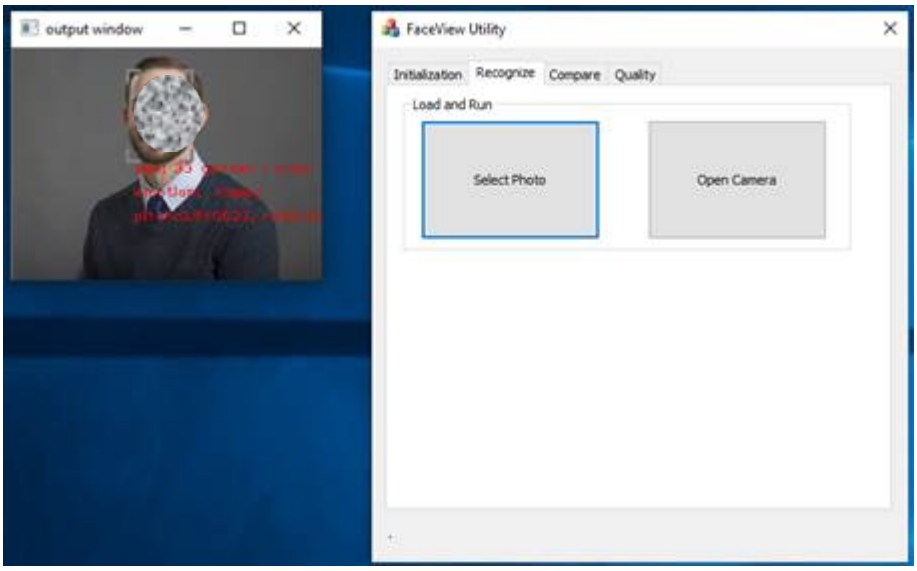

Figure 6.2 Facial Recognition

6.1.3 Comparison

We can pick two photos to get comparison results for similarity.

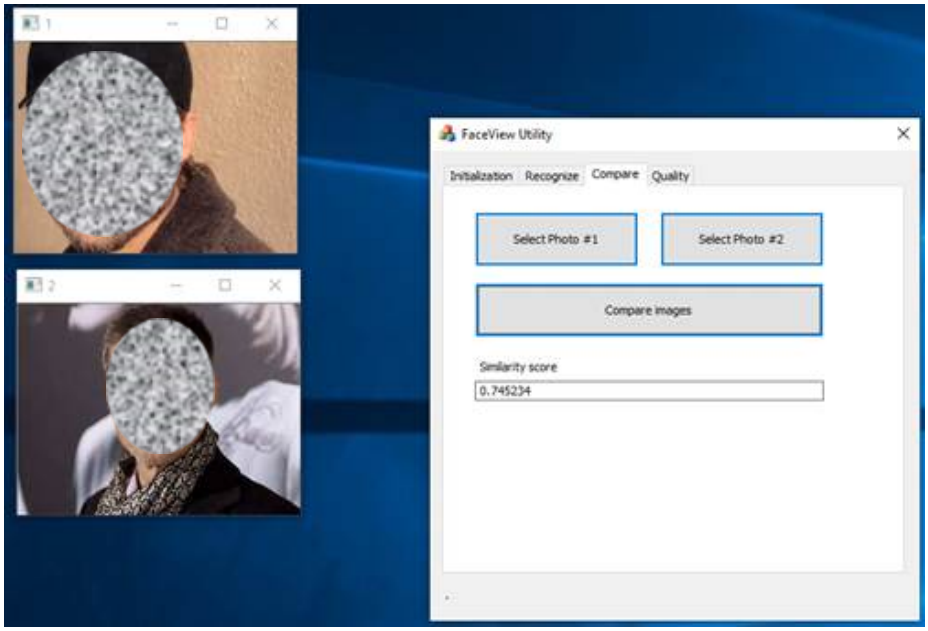

Figure 6.3 Image Similarity Comparison

6.1.4 Quality

We can pick a photo to get the image quality result.

