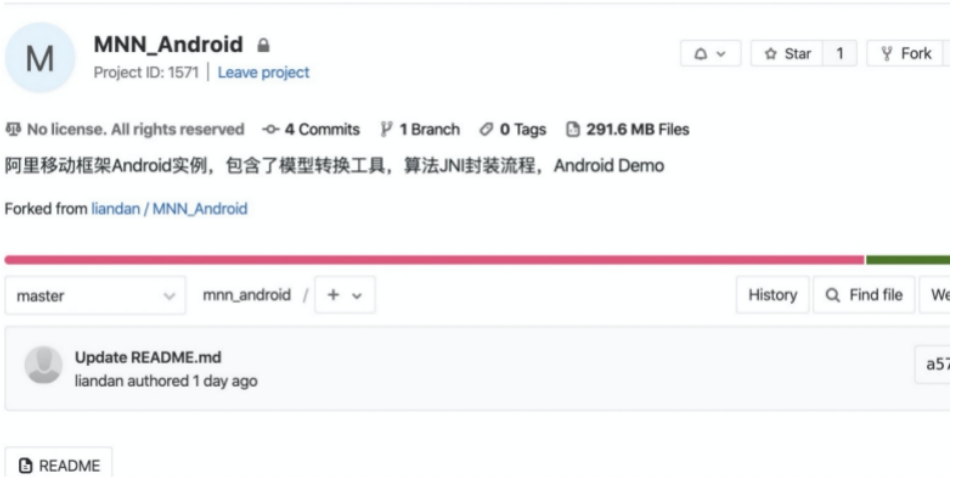
MNN 官方github：https://github.com/alibaba/MNN

MNN官方文档：https://www.yuque.com/mnn/cn

1、git clone 仓库到本地并解压

a) 地址：https://git.huanleguang.com/ai-dl/mnn_android



2、安装Android studio

a) 安装教程百度

3、配置NDK，用于 ndk-build

a) 官网（https://developer.android.google.cn/ndk/downloads/）下载NDK，本次使用版本15c

b) Ndk 路径写入环境变量（~/.bash_profile）,后source ~/.bash_profile

```
export ANDROID_NDK=/Users/shengdan/Downloads/android-ndk-r15c
#export ANDROID_NDK=/Users/shengdan/Downloads/android-ndk-r14b
export PATH=$ANDROID_NDK:$PATH
```

4、安装adb，用于放模型以及debug

a) 安装教程百度

5、MNN 模型转换

a) 在pc、服务器上将tf、caffe、pytorch模型转换成mnn模型

b) 编译转换教程见官网（https://www.yuque.com/mnn/cn/model_convert）

c) 打印mnn json 以及可视化，确保模型无问题

6、pc 命令行 adb将模型写入sdcard中

```
File sdcard = Environment.getExternalStorageDirectory();
String fileDir = sdcard.getAbsolutePath() + "/mnn_model";
// String fileDir =  "";
```

```
adb shell
cd sdcard
mkdir mnn_model
exit
adb push xxx.mnn /sdcard/mnn_model/
```

7、cpp and h

a) 参考./mnn_jni/jni/alg 封装自己的算法模块，记得修改mnn 名称一致

```
void UltraLightFastGenericGaceDetector1MB::load(const std::string &model_path, int num_thread)
{
    std::vector<std::string> tmpp = { model_path + "/Mb_Tiny_RFB_FD_train_input_320.mnn" };
    net.load_param(tmpp, num_thread);
}
```

8、删除原来./mnn_jni/libs ./mnn_jni/obj目录

9、修改完成后修改 Android.mk, 在/mnn_jni/jni 目录下执行ndk-build 命令，就可以在/mnn_jni/libs 下发现自己编译出来的so库了 如libMNN.so, libDetectMNN.so

```
LOCAL_PATH := $(call my-dir)

OpenCV_BASE = ../3rdlib/opencv-4.1
MNN_BASE    = ../3rdlib/mnn
NET_BASE = ./net_engine

MODULE_BASE = ./alg

include $(CLEAR_VARS)
LOCAL_MODULE := MNN
LOCAL_SRC_FILES := $(MNN_BASE)/libs/arm64-v8a/libMNN.so
include $(PREBUILT_SHARED_LIBRARY)


include $(CLEAR_VARS)

OpenCV_INSTALL_MODULES := on
OPENCV_LIB_TYPE := STATIC
include $(OpenCV_BASE)/sdk/native/jni/OpenCV.mk

$(warning "opencv include dir $(OPENCV_INCLUDE_DIR)")
LOCAL_C_INCLUDES += $(OPENCV_INCLUDE_DIR)
LOCAL_C_INCLUDES += $(MNN_BASE)/include
LOCAL_C_INCLUDES += $(NET_BASE)
LOCAL_C_INCLUDES += $(MODULE_BASE)/include

LOCAL_SRC_FILES :=      $(NET_BASE)/net.cpp\
                                $(MODULE_BASE)/src/Bbox.cpp\
                                $(MODULE_BASE)/src/mtcnn.cpp\
                                $(MODULE_BASE)/src/imgProcess.cpp
```

10、将/mnn_jni/libs 下编译出来的so库如libMNN.so, libDetectMNN.so 拷贝到Android 工程的libs目录，编译android 工程，最后在build/output下就可以看到apk

```
1  cp mnn_android/mnn_jni/libs/arm64-v8a/* mnn_android/mnn_mtcnn/android/app/libs/a
```