ArcSoft Face Tracking

开发指导文档

© 2017 ArcSoft, Inc. All rights reserved.

ArcSoft Corporation
46601 Fremont Blvd.
Fremont, CA 94538
http://www.arcsoft.com

Trademark or Service Mark Information

ArcSoft Inc. and ArcWare are registered trademarks of ArcSoft Inc.

Other product and company names mentioned herein may be trademarks and/or service marks of their respective owners. The absence of a trademark or service mark from this list does not constitute a waiver of ArcSoft Inc.'s trademark or other intellectual property rights concerning that trademark or service mark.

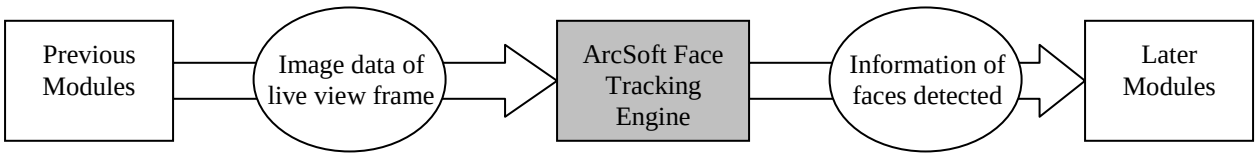
The information contained in this document is for discussion purposes only. None of the information herein shall be interpreted as an offer or promise to any of the substance herein or as an agreement to contract or license, or as an implication of a transfer of rights. Any and all terms herein are subject to change at the discretion of ArcSoft. Copying, distributing, transferring or any other reproduction of these documents or the information contained herein is expressly prohibited, unless such activity is expressly permitted by an authorized representative of ArcSoft, Inc.

© 2017 ArcSoft, Inc. All rights reserved.

© 2017 ArcSoft, Inc. All rights reserved.

1. 概述

虹软人脸跟踪引擎工作流程图:



1.1. 运行环境

- Windows

1.2. 系统要求

- 32 位系统，Windows7 以上

1.3. 依赖库

- None

© 2017 ArcSoft, Inc. All rights reserved.

2. 结构与常量

2.1. 基本类型

```
typedef MInt32 AFT_FSDK_OrientPriority;
typedef MInt32 AFT_FSDK_OrientCode;
```

所有基本类型在平台库中有定义。 定义规则是在 ANSIC 中的基本类型前加上字母“M”同时将类型的第一个字母改成大写。例如“long” 被定义成“MLong”

2.2. 数据结构与枚举

2.2.1. AFT_FSDK_FACERES

描述

检测到的脸部信息

定义

```
typedef struct{
       MInt32               nFace;
       AFT_FSDK_OrientCode lfaceOrient;
       MRECT                *rcFace;
} AFT_FSDK_FACERES, *LPAFT_FSDK_FACERES;
```

成员描述

rcFace	人脸矩形框信息
nFace	人脸个数
lfaceOrient	人脸角度信息

2.2.2. AFT_FSDK_Version

描述

SDK 版本信息

定义

```
typedef struct{
       MInt32 lCodebase;
       MInt32 lMajor;
```

© 2017 ArcSoft, Inc. All rights reserved.

```
        MInt32 lMinor;
        MInt32 lBuild;
        MPChar Version;
        MPChar BuildDate;
        MPChar CopyRight    ;
} AFT_FSDK_Version;
```

Member description

lCodebase	代码库版本号
lMajor	主版本号
lMinor	次版本号
lBuild	编译版本号，递增
Version	字符串形式的版本号
BuildDate	编译时间
CopyRight	copyright

2.2.3. AFT_FSDK_OrientPriority

描述

定义脸部检测角度的优先级

定义

```
enum _AFT_FSDK_OrientPriority{
        AFT_FSDK_OPF_0_ONLY        = 0x1,
        AFT_FSDK_OPF_90_ONLY       = 0x2,
        AFT_FSDK_OPF_270_ONLY      = 0x3,
        AFT_FSDK_OPF_180_ONLY      = 0x4,
        AFT_FSDK_OPF_0_HIGHER_EXT  = 0x5,
};
```

成员描述

AFT_FSDK_OPF_0_ONLY	检测 0 度方向
AFT_FSDK_OPF_90_ONLY	检测 90 度方向
AFT_FSDK_OPF_270_ONLY	检测 270 度方向
AFT_FSDK_OPF_180_ONLY	检测 180 度方向
AFT_FSDK_OPF_0_HIGHER_EXT	检测 0， 90， 180， 270 四个方向, 0 度更优先

© 2017 ArcSoft, Inc. All rights reserved.

