

QLS_AI_Tai

description:

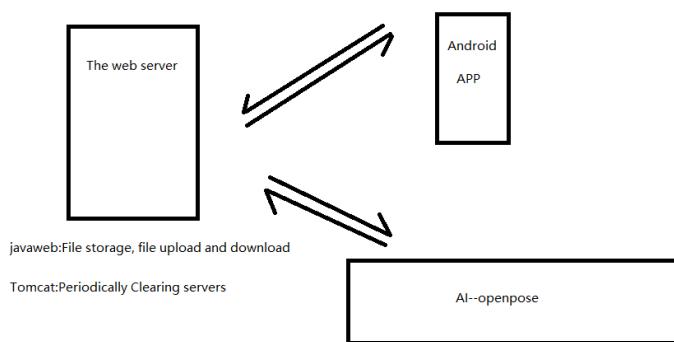
1. Project introduction:

This project is a posture detection APP built with Ai. The main technologies used are AI openpose posture detection, javaweb file upload and download, and Android OkHttp communication;

1.1 Technical icon:

The technical support structure of the project is as follows:

The test environment:
The service side: . The android: The development environment: The development tools:
windows 10 Android version: Android11 java JDK 1.8.0_131 Android studio Arctic Fox稳定版2020.3.1
Tomcat9.0.43 The test model: Redmik30Ultra Android SDK android11(R)API(30) IntelliJ IDEA 2021.1
MIUI12.5



2.environment configuration:

2.1 Java environment

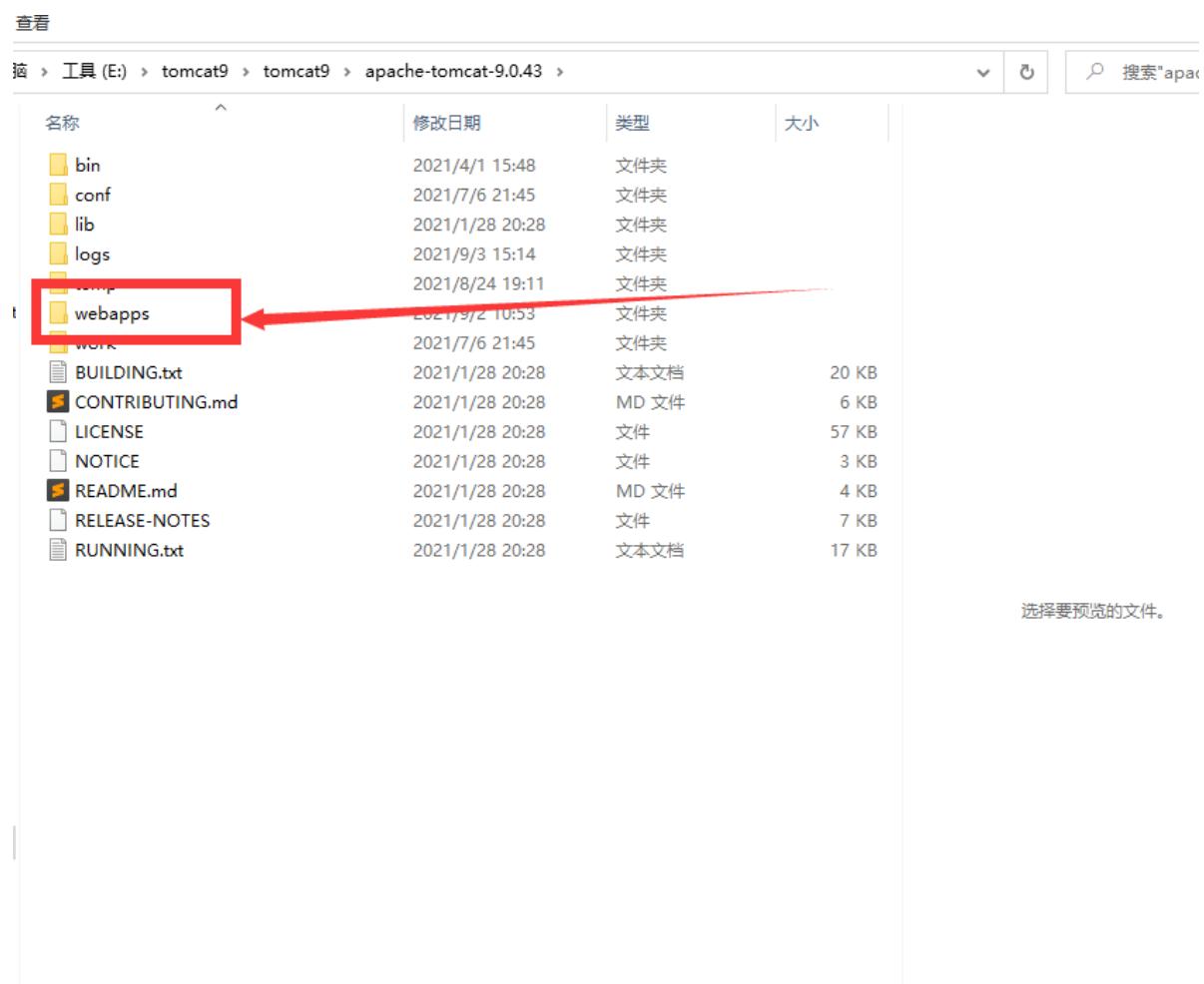
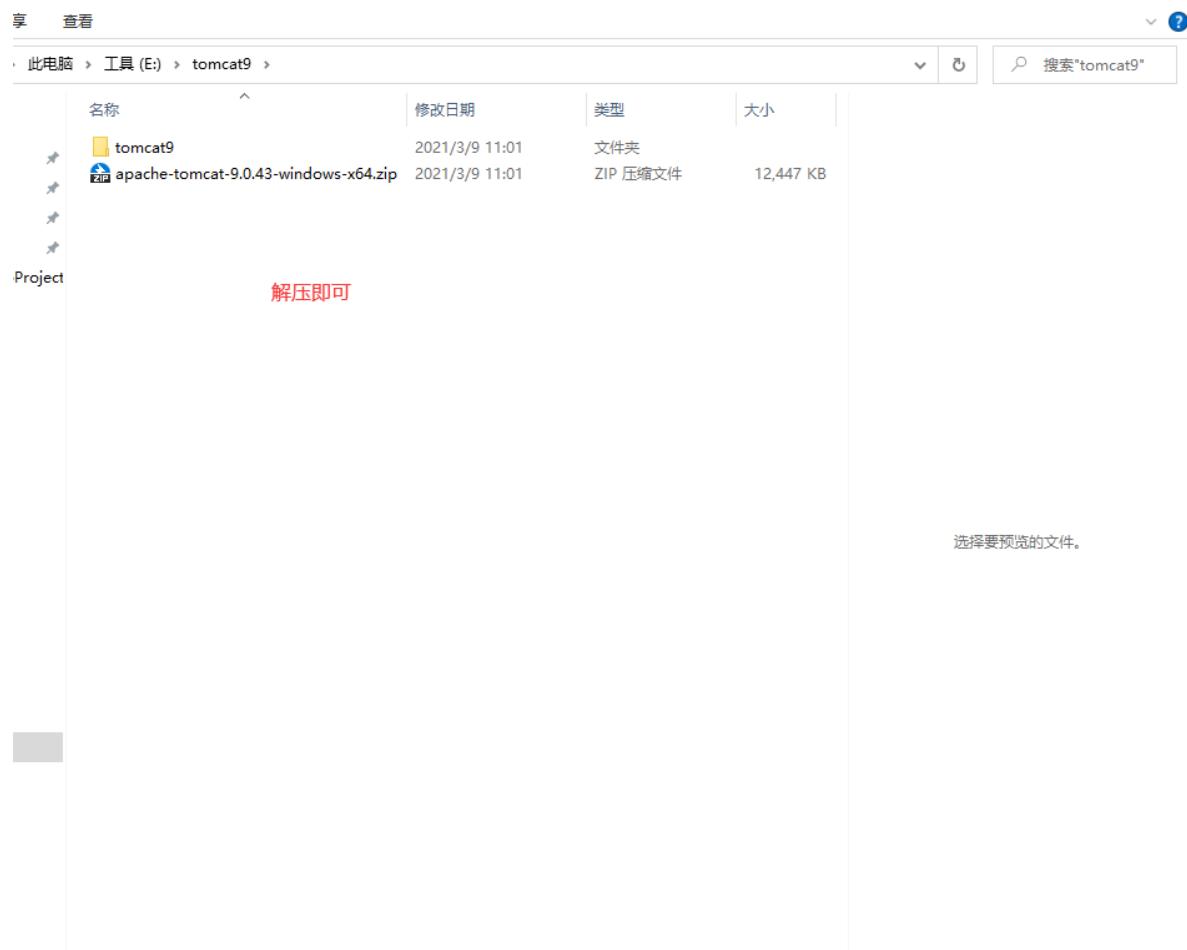
2.1.1 Download and install java JDK (there are many examples on the Internet)

