ArcSoft Age Estimation

开发指导文档

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

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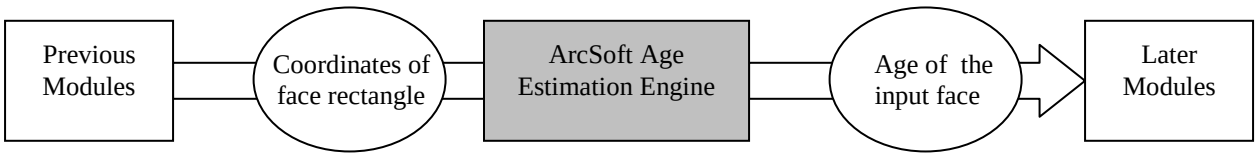
Chapter 1: 概述

虹软年龄检测引擎工作流程图.



1.1. 运行环境

- Windows

1.2. 系统要求

- 64 位系统，Windows7 以上

1.3. 依赖库

- None

Chapter 2: 结构与常量

2.1. 基本类型

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

2.2.1. ASAE_FSDK_Version

描述

SDK 版本信息

定义

```
typedef struct{
	MInt32 lCodebase;
	MInt32 lMajor;
	MInt32 lMinor;
	MInt32 lBuild;
	MPChar Version;
	MPChar BuildDate;
	MPChar CopyRight;
} ASAE_FSDK_Version;
```

成员变量

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	版权信息

2.2.2. ASAE_FSDK_AGERESULT

描述

定义年龄检测结果信息

定义

```
typedef struct{
        MInt32          * pAgeResultArray;
        MInt32          lFaceNumber;
} ASAE_FSDK_AGERESULT, *LPASAE_FSDK_AGERESULT;
```

成员变量

pAgeResultArray	检测出的年龄结果数组
lFaceNumber	检测出的年龄结果个数

2.2.3. ASAE _FSDK_AGEFACEINPUT

描述

定义脸部信息

定义

```
Typedef struct{
        MRECT           *pFaceRectArray;
        MInt32          *pFaceOrientArray;
        MInt32          lFaceNumber;
} ASAE_FSDK_AGEFACEINPUT, *LPASAE_FSDK_AGEFACEINPUT;
```

成员变量

pFaceRectArray	人脸框信息数组
pFaceOrientArray	输入的人脸角度数组。
lFaceNumber	人脸个数

2.3. 枚举

2.3.1. ASAE_FSDK_AgeOrientCode

描述

定义基于逆时针方向的人脸角度

定义

```
enum ASAE_FSDK_AgeOrientCode {
                ASAE_FSDK_FOC_Age_0         = 0x1,
                ASAE_FSDK_FOC_Age_90        = 0x2,
```

```
                ASAE_FSDK_FOC_Age_270      = 0x3,
                ASAE_FSDK_FOC_Age_180      = 0x4,
                ASAE_FSDK_FOC_Age_30       = 0x5,
                ASAE_FSDK_FOC_Age_60       = 0x6,
                ASAE_FSDK_FOC_Age_120      = 0x7,
                ASAE_FSDK_FOC_Age_150      = 0x8,
                ASAE_FSDK_FOC_Age_210      = 0x9,
                ASAE_FSDK_FOC_Age_240      = 0xa,
                ASAE_FSDK_FOC_Age_300      = 0xb,
                ASAE_FSDK_FOC_Age_330      = 0xc
};
```

成员变量

ASAE_FSDK_FOC_Age_0	0 度
ASAE_FSDK_FOC_Age_90	90 度
ASAE_FSDK_FOC_Age_270	270 度
ASAE_FSDK_FOC_Age_180	180 度
ASAE_FSDK_FOC_Age_30	30 度
ASAE_FSDK_FOC_Age_60	60 度
ASAE_FSDK_FOC_Age_120	120 度
ASAE_FSDK_FOC_Age_150	150 度
ASAE_FSDK_FOC_Age_210	210 度
ASAE_FSDK_FOC_Age_240	240 度
ASAE_FSDK_FOC_Age_300	300 度
ASAE_FSDK_FOC_Age_330	330 度

2.3.2. 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

Chapter 3: API 说明

3.1. ASAE_FSDK_InitAgeEngine

原型

```
MRESULT ASAE_FSDK_InitAgeEngine (
	MPChar			AppId,
	MPChar			SDKKey,
	MByte			*pMem,
	MInt32			lMemSize
	MHandle			*phEngine
);
```

描述

初始化年龄检测引擎

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
phEngine	[out]	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
MERR_NO_MEMORY	内存不足