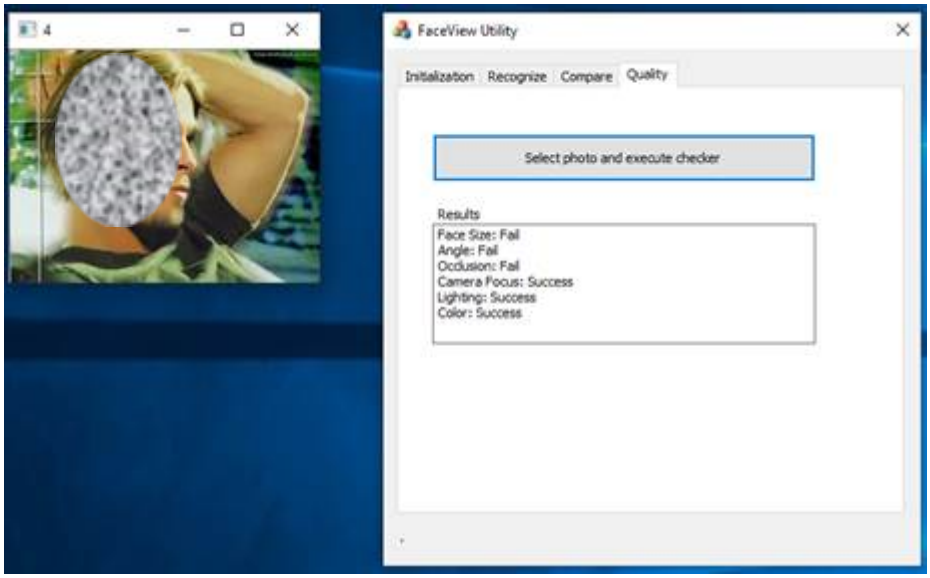

Figure 6.4 Photo Quality Checker

Chapter 7

FaceView Development Setup

7.1 FaceView Development Setup

The header files and lib files of FaceView APIs can be found in the following path: folders of sdk_include and sdk_library.

Figure 7.1 Location of FaceView API files

If your IDE is Microsoft Visual Studio, it's required to add two dependencies in your project. One is to include the path of sdk_include in **Additional Include Directories**.