You can refer to the following blog [Java JDK installation and configuration](#) [Li Xu's blog-CSDN blog](#) [java jdk installation](#)

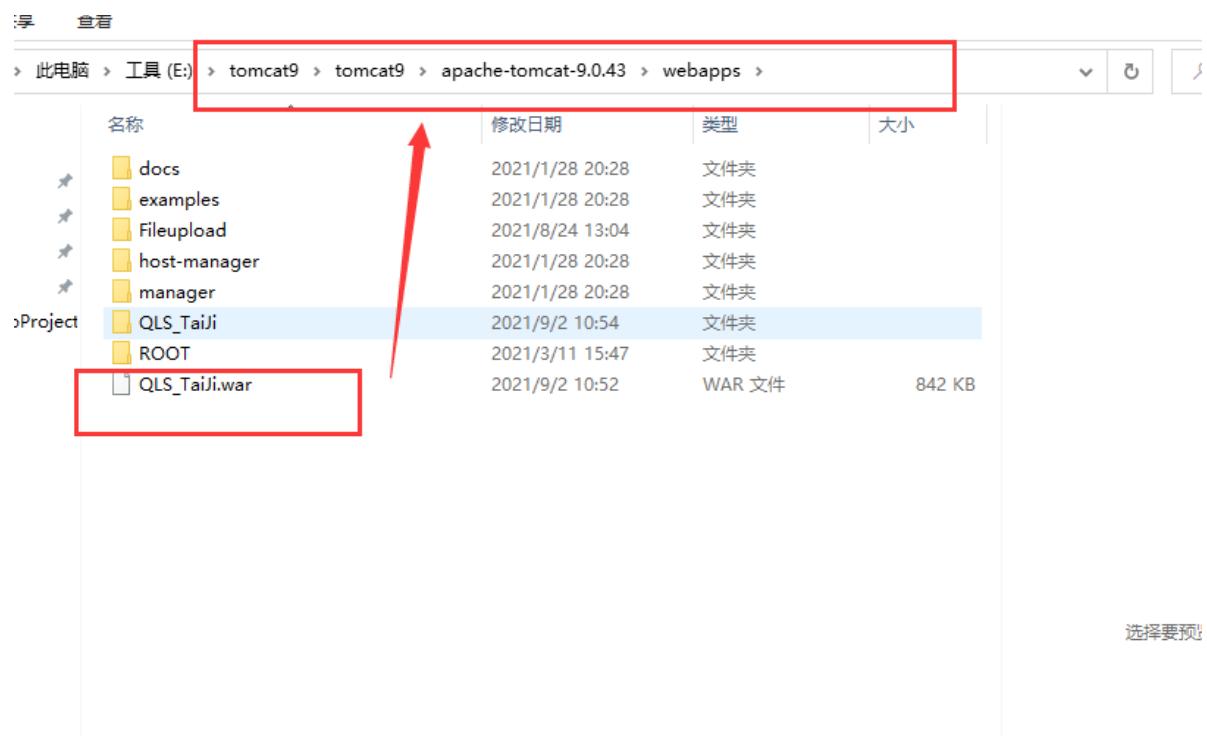
2.1.2 Install Tomcat server

Unzip

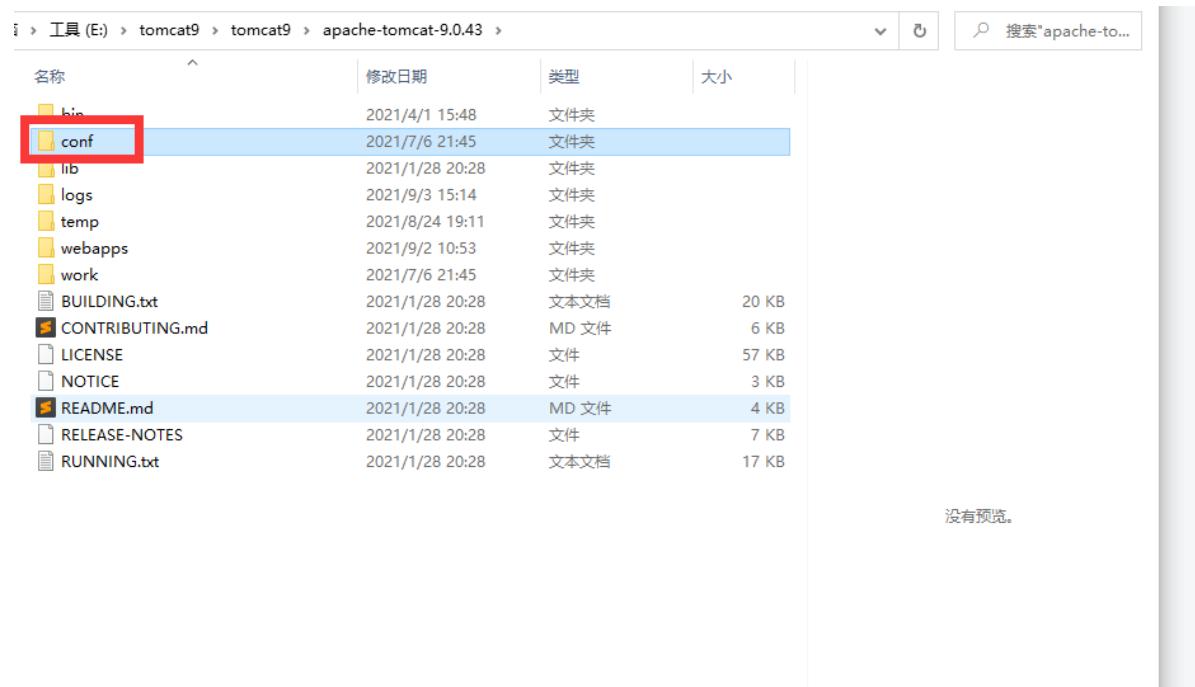
Configure the server



Download QLS_TaiJi.war and place this file in the webapps directory



Then configure in the conf directory



```
server.xml - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
Documentation at /docs/config/engine.html -->

<!-- You should set jvmRoute to support load-balancing via AJP ie :
<Engine name="Catalina" defaultHost="localhost" jvmRoute="jvm1">
-->
<Engine name="Catalina" defaultHost="localhost">

    <!--For clustering, please take a look at documentation at:
        /docs/cluster-howto.html (simple how to)
        /docs/config/cluster.html (reference documentation) -->
    <!--
    <Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"/>
-->

    <!-- Use the LockOutRealm to prevent attempts to guess user passwords
        via a brute-force attack -->
    <Realm className="org.apache.catalina.realm.LockOutRealm">
        <!-- This Realm uses the UserDatabase configured in the global JNDI
            resources under the key "UserDatabase". Any edits
            that are performed against this UserDatabase are immediately
            available for use by the Realm. -->
        <Realm className="org.apache.catalina.realm.UserDatabaseRealm"
            resourceName="UserDatabase"/>
    </Realm>

<Host name="localhost" appBase="webapps"
    unpackWARs="true" autoDeploy="true">
    <!-- SingleSignOn valve, share authentication between web applications
        Documentation at: /docs/config/valve.html -->
    <!--
    <Valve className="org.apache.catalina.authenticator.SingleSignOn" />
-->

    <Context docBase="QLS_TaiJi" path="/QLS_TaiJi" reloadable="true" />

    <!-- Access log processes all example.
        Documentation at: /docs/config/valve.html
        Note: The pattern used is equivalent to using pattern="common" -->
    <Valve className="org.apache.catalina.valves.AccessLogValve" directory="logs"
        prefix="localhost_access_log" suffix=".txt"
        pattern="%h %l %u %t \"%r\" %s %b" />

</Host>
</Engine>
</Service>
</Server>
```



So far, the server deployment is complete

2.2AI backend configuration

2.2.1 Download and install VS2015

There are many installation tutorials for VS2015 on the Internet, so I won't talk about it here.

2.2.2 Install CUDA 10.2

Check the driver version of the machine first: Open NVIDIA control panel -> System Information -> Components, and check the product name of NVCUDA.DLL in 3D settings. If the number is greater than 10.2, it means that the machine can directly install CUDA 10.2, if it is less, you need to upgrade the driver. Version cuda download page: <https://developer.nvidia.com/cuda-downloads>