3.2. ASAE_FSDK_AgeEstimation_StaticImage

原型

```
MRESULT ASAE_FSDK_AgeEstimation_StaticImage (
	MHandle				hEngine,
	LPASVLOFFSCREEN			pImginfo,
	LPASAE_FSDK_AGEFACEINPUT	pFaceRes,
	LPASAE_FSDK_AGERESULT		pAgeRes,
);
```

描述

检测静态图片中人物的年龄

参数

hEngine	[in]	引擎 handle
pImginfo	[in]	输入的图像数据
pFaceRes	[in]	已检测到的脸部信息
pAgeRes	[out]	年龄检测结果

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

3.3. ASAE_FSDK_AgeEstimation_Preview

原型

```
MRESULT ASAE_FSDK_AgeEstimation_Preview (
      MHandle                           hEngine,
      LPASVLOFFSCREEN                   pImginfo,
      LPASAE_FSDK_AGEFACEINPUT          pFaceRes,
      LPASAE_FSDK_AGERESULT             pAgeRes,
);
```

描述

检测动态视频中人物的年龄

参数

hEngine	[in]	引擎 handle
pImginfo	[in]	输入图像信息
pFaceRes	[in]	输入的图像中人脸信息， 需要事先用人脸引擎检测出
pAgeRes	[out]	年龄检测结果

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

3.4. ASAE_FSDK_UninitAgeEngine

原型

```
MRESULT ASAE_FSDK_UninitAgeEngine (
      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

3.5. ASAE_FSDK_GetVersion

原型

```
const ASAE_FSDK_Version* ASAE_FSDK_GetVersion(
      MHandle      hEngine
);
```

描述

获取 SDK 版本信息

参数

hEngine	[in]	引擎 handle

Chapter 4: Sample Codes

注意,使用时请替换申请的 **APPID SDKKEY**

```
#include <stdio.h>
#include "arcsoft_fsdk_age_estimation.h"
#include "merror.h"

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

#define MAXIMUM_FACE_NUMBER 10
#define WORKBUF_SIZE        (30*1024*1024)
#define APPID       ""                  //APPID
#define ASAE_SDKKey  ""                 //SDKKey

#define AGE_ESTIMATION_STATICIMAGE
#define AGE_ESTIMATION_PREVIEW

/* define global variables for age estimation */
MHandle                         AgeEngine = nullptr;
ASVLOFFSCREEN                   AgeImageInfo = { 0 };
ASAE_FSDK_AGEFACEINPUT          AgeFaceInput;
ASAE_FSDK_AGERESULT             AgeResult;
MByte *                         pWorkMem = nullptr;

/* initialize the engine and other variables */
MInt32 InitAgeEstimate()
{
	MInt32 res = MOK;
	AgeFaceInput.lFaceNumber = 0;
	AgeFaceInput.pFaceRectArray = new MRECT[MAXIMUM_FACE_NUMBER];
	if (0 == AgeFaceInput.pFaceRectArray)
		return MERR_NO_MEMORY;
	AgeFaceInput.pFaceOrientArray = new MInt32[MAXIMUM_FACE_NUMBER];
	if (0 == AgeFaceInput.pFaceOrientArray)
		return MERR_NO_MEMORY;

	pWorkMem = new MByte[WORKBUF_SIZE];
	res = ASAE_FSDK_InitAgeEngine(APPID, ASAE_SDKKey, pWorkMem, WORKBUF_SIZE,
&AgeEngine);
	return res;
}
/* release the engine and other memory handles */
MInt32 UnInitAgeEstimate()
{
	MInt32 res = MOK;
	res = ASAE_FSDK_UninitAgeEngine(AgeEngine);
	if (AgeFaceInput.pFaceRectArray != nullptr)
	{
		delete[] AgeFaceInput.pFaceRectArray;
		AgeFaceInput.pFaceRectArray = nullptr;
	}
	if (AgeFaceInput.pFaceOrientArray != nullptr)
	{
```

```
			delete[] AgeFaceInput.pFaceOrientArray;
			AgeFaceInput.pFaceOrientArray = nullptr;
		}
		if (pWorkMem != nullptr)
		{
			delete[] pWorkMem;
			pWorkMem = nullptr;
		}
		return res;
}
/* print sdk version */
void PrintVersionInfo()
{
		const ASAE_FSDK_Version * pVersionInfo = nullptr;
		pVersionInfo = ASAE_FSDK_GetVersion(AgeEngine);
		printf("%d %d %d %d\n", pVersionInfo->lCodebase, pVersionInfo->lMajor,
pVersionInfo->lMinor, pVersionInfo->lBuild);
		printf("%s\n", pVersionInfo->Version);
		printf("%s\n", pVersionInfo->BuildDate);
		printf("%s\n", pVersionInfo->CopyRight);
}