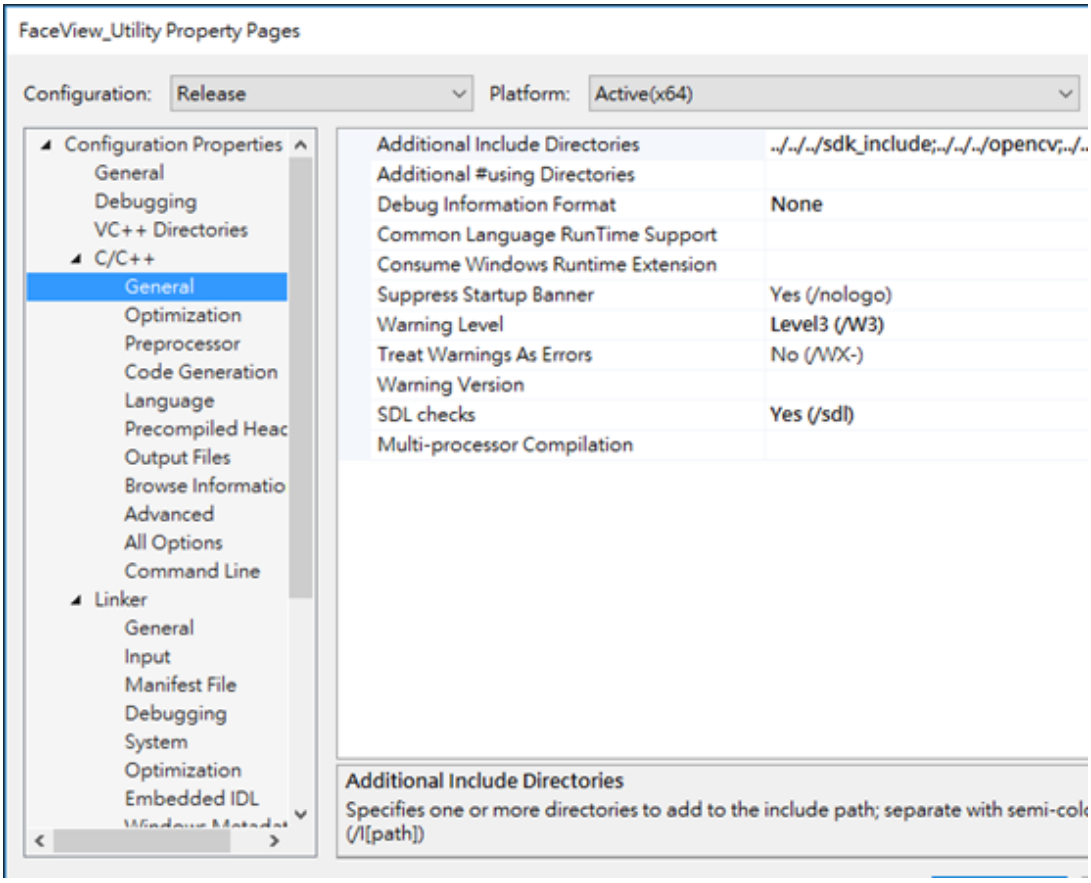

Figure 7.2 FaceView sdk_include path in Microsoft Visual Studio

The other is to include the path of the sdk_library in Additional Dependencies.

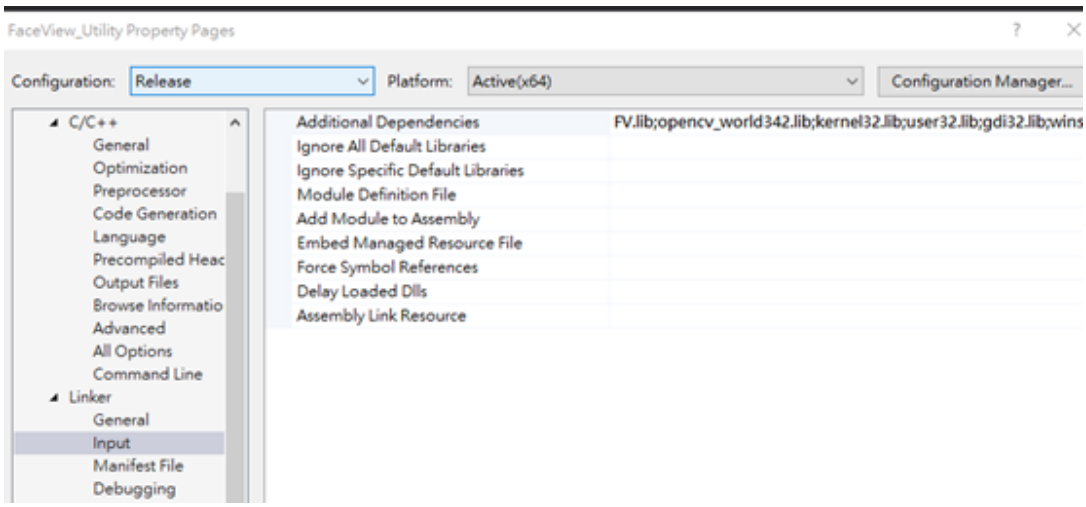

Figure 7.3 FaceView sdk_library path in Microsoft Visual Studio

As for FaceView API details, you can find related information in another API User Manual document. Eventually, if you have an execution file developed by yourself through FaceView APIs, it's recommended that you put your execution file in the following program folder to be executable.

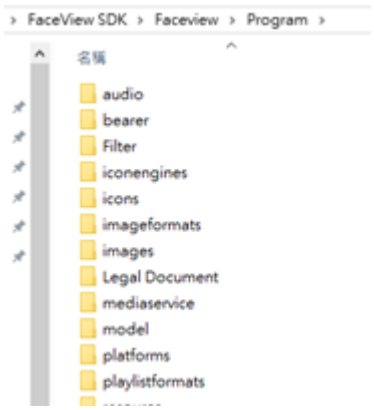

Figure 7.4 Location to Place Your Own Execution File

Chapter 8

Conclusion

8.1 Conclusion

FaceView provides real-time facial detection (identity, age, gender, emotion), visitor behavior analytics dashboard, visitor management and notification functions. It also provides an easy-to-integrate SDK for rapid integration with existing systems using APIs. For example for a touchless control system, FaceView can be further integrated into an elevator control system for contactless service and improved customer security. Eventually, the featured highlights of FaceView can be summarized as follows.

- Simplify your deployment with hardware & software integrated solutions and quick integration into existing systems using APIs.
- 99.7% accuracy for real-time identification with advanced image pre-processing.
- Enhanced services with VIP and watchlist management and visualized dashboard.

Appendix A

Contact information

A.1 Contact information

- Product information: alan.kao@advantech.com.tw
- Technical support: Seven.Lin@advantech.com.tw

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www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

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