The screenshot shows the NVIDIA Developer website's CUDA Toolkit Archive section. At the top, there are navigation links for SOLUTIONS, PLATFORMS, and RESOURCES. Below that, a breadcrumb trail shows the user is at the CUDA Toolkit Archive. The main content area displays a list of CUDA Toolkit releases, with CUDA Toolkit 10.2 (Nov 2019) highlighted with a red box. Other releases listed include 11.2.0 (Dec 2020), 11.1.1 (Oct 2020), 11.1.0 (Sept 2020), 11.0 Update1 (Aug 2020), 11.0 (May 2020), 10.2 (Nov 2019), 10.1 update2 (Aug 2019), 10.1 update1 (May 2019), 10.1 (Feb 2019), 10.0 (Sept 2018), 9.2 (May 2018), and 9.1 (Dec 2017). A link to learn more about CUDA Toolkit 11 is also present.

点击cuda10.2，然后选择下面选项并下载：

The screenshot shows the CUDA Toolkit 10.2 download page. It starts with a 'Select Target Platform' section where users can choose their operating system (Windows, Linux, Mac OSX), architecture (x86_64), version (10, 8.1, 7, Server 2019, Server 2016, Server 2012 R2), and installer type (exe [network], exe [local]). The 'x86_64' button is selected. Below this, a 'Download Installer for Windows 10 x86_64' section shows a 'Base Installer' option with a download link for 2.6 GB. Installation instructions are provided: '1. Double click cuda_10.2.89_441.22_win10.exe' and '2. Follow on-screen prompts'. A note at the bottom states that checksums and patches can be found in 'Installer Checksums' and provides links to the 'Installation Guide' and 'CUDA Quick Start Guide'.

After downloading, run the downloaded exe file, and continue until the next step:

NVIDIA CUDA

版本 10.2



系统检查

许可协议

选项

安装

结束

安装选项

精简(E) (推荐)

Installs all CUDA components and overwrites current Display Driver.

1

自定义(C) (高级)

Allows you to select the components you want to install.

备注：在安装过程中可能会出现闪烁。

2

后退(B)

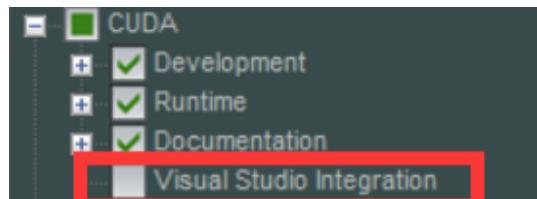
下一步(N)

取消(C)

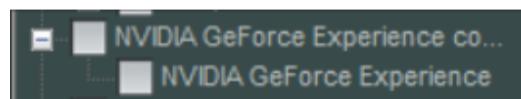
Choose custom installation here

★If the machine already has Visual Studio Integration files, uncheck it to avoid conflicts.

★Check if the machine does not have it!!!



取消勾选 NVIDIA GeForce Experience



点开Driver components，Display Driver这一行，前面显示的是CUDA新驱动版本。

- 如果本机当前驱动版本大于(新于) 新版本，要取消勾选。
- 如果本机当前驱动版本小于(旧于) 新版本，并且没有勾选，电脑可能会蓝屏或死机。
- 两个版本相同的话，可以勾选。
(虽然截图中当前版本没有显示，但我前面已经查看了本机cuda驱动版本，可以确定当前本机cuda版本是要旧于新版本的，要勾选。)



然后点击下一步等待安装完成即可

2.2.3 Check whether CUDA 10.2 is installed successfully:

In CMD, enter nvcc -V (with a space in between) and press Enter, the version number information of CUDA will be displayed, indicating that the installation is successful!

ps: If the result of the operation is that nvcc cannot be found,

Then add the bin directory where nvcc.exe is located to the system Path,

Method: Right-click this computer → Properties → Advanced System Settings → Environment Variables

2.2.4 Install anaconda <https://blog.csdn.net/yhgyn/article/details/82119201>

2.2.5 Configure Python environment Enter in CMD:

Then create a txt file requirements.txt and save the following code into the txt file. Enter it in the CMD under the txt file path:

```
pip install torch==1.9.0+cu102 torchvision==0.10.0+cu102 torchaudio==0.9.0 -f https://download.pytorch.org/wheel/torch\_stable.html
```

Then create a new txt file requirements.txt

Save the following code in a txt file

```

1 # pip install -r requirements.txt
2 # base -----
3 numpy
4 matplotlib
5 opencv-python
6 scipy
7 scikit-image
8 tqdm
9
```

Enter in the CMD under the txt file path:

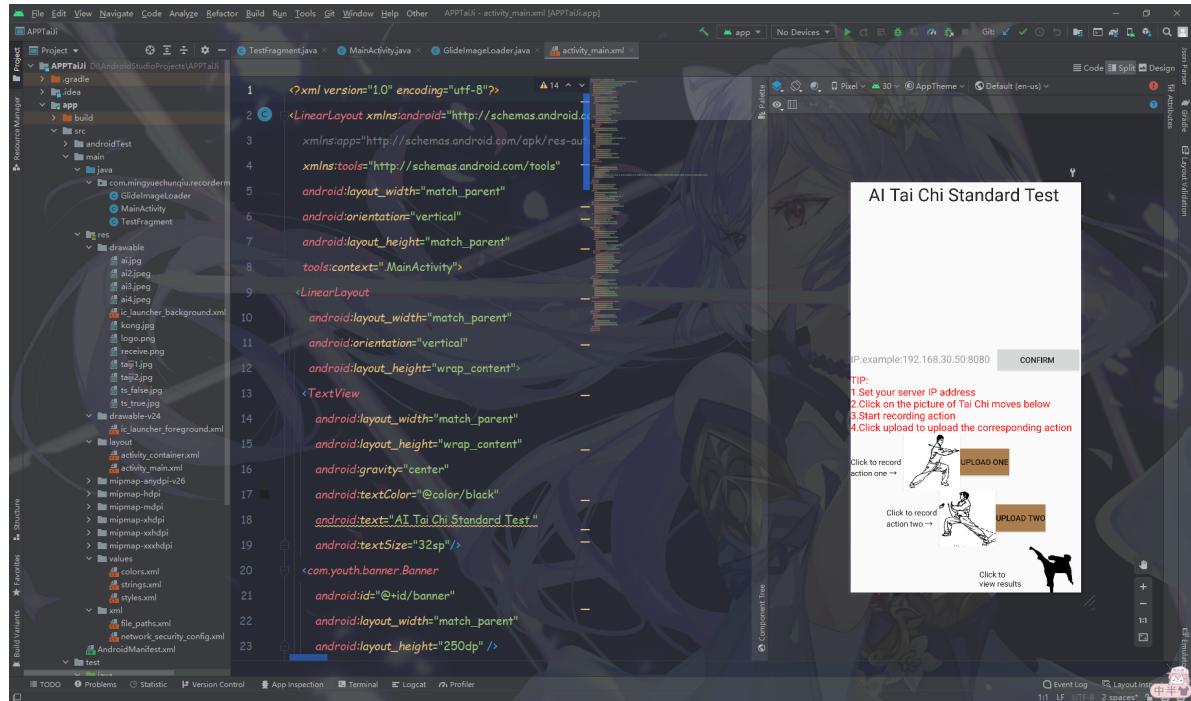
```
1 | python -m pip install -r requirements.txt --user
```

So far, the environment configuration is complete!

2.3 Android configuration

Android side

Import the project into Android Studio



3. use steps

3.1 Install the APK installation package of the APP

AI Tai Chi Standard Test



·30



图 4-31 ·



图 4-32

IP:example:192.168.20.50:8080

CONFIRM

TIP:

1. Set your server IP address
2. Click on the picture of Tai Chi moves below
3. Start recording action
4. Click upload to upload the corresponding action

Click to record
action one →



UPLOAD ONE

Click to record
action two →



UPLOAD TWO

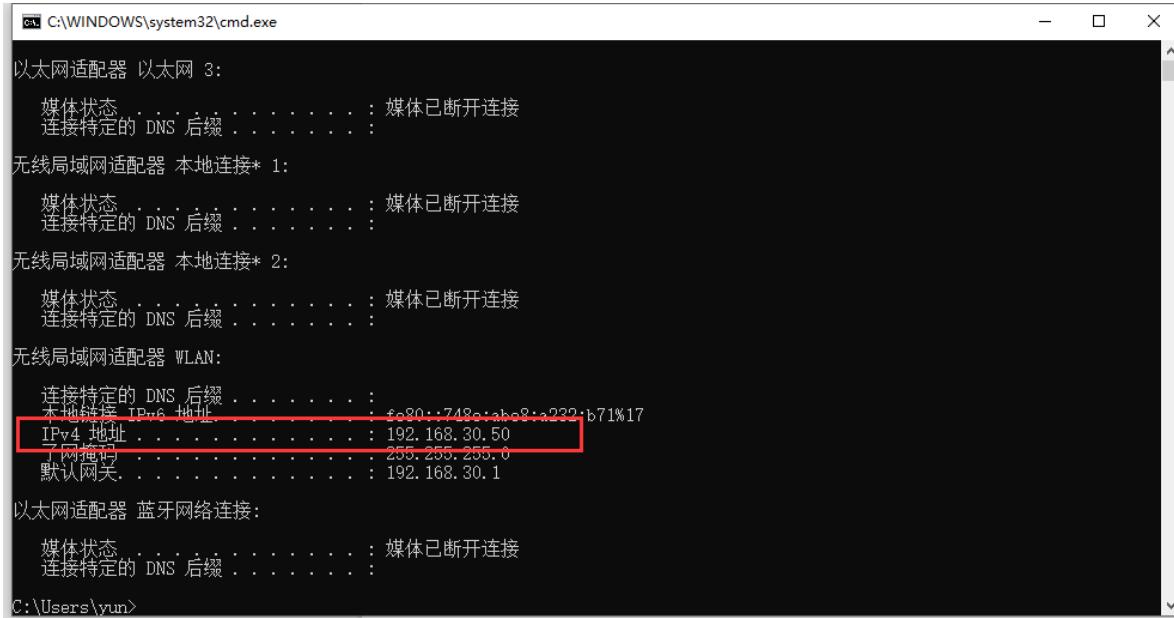
Click to
view results



3.2 Download the entire AI project folder to the local

3.3 View the IP and fill in the configuration file (the url of the hand-raising action video, the url of the bow-leg action and the upload url)

win+R enter cmd, enter IPconfig, copy your IP address, correspondingly modify the IP and port number in front of the URL