2.2.4. AFT_FSDK_OrientCode

描述

定义检测结果中的人脸角度

定义

```
enum _AFT_FSDK_OrientCode {
       AFT_FSDK_FOC_0                = 0x1,
       AFT_FSDK_FOC_90               = 0x2,
       AFT_FSDK_FOC_270              = 0x3,
       AFT_FSDK_FOC_180             = 0x4
};
```

成员描述

AFT_FSDK_FOC_0	0 度
AFT_FSDK_FOC_90	90 度
AFT_FSDK_FOC_270	270 度
AFT_FSDK_FOC_180	180 度

2.2.5. 支持的颜色格式

描述

颜色格式及其对齐规则

定义

ASVL_PAF_I420	8-bit Y 层，之后是 8-bit 的 2x2 采样的 U 层和 V 层
ASVL_PAF_YUYV	Y0, U0, Y1, V0
ASVL_PAF_RGB24_B8G8R8	BGR24, B8G8R8

© 2017 ArcSoft, Inc. All rights reserved.

3. API 说明

3.1. AFT_FSDK_InitialFaceEngine

原型

```
MRESULT AFT_FSDK_InitialFaceEngine(
       MPChar        AppId,
       MPChar        SDKKey,
       MByte*        pMem,
       MInt32        lMemSize,
       MHandle       *pEngine,
       AFT_FSDK_OrientPriority iOrientPriority,
       MInt32        nScale,
       MInt32        nMaxFaceNum
);
```

描述

初始化脸部检测引擎

参数

AppId	[in]	用户申请 SDK 时获取的 App Id
SDKKey	[in]	用户申请 SDK 时获取的 SDK Key
pMem	[in]	分配给引擎使用的内存地址
lMemSize	[in]	分配给引擎使用的内存大小
pEngine	[out]	引擎 handle
iOrientPriority	[in]	期望的脸部检测角度的优先级
nScale	[in]	用于数值表示的最小人脸尺寸 有效值范围[2,16] 推荐值 16
nMaxFaceNum	[in]	用户期望引擎最多能检测出的人脸数 有效值范围[1,20]

返回值

成功返回 MOK，否则返回失败 code。失败 codes 如下所列:

MERR_INVALID_PARAM	参数输入非法
MERR_NO_MEMORY	内存不足

3.2. AFT_FSDK_FaceFeatureDetect

原型

```
MRESULT AFT_FSDK_FaceFeatureDetect(
```

© 2017 ArcSoft, Inc. All rights reserved.

```
        AFT_FSDK_ENGINE              hEngine,
        LPASVLOFFSCREEN       pImgData,
        LPAFT_FSDK_FACERES         pFaceRes,
);
```

描述

根据输入的图像检测人脸，一般用于视频检测，多帧方式

参数

hEngine	[in]	引擎 handle
pImgData	[in]	带检测图像信息
pFaceRes	[out]	人脸检测结果

返回值

成功返回 MOK，否则返回失败 code。失败 codes 如下所列:

MERR_INVALID_PARAM	参数输入非法
MERR_NO_MEMORY	内存不足
MERR_BAD_STATE	状态不正确

3.3. AFT_FSDK_UninitialFaceEngine

原型

```
MRESULT AFT_FSDK_UninitialFaceEngine(
        MHandle         hEngine,
);
```

描述

销毁引擎，释放相应资源

参数

hEngine	[in]	引擎 handle

返回值

成功返回 MOK，否则返回失败 code。失败 codes 如下所列:

MERR_INVALID_PARAM	参数输入非法

3.4. AFT_FSDK_GetVersion

原型

© 2017 ArcSoft, Inc. All rights reserved.

```
const AFT_FSDK_Version * AFT_FSDK_GetVersion(
       MHandle      hEngine
);
```

参数

hEngine	[in]	引擎 handle

描述

获取 SDK 版本信息

© 2017 ArcSoft, Inc. All rights reserved.

