Machine Learning on Android: Software Installation

This document contains guidelines that will help you install and setup **Android Studio** and the **Neuroph Framework** which are the **necessary** tools for developing and running an android machine learning application on your device.

For both **Neuroph and Android Studio** you will need to download the Java Development Kit (JDK) from:

http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html

• Find the package that is compatible with your system.

• You will need to **accept** the license agreement to proceed with the download

• The installation process is simple and does not require any specific procedures. You can leave all default settings.

Java SE Development Kit 7u79

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

○ Accept License Agreement ◉ Decline License Agreement

Product / File Description	File Size	Download
Linux x86	130.4 MB	jdk-7u79-linux-i586.rpm
Linux x86	147.6 MB	jdk-7u79-linux-i586.tar.gz
Linux x64	131.69 MB	jdk-7u79-linux-x64.rpm
Linux x64	146.4 MB	jdk-7u79-linux-x64.tar.gz
Mac OS X x64	196.89 MB	jdk-7u79-macosx-x64.dmg
Solaris x86 (SVR4 package)	140.79 MB	jdk-7u79-solaris-i586.tar.Z
Solaris x86	96.66 MB	jdk-7u79-solaris-i586.tar.gz
Solaris x64 (SVR4 package)	24.67 MB	jdk-7u79-solaris-x64.tar.Z
Solaris x64	16.38 MB	jdk-7u79-solaris-x64.tar.gz
Solaris SPARC (SVR4 package)	140 MB	jdk-7u79-solaris-sparc.tar.Z
Solaris SPARC	99.4 MB	jdk-7u79-solaris-sparc.tar.gz
Solaris SPARC 64-bit (SVR4 package)	24 MB	jdk-7u79-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	18.4 MB	jdk-7u79-solaris-sparcv9.tar.gz
Windows x86	138.31 MB	jdk-7u79-windows-i586.exe
Windows x64	140.06 MB	jdk-7u79-windows-x64.exe

Prerequisites for Android Development

Install Android Studio

Download from: http://developer.android.com/sdk/index.html

• Locate the downloaded Android Studio installation executable file (named android-studio-bundle-.exe) in a Windows Explorer window and double click on it to start the installation process, clicking the Yes button in the User Account Control dialog if it appears. You can leave the default options.

• You will **need at least 4 GB of free space**. Also the installation time may vary depending on your internet connection.

• You may be notified to select the Java Development Kit (JDK) folder during the installation process. By default: C:\Program Files\Java\jdkX.X.X_XX

• Take not of the Android SDK Installation location. By default: C:\Users\<USERNAME>\AppData\Local\Android\sdk

• If you get an error regarding the failed installation of Intel HAXM technology you can safely ignore it.

Enabling On-device Developer Options

• To access these settings, open the *Developer options* in the system Settings. On Android 4.2 and higher, the Developer options screen is hidden by default. To make it visible, go to **Settings > About phone** and tap **Build number** seven times. Return to the previous screen to find Developer options at the bottom.

Enable USB debugging on your device

• On most devices running Android 3.2 or older, you can find the option under **Settings > Applications > Development**.

• On Android 4.0 and newer, it's in **Settings > Developer options**.

• Note: On Android 4.2 and newer, Developer options is hidden by default. To make it available, go to **Settings > About phone** and tap **Build number** seven times. Return to the previous screen to find **Developer options**.

• Enter **Developer options** and enable **USB Debugging.**

Set up your computer to detect your device

• If you're developing on Windows, you need to install a USB driver for adb. For an installation guide and links to OEM drivers, see the OEM USB Drivers (http://developer.android.com/tools/extras/oem-usb.html) document.

• Once you connect your device to a pc running windows the drivers should be automatically installed. If not then your device may not be properly interfacing with the computer. You should switch between **MTP** or **PTP** protocols to see which one is recognized by your computer. To select a **USB onnection** protocol, open the **Settings** app, tap Storage, tap the menu button, and tap**USB** computer **connection**. Alternatively and depending on your android version, pull down the top status bar, and then touch the **Connected as a media device** to see the other USB options.

Note: When you connect a device running Android 4.2.2 or higher to your computer, the system shows a dialog asking whether to accept an RSA key that allows debugging through this computer. This security mechanism protects user devices because it ensures that USB debugging and other adb commands cannot be executed unless you're able to unlock the device and acknowledge the dialog. This requires that you have adb version 1.0.31 (available with SDK Platform-tools r16.0.1 and higher) in order to debug on a device running Android 4.2.2 or higher.

Download a test example to your device

• Prior to downloading an application to your device you should allow installation of applications from sources other than Google Play Store. To do so go to **Settings > Security** and enable **Unknown sources.**

• The first time that Android Studio is launched a dialog will appear providing the option to import settings from a previous Android Studio version. If you have settings from a previous version and would like to import them into the latest installation, select the appropriate option and location. Alternatively, indicate that you do not need to import any previous settings and click on the **OK** button to proceed.

• When Android Studio is launched it may prompt you to check and download updates for components. After the updates are downloaded and installed you will be given a summary of installation location and components that were installed. Then the Android Studio is properly launched for the first time.