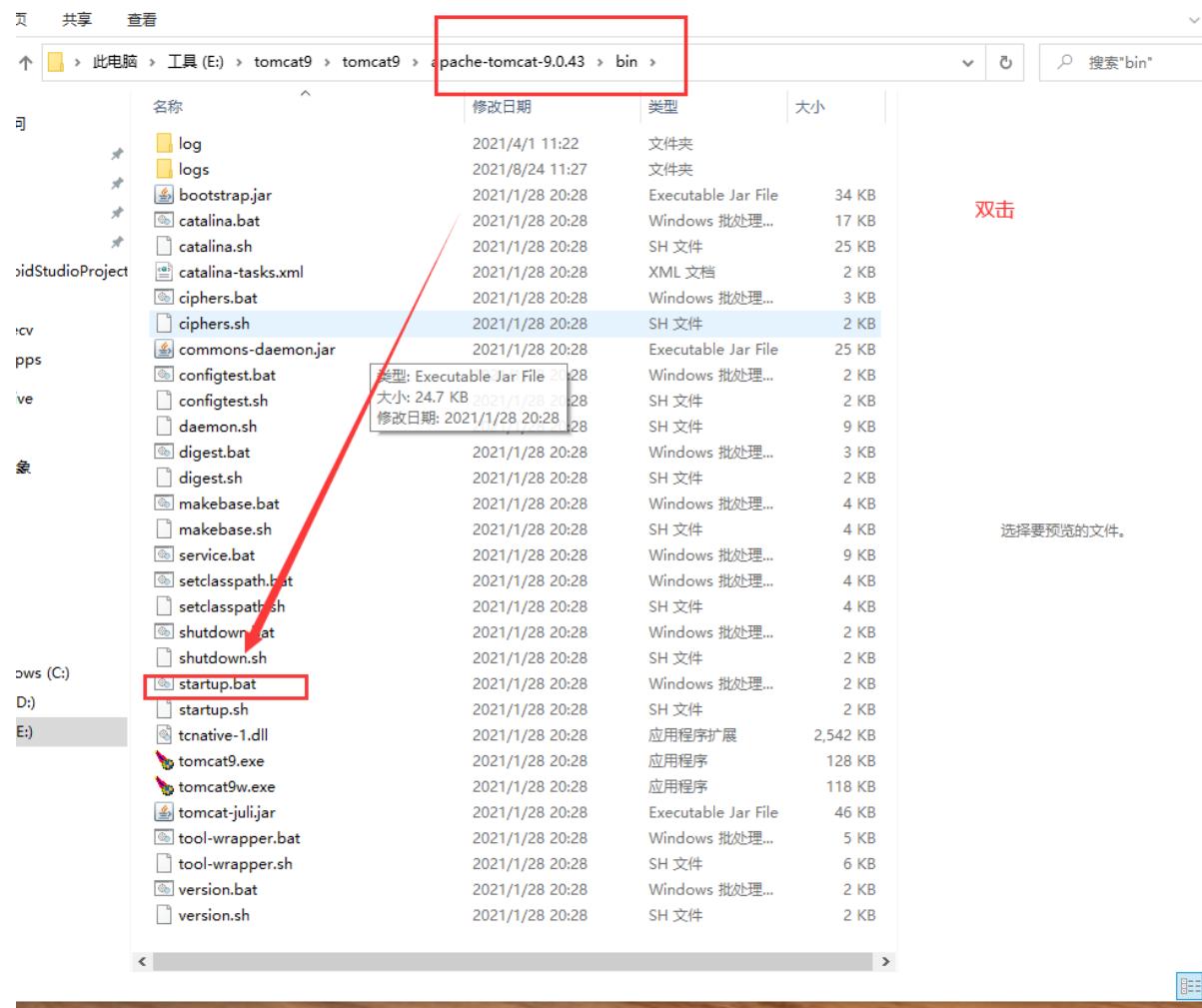
```
C:\WINDOWS\system32\cmd.exe
以太网适配器 以太网 3:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
无线局域网适配器 本地连接* 1:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
无线局域网适配器 本地连接* 2:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
无线局域网适配器 WLAN:
    连接特定的 DNS 后缀 : . . . . . :
        本地链接 IPv6 地址 : fe80::748c:abc8::232:b71%17
    [IPv4 地址 : . . . . . : 192.168.30.50]
    子网掩码 : . . . . . : 255.255.255.0
    默认网关 : . . . . . : 192.168.30.1
以太网适配器 蓝牙网络连接:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
C:\Users\yun>
```



```
C:\WINDOWS\system32\cmd.exe
以太网适配器 以太网 3:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
无线局域网适配器 本地连接* 1:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
无线局域网适配器 本地连接* 2:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
无线局域网适配器 WLAN:
    连接特定的 DNS 后缀 : . . . . . :
        本地链接 IPv6 地址 : fe80::748c:abc8::232:b71%17
    [IPv4 地址 : . . . . . : 192.168.30.50]
    子网掩码 : . . . . . : 255.255.255.0
    默认网关 : . . . . . : 192.168.30.1
以太网适配器 蓝牙网络连接:
    媒体状态 : . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 : . . . . . :
C:\Users\yun>
```

3.4 Start Tomacat

In the bin directory of the Tomcat unzip installation directory



3.4win+R enter cmd, cd to the project folder path, enter:

```
1 | python PoseEstimation.py
```

To run the project

4.matters needing attention

1. The IP custom port number must be filled in correctly
2. Click to confirm after setting the IP port number in the Android APP
3. The IP port number corresponding to the AI project URL must be modified
4. tomcat must be started first
5. Try to use your mobile phone to record video on the horizontal screen.
6. Only one person can appear in the screen
7. Ensure that all body parts of the person to be tested appear in the video



=====
= split line
line

[中文文档]

描述：

一款基于AI姿态检测的太极拳姿势识别APP

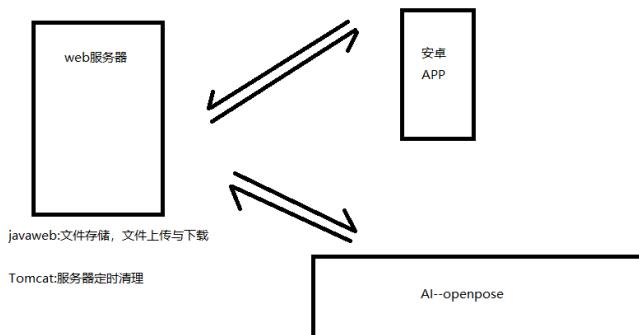
一、项目介绍：

本项目一款结合AI姿态检测的姿态检测APP，所使用到的主要技术是AI的openpose姿态检测，javaweb文件上传与下载，Android OkHttp通信；

1.1 技术图示：

项目技术支持架构如下：

测试环境：		开发环境：		开发工具
服务端	安卓端	java JDK 1.8.0_131	Android studio Arctic Fox稳定版2020.3.1	
windows 10 Tomcat9.0.43	Android版本：Android11 测试机型：RedmiK30Ultra MIUI12.5	Android SDK android11(R)API(30)	IntelliJ IDEA 2021.1	



二、环境配置：

2.1 Java环境

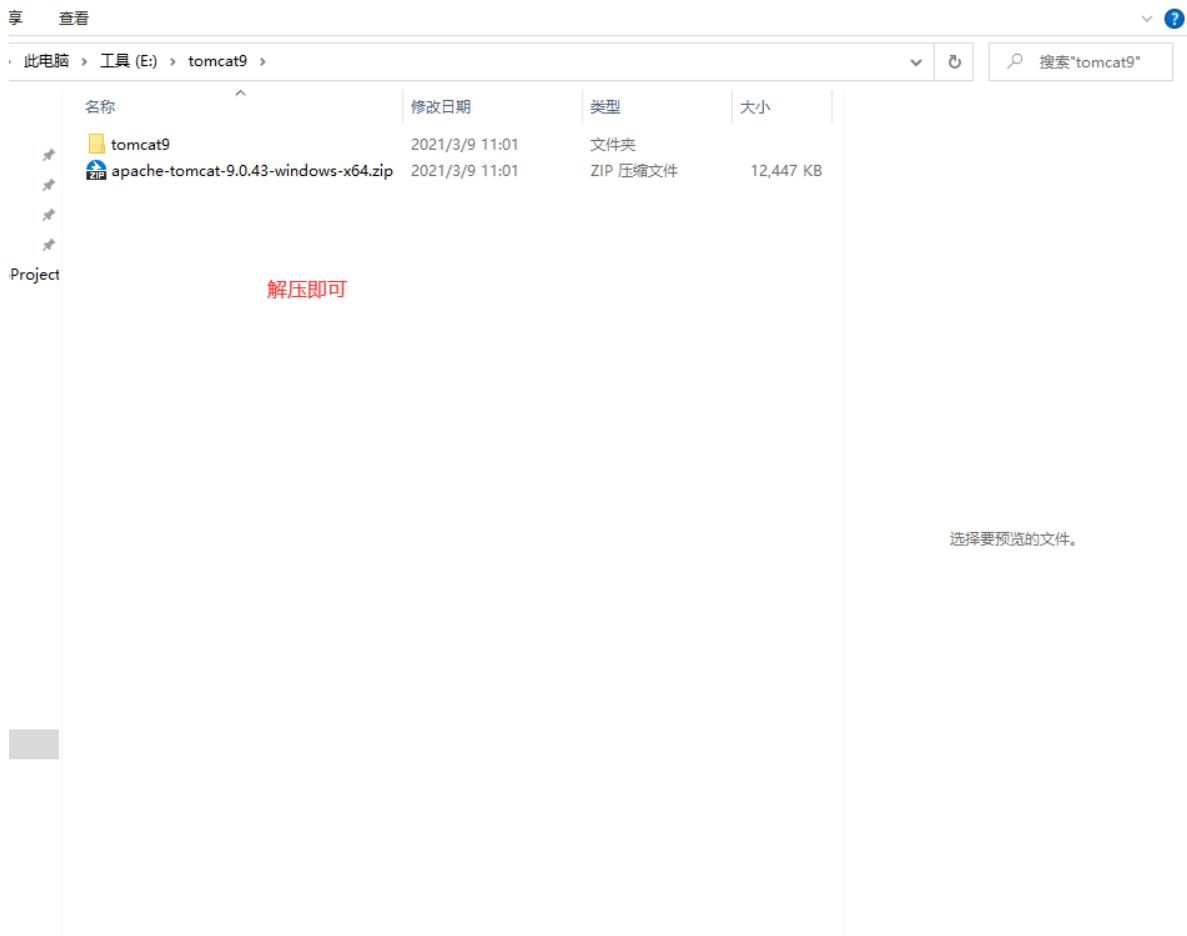
2.1.1 下载并安装Java JDK(这个在网上有很多例子)