#ifdef AGE_ESTIMATION_STATICIMAGE
/* load static image and save it to "pImageInfo", which is a "ASVLOFFSCREEN"
struct. return "MOK" if succeed. */
MInt32 GetImageData(ASVLOFFSCREEN * pImageInfo)
{
		MInt32 res = MOK;

		/* load image. add your code here */
		/* ... ... */

		return res;
}

/* using ArcSoft face detection sdk to detect faces in the input image and save
the face results to "pFaceInput".
return "MOK" if succeed. */
MInt32 FaceDetect(ASVLOFFSCREEN * pImageInfo, ASAE_FSDK_AGEFACEINPUT * pFaceInput)
{
		MInt32 res = MOK;

		/* add your code here */
		/* ... ... */

		return res;
}
#endif


#ifdef AGE_ESTIMATION_PREVIEW
/* get each preview frame and save it to "pImageInfo", which is a "ASVLOFFSCREEN"
struct. return "MOK" if succeed. */
MInt32 GetPreviewData(ASVLOFFSCREEN * pImageInfo)
{
		MInt32 res = MOK;
```

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

	return res;
}

/* using ArcSoft face tracking library to detect faces in the input image and save
the face results to "pFaceInput".
return "MOK" if succeed. */
MInt32 FaceTrack(ASVLOFFSCREEN * pImageInfo, ASAE_FSDK_AGEFACEINPUT * pFaceInput)
{
	MInt32 res = MOK;

	/* add your code here */
	/* ... ... */

	return res;
}
#endif

/* estimate age  */
MInt32 AgeEstimate()
{
	MInt32 res = MOK;
#ifdef AGE_ESTIMATION_STATICIMAGE
	res = ASAE_FSDK_AgeEstimation_StaticImage(AgeEngine, &AgeImageInfo,
&AgeFaceInput, &AgeResult);
#endif

#ifdef AGE_ESTIMATION_PREVIEW
	res = ASAE_FSDK_AgeEstimation_Preview(AgeEngine, &AgeImageInfo,
&AgeFaceInput, &AgeResult);
#endif

	return res;
}

int main()
{
	/* initialize the engine and other variables */
	MRESULT nRet = MERR_UNKNOWN;
	nRet = InitAgeEstimate();
	if (nRet != MOK)
	{
		printf("InitAgeEngine failed , errorcode is %d \n", nRet);
		return -1;
	}

	/* print version info */
	PrintVersionInfo();

#ifdef AGE_ESTIMATION_STATICIMAGE
	/* image data acquisition */
	nRet = GetImageData(&AgeImageInfo);
	if (nRet != MOK)
	{
		printf("GetImageData: nRet=%d\n", nRet);
```

```
            return nRet;
        }

        /* face detection */
        nRet = FaceDetect(&AgeImageInfo, &AgeFaceInput);
        if (nRet != MOK)
        {
            printf("FaceDetect: nRet=%d\n", nRet);
            return nRet;
        }

        /* do age estimation when the face number is bigger than 0. */
        if (AgeFaceInput.lFaceNumber > 0)
        {
            /* age estimation */
            nRet = AgeEstimate();
            if (nRet != MOK)
            {
                printf("AgeEstimate: nRet=%d\n", nRet);
                return nRet;
            }

            /* print age estimation result */
            for (int i = 0; i < AgeFaceInput.lFaceNumber; i++)
            {
                printf("Age: %d, ", AgeResult.pAgeResultArray[i]);
            }
            printf("\n");
        }
#endif

#ifdef AGE_ESTIMATION_PREVIEW
        /* preview data acquisition */
        while (MOK == GetPreviewData(&AgeImageInfo))
        {
            /* face tracking */
            nRet = FaceTrack(&AgeImageInfo, &AgeFaceInput);
            if (nRet != MOK)
            {
                printf("FaceDetect: nRet=%d\n", nRet);
                return nRet;
            }

            /* age estimation */
            /* no matter "AgeFaceInput->lFaceNumber" is greater than or equal to
0, next sentence must be excuted. */
            nRet = AgeEstimate();
            if (nRet != MOK)
            {
                printf("AgeEstimate: nRet=%d\n", nRet);
                return nRet;
            }

            /* print age estimation result */
            if (AgeFaceInput.lFaceNumber > 0)
            {
                for (int i = 0; i < AgeFaceInput.lFaceNumber; i++)
```

```
                    {
                        printf("Age: %d, ", AgeResult.pAgeResultArray[i]);
                    }
                    printf("\n");
                }
        }
#endif

        /* release the engine and other memory handles */
        nRet = UnInitAgeEstimate();
        return nRet;
}
```