4. 示例代码

注意,使用时请替换申请的 **APPID SDKKEY**，并设置好文件路径和图像尺寸

```
#include <stdio.h>
#include <stdlib.h>
#include <stdint.h>
#include <Windows.h>
#include "arcsoft_fsdk_face_tracking.h"
#include "merror.h"

#pragma comment(lib,"libarcsoft_fsdk_face_tracking.lib")

#define WORKBUF_SIZE        (40*1024*1024)
#define APPID       ""                  //APPID
#define SDKKey      ""                  //SDKKey

/* 获取视频帧数据，并保存到ASVLOFFSCREEN结构体中 */
MRESULT GetPreviewData(ASVLOFFSCREEN *offInput)
{
	MInt32 res = MOK;

	/* get frame data. add your code here */
	/* ... ... */

	return res;
}
int main()
{
	/* 初始化引擎和变量 */
	MRESULT nRet = MERR_UNKNOWN;
	MHandle hEngine = nullptr;
	MInt32 nScale = 16;
	MInt32 nMaxFace = 10;
	MByte *pWorkMem = (MByte *)malloc(WORKBUF_SIZE);
	if (pWorkMem == nullptr)
	{
		return -1;
	}
	nRet = AFT_FSDK_InitialFaceEngine(APPID, SDKKey, pWorkMem, WORKBUF_SIZE,
&hEngine, AFT_FSDK_OPF_0_HIGHER_EXT, nScale, nMaxFace);
	if (nRet != MOK)
	{
		return -1;
	}
	/* 打印版本信息 */
	const AFT_FSDK_Version * pVersionInfo = nullptr;
	pVersionInfo = AFT_FSDK_GetVersion(hEngine);
	fprintf(stdout, "%d %d %d %d\n", pVersionInfo->lCodebase, pVersionInfo-
>lMajor, pVersionInfo->lMinor, pVersionInfo->lBuild);
	fprintf(stdout, "%s\n", pVersionInfo->Version);
	fprintf(stdout, "%s\n", pVersionInfo->BuildDate);
	fprintf(stdout, "%s\n", pVersionInfo->CopyRight);
```

© 2017 ArcSoft, Inc. All rights reserved.

```
	/* 读取视频帧数据，并保存到ASVLOFFSCREEN结构体 */
	ASVLOFFSCREEN offInput = { 0 };
	int frame = 1;
	while (MOK == GetPreviewData(&offInput))
	{
		LPAFT_FSDK_FACERES	FaceRes = nullptr;
		/* 人脸跟踪 */
		nRet = AFT_FSDK_FaceFeatureDetect(hEngine, &offInput, &FaceRes);
		if (nRet != MOK)
		{
			fprintf(stderr, "Face Tracking failed, error code: %d\n",
nRet);
		}
		else
		{
			fprintf(stdout, "The number of face: %d\n", FaceRes->nFace);
			for (int i = 0; i < FaceRes->nFace; i++)
			{
				fprintf(stdout, "Frame : %d, Face[%d]:
rect[%d,%d,%d,%d]\n", frame++, i, FaceRes->rcFace[i].left, FaceRes->rcFace[i].top,
FaceRes->rcFace[i].right, FaceRes->rcFace[i].bottom);
			}
		}
	}
	/* 释放引擎和内存 */
	nRet = AFT_FSDK_UninitialFaceEngine(hEngine);
	if (nRet != MOK)
	{
		fprintf(stderr, "UninitialFaceEngine failed , errorcode is %d \n",
nRet);
	}
	free(offInput.ppu8Plane[0]);
	free(pWorkMem);
	return 0;
}
```

© 2017 ArcSoft, Inc. All rights reserved.