可以参考以下博客[Java JDK安装与配置李旭的博客-CSDN博客java jdk安装](#)

2.1.2 安装Tomcat服务器

解压即可

配置服务器



查看

滴 > 工具 (E:) > tomcat9 > tomcat9 > apache-tomcat-9.0.43 >

名称 修改日期 类型 大小

名称	修改日期	类型	大小
bin	2021/4/1 15:48	文件夹	
conf	2021/7/6 21:45	文件夹	
lib	2021/1/28 20:28	文件夹	
logs	2021/9/3 15:14	文件夹	
temp	2021/8/24 19:11	文件夹	
webapps	2021/9/2 10:53	文件夹	
work	2021/7/6 21:45	文件夹	
BUILDING.txt	2021/1/28 20:28	文本文档	20 KB
CONTRIBUTING.md	2021/1/28 20:28	MD 文件	6 KB
LICENSE	2021/1/28 20:28	文件	57 KB
NOTICE	2021/1/28 20:28	文件	3 KB
README.md	2021/1/28 20:28	MD 文件	4 KB
RELEASE-NOTES	2021/1/28 20:28	文件	7 KB
RUNNING.txt	2021/1/28 20:28	文本文档	17 KB

选择要预览的文件。

下载QLS_TaiJi.war并将这个文件放在webapps目录下

此电脑 > 工具 (E:) > tomcat9 > tomcat9 > apache-tomcat-9.0.43 > webapps >

名称 修改日期 类型 大小

名称	修改日期	类型	大小
docs	2021/1/28 20:28	文件夹	
examples	2021/1/28 20:28	文件夹	
Fileupload	2021/8/24 13:04	文件夹	
host-manager	2021/1/28 20:28	文件夹	
manager	2021/1/28 20:28	文件夹	
QLS_TaiJi	2021/9/2 10:54	文件夹	
ROOT	2021/3/11 15:47	文件夹	
QLS_TaiJi.war	2021/9/2 10:52	WAR 文件	842 KB

选择要预览的文件。

随后在conf目录下配置

工具 (E:) > tomcat9 > tomcat9 > apache-tomcat-9.0.43 >

搜索 "apache-to..."

名称	修改日期	类型	大小
bin	2021/4/1 15:48	文件夹	
conf	2021/7/6 21:45	文件夹	
lib	2021/1/28 20:28	文件夹	
logs	2021/9/3 15:14	文件夹	
temp	2021/8/24 19:11	文件夹	
webapps	2021/9/2 10:53	文件夹	
work	2021/7/6 21:45	文件夹	
BUILDING.txt	2021/1/28 20:28	文本文档	20 KB
CONTRIBUTING.md	2021/1/28 20:28	MD 文件	6 KB
LICENSE	2021/1/28 20:28	文件	57 KB
NOTICE	2021/1/28 20:28	文件	3 KB
README.md	2021/1/28 20:28	MD 文件	4 KB
RELEASE-NOTES	2021/1/28 20:28	文件	7 KB
RUNNING.txt	2021/1/28 20:28	文本文档	17 KB

没有预览。

server.xml - 记事本

文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)

Documentation at /docs/config/engine.html -->

```
<!-- You should set jvmRoute to support load-balancing via AJP ie :  
<Engine name="Catalina" defaultHost="localhost" jvmRoute="jvm1">  
-->  
<Engine name="Catalina" defaultHost="localhost">  
  
    <!--For clustering, please take a look at documentation at:  
        /docs/cluster-howto.html (simple how to)  
        /docs/config/cluster.html (reference documentation) -->  
    <!--  
    <Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"/>  
    -->  
  
    <!-- Use the LockOutRealm to prevent attempts to guess user passwords  
        via a brute-force attack -->  
    <Realm className="org.apache.catalina.realm.LockOutRealm">  
        <!-- This Realm uses the UserDatabase configured in the global JNDI  
            resources under the key "UserDatabase". Any edits  
            that are performed against this UserDatabase are immediately  
            available for use by the Realm. -->  
        <Realm className="org.apache.catalina.realm.UserDatabaseRealm"  
            resourceName="UserDatabase"/>  
    </Realm>  
  
<Host name="localhost" appBase="webapps"  
    unpackWARs="true" autoDeploy="true">  
    <!-- SingleSignOn valve, share authentication between web applications  
        Documentation at: /docs/config/valve.html -->  
    <!--  
    <Valve className="org.apache.catalina.authenticator.SingleSignOn" />  
    -->  
  
        <Context docBase="QLS_TaiJi" path="/QLS_TaiJi" reloadable="true" />  
  
    <!-- Access log processes all example.  
        Documentation at: /docs/config/valve.html  
        Note: The pattern used is equivalent to using pattern="common" -->  
    <Valve className="org.apache.catalina.valves.AccessLogValve" directory="logs"  
        prefix="localhost_access_log" suffix=".txt"  
        pattern="%h %l %u %t "%r" %s %b" />  
  
    </Host>  
    </Engine>  
    </Service>  
</Server>
```



至此服务端部署完成

2.2AI后端配置

2.2.1 下载并安装VS2015

关于VS2015的安装教程，网上有很多，这里不多说了。

2.2.2 安装CUDA 10.2

先查看本机驱动版本： 打开NVIDIA控制面板 -> 系统信息->组件 在3D设置中查看NVCUDA.DLL的产品名称，如果数字大于10.2表示本机可以直接安装CUDA10.2，如果 小于则需要升级驱动版本 cuda下载页面：<https://developer.nvidia.com/cuda-downloads>



首页 > High Performance Computing > CUDA Toolkit > CUDA Toolkit Archive

CUDA Toolkit Archive

Previous releases of the CUDA Toolkit, GPU Computing SDK, documentation and developer drivers can be found using the links below. Please select the release you want from the list below, and be sure to check www.nvidia.com/drivers for more recent production drivers appropriate for your hardware configuration.

Latest Release

[Download Latest CUDA Toolkit](#)

[Learn More about CUDA Toolkit 11](#)

CUDA Toolkit 11.2.0 [Dec 2020], Versioned Online Documentation

Archived Releases

CUDA Toolkit 11.1.1 [Oct 2020], Versioned Online Documentation

CUDA Toolkit 11.1.0 [Sept 2020], Versioned Online Documentation

CUDA Toolkit 11.0 Update 1 [Aug 2020], Versioned Online Documentation

CUDA Toolkit 11.0 [May 2020], Versioned Online Documentation

CUDA Toolkit 10.2 [Nov 2019], Versioned Online Documentation

CUDA Toolkit 10.1 update2 [Aug 2019], Versioned Online Documentation

CUDA Toolkit 10.1 update1 [May 2019], Versioned Online Documentation

CUDA Toolkit 10.1 [Feb 2019], Online Documentation

CUDA Toolkit 10.0 [Sept 2018], Online Documentation

CUDA Toolkit 9.2 [May 2018], Online Documentation

CUDA Toolkit 9.1 [Dec 2017], Online Documentation

https://blog.cdn.netIT_xiao_guang_guang

点击cuda10.2，然后选择下面选项并下载：

Select Target Platform

Click on the green buttons that describe your target platform. Only supported platforms will be shown.

Operating System Windows Linux Mac OSX

Architecture x86_64

Version 10 8.1 7 Server 2019 Server 2016 Server 2012 R2

Installer Type exe [network] exe [local]

Download Installer for Windows 10 x86_64

The base installer is available for download below.

> Base Installer Download [2.6 GB]

Installation Instructions:

1. Double click cuda_10.2.89_441.22_win10.exe
2. Follow on-screen prompts

The checksums for the installer and patches can be found in [Installer Checksums](#).
For further information, see the [Installation Guide for Microsoft Windows](#) and the [CUDA Quick Start Guide](#).

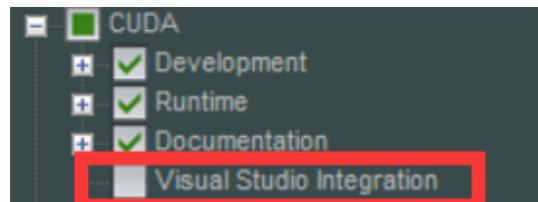
下载完后运行下载好的exe文件，一直下一步直至：



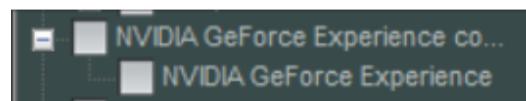
这里选择自定义安装

★如果本机已经有了 Visual Studio Integration 文件，要取消勾选，避免冲突了。

★如果本机没有的话，要勾选！！！



取消勾选 NVIDIA GeForce Experience



点开Driver components，Display Driver这一行，前面显示的是CUDA新驱动版本。

- 如果本机当前驱动版本大于(新于) 新版本，要取消勾选。
- 如果本机当前驱动版本小于(旧于) 新版本，并且没有勾选，电脑可能会蓝屏或死机。
- 两个版本相同的话，可以勾选。
(虽然截图中当前版本没有显示，但我前面已经查看了本机cuda驱动版本，可以确定当前本机cuda版本是要旧于新版本的，要勾选。)



然后点击下一步等待安装完成即可

2.2.3检测CUDA 10.2是否安装成功：

在CMD中，输入 nvcc -V (中间有空格)后，按回车，会显示CUDA的版本号信息，表明安装成功！

ps：如果运行结果是找不到nvcc，

那就把 nvcc.exe 所在的bin目录加入到系统 Path 里，

方法：右键 此电脑 → 属性 → 高级系统设置 → 环境变量

2.2.4安装anaconda <https://blog.csdn.net/ychgynn/article/details/82119201>

2.2.5配置Python环境 在CMD中输入：

然后新建一个txt文件requirements.txt 将下面代码存入txt文件中 在txt文件路径下的CMD中输入：

```
pip install torch==1.9.0+cu102 torchvision==0.10.0+cu102 torchaudio==0.9.0 -f https://download.pytorch.org/whl/torch\_stable.html
```

然后新建一个txt文件requirements.txt

将下面代码存入txt文件中

```
1 # pip install -r requirements.txt
2 # base -----
3 numpy
4 matplotlib
5 opencv-python
6 scipy
7 scikit-image
8 tqdm
9
```

在txt文件路径下的CMD中输入：

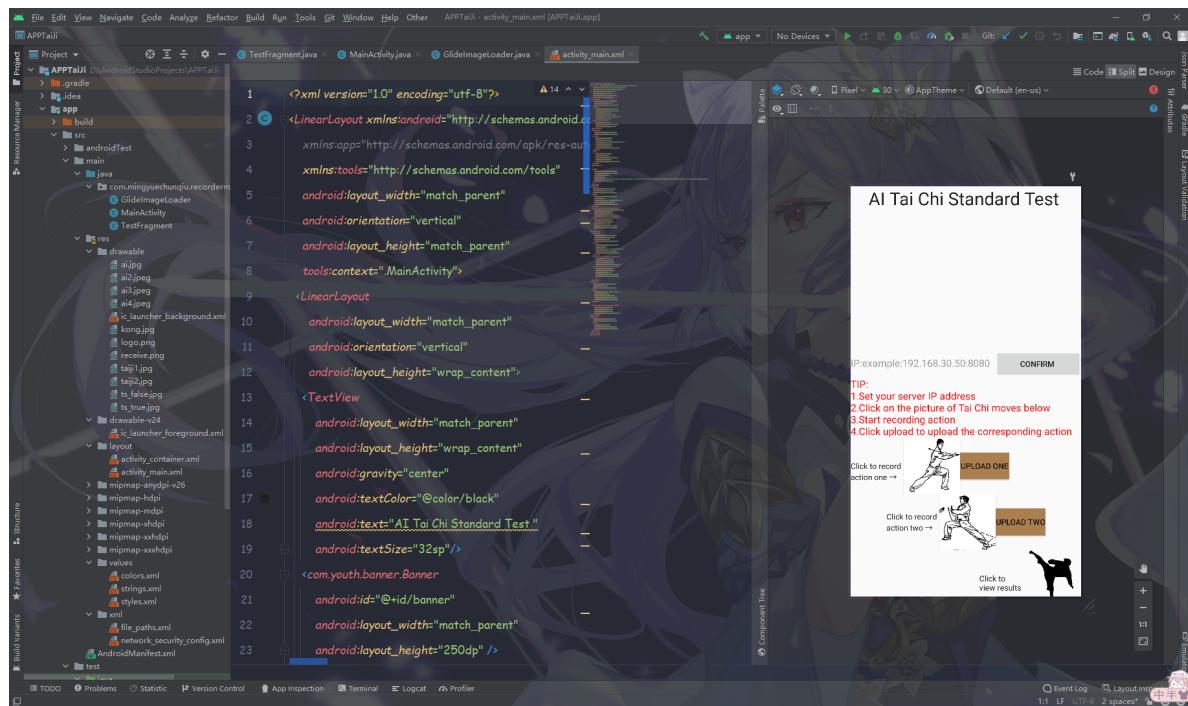
```
1 python -m pip install -r requirements.txt --user
```

至此环境配置完毕！

2.3 安卓配置

Android 端

将项目导入Android Studio即可



三、使用步骤

3.1 安装APP的APK安装包

AI Tai Chi Standard Test



·30



图 4-31 ·



图 4-32

IP:example:192.168.20.50:8080

CONFIRM

TIP:

1. Set your server IP address
2. Click on the picture of Tai Chi moves below
3. Start recording action
4. Click upload to upload the corresponding action

Click to record
action one →



UPLOAD ONE

Click to record
action two →



UPLOAD TWO

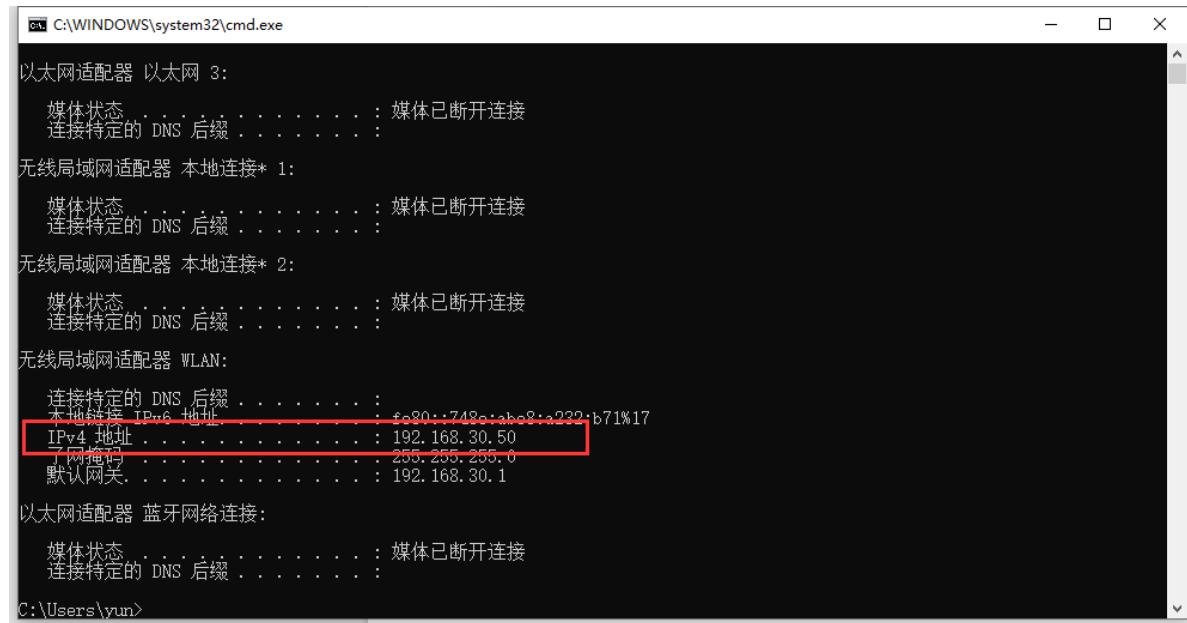
Click to
view results



3.2将整个AI项目文件夹下载到本地

3.3查看IP填写配置文件 (抬手动作视频的url、弓腿动作的url和上传url)

win+R 输入cmd，输入IPconfig,复制你的IP地址，对应修改URL前面的IP和端口号



```
C:\WINDOWS\system32\cmd.exe

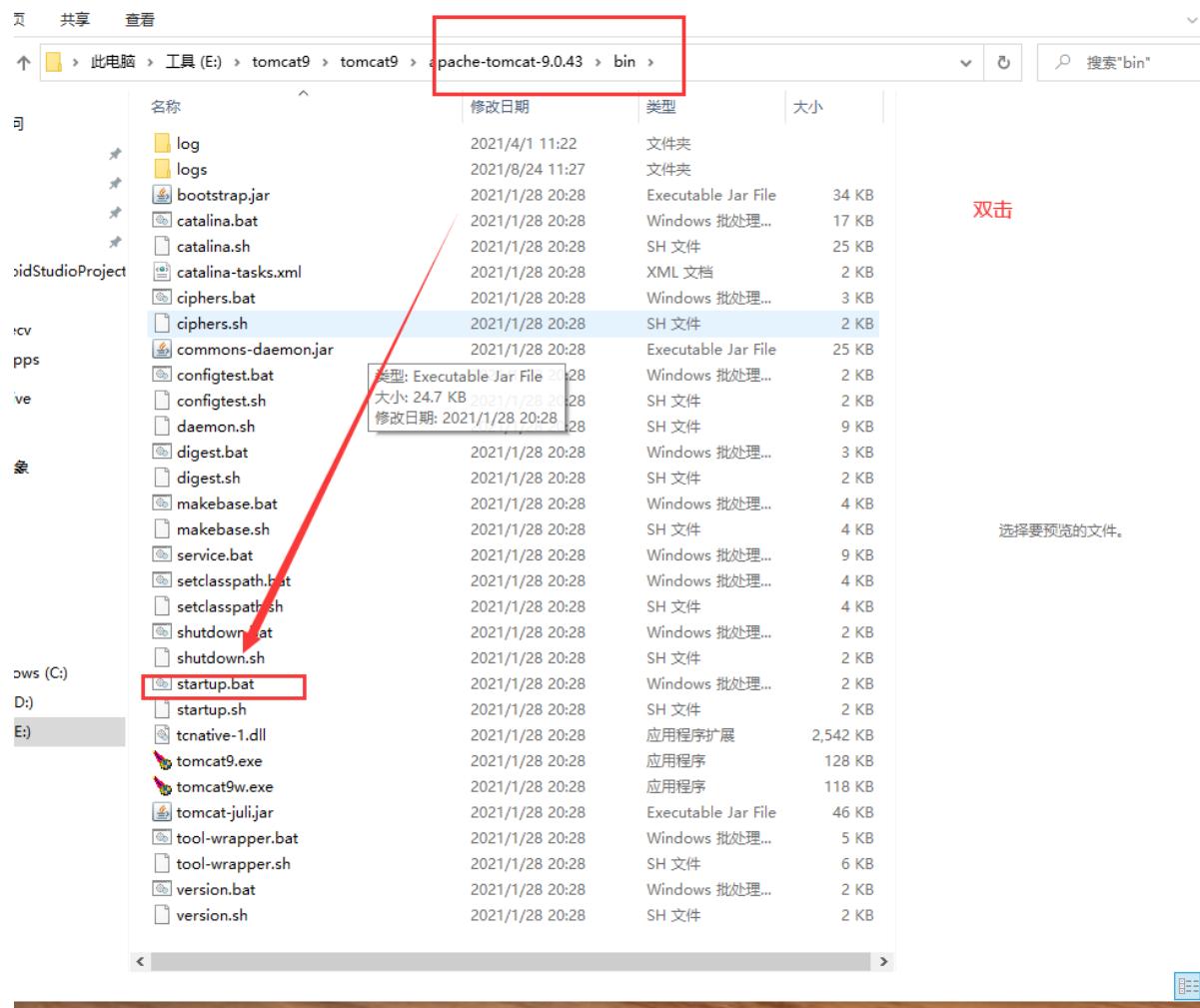
以太网适配器 以太网 3:
  媒体状态 . . . . . : 媒体已断开连接
  连接特定的 DNS 后缀 . . . . . :
  无线局域网适配器 本地连接* 1:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :
  无线局域网适配器 本地连接* 2:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :
  无线局域网适配器 WLAN:
    连接特定的 DNS 后缀 . . . . . :
    本地链接 IPv6 地址 . . . . . : fe80::748c:abc9::232:b71%17
    IPv4 地址 . . . . . : 192.168.30.50
    子网掩码 . . . . . : 255.255.255.0
    默认网关. . . . . : 192.168.30.1

以太网适配器 蓝牙网络连接:
  媒体状态 . . . . . : 媒体已断开连接
  连接特定的 DNS 后缀 . . . . . :

C:\Users\yun>
```

3.4启动Tomacat

在Tomcat解压安装目录的bin目录下



3.4 win+R 输入cmd， cd到项目文件夹路径下，输入：

```
1 | python PoseEstimation.py
```

便可运行该项目

四、注意事项

1. IP定制端口号务必填写正确
2. 安卓APP设置完IP端口号以后点击确认
3. AI项目URL对应IP端口号务必修改
4. tomcat务必先启动
5. 尽量使用手机横屏录制视频
6. 画面中只能出现一个人
7. 确保待测人身体全部部位都出现在视频中