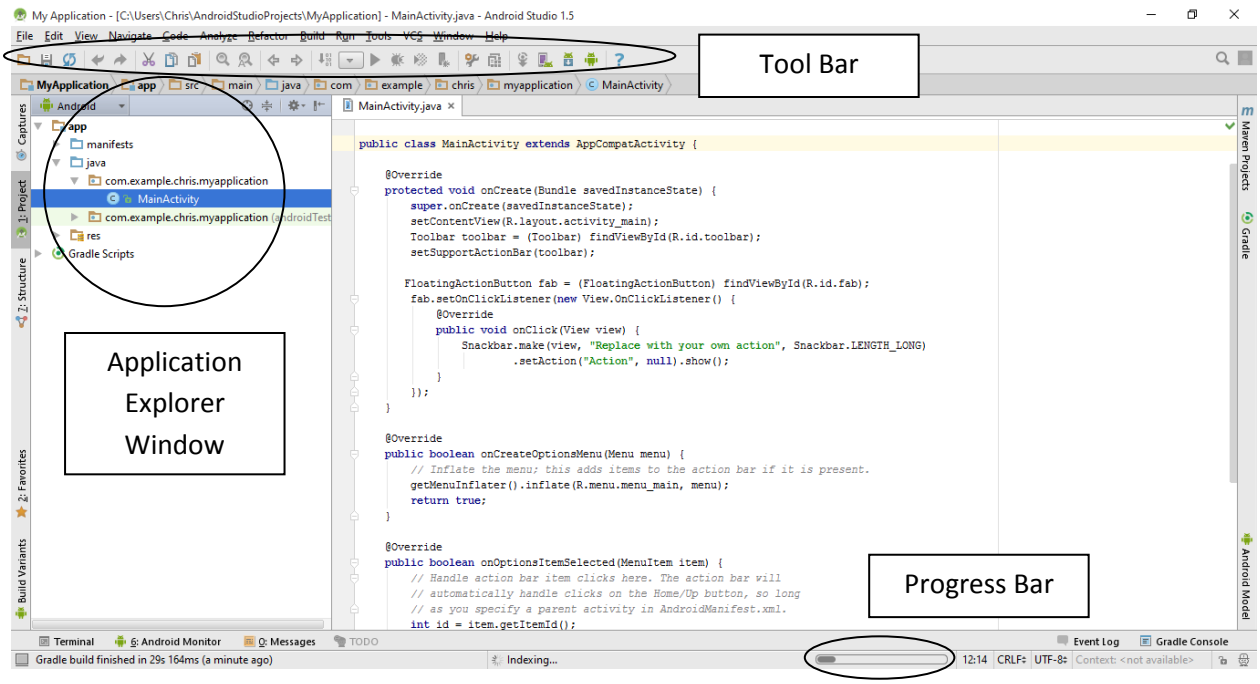
• To create a new project select **Start a new Android Studio Project**.

• A new window will appear where you will provide the application name, company name and project location. The other settings do not matter for now.

• The next step is to define the type of initial activity that is to be created for the application. A range of different activity types is available when developing Android applications.

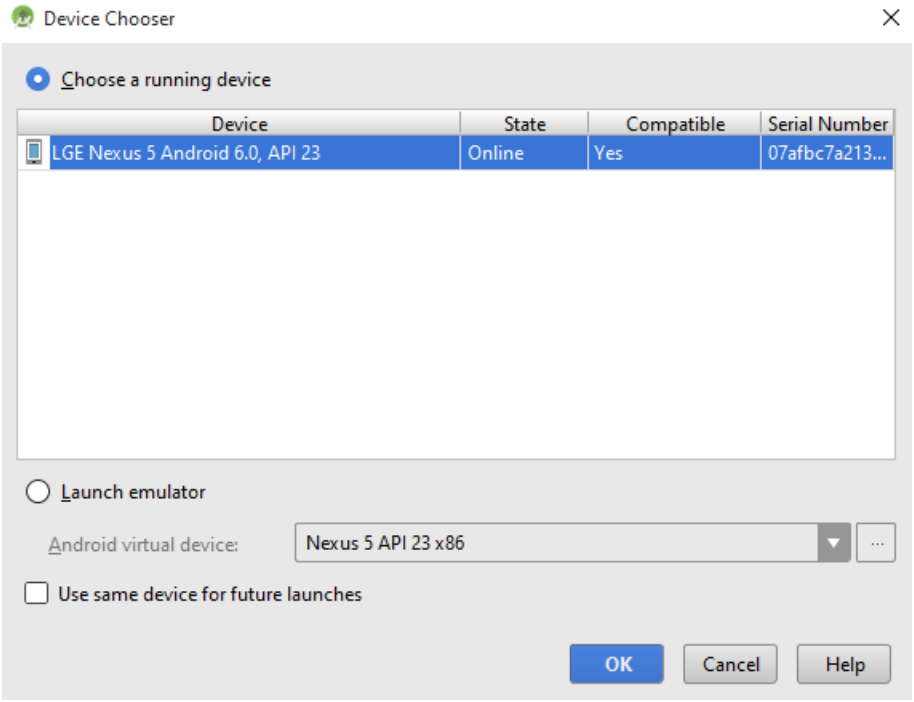
• With the **Blank Activity** option selected, click **Next**. On the final screen name the activity and title *AndroidSampleActivity*. The activity will consist of a single user interface screen layout which, for the purposes of this example, should be named *activity_android_sample* and with a menu resource named *menu_android_sample*. Click **Finish** to move to the next step.

• The project may take some time to load at the beginning. Notice the progress bar at the bottom of the screen. Once it is finished all the buttons in the upper tool bar will become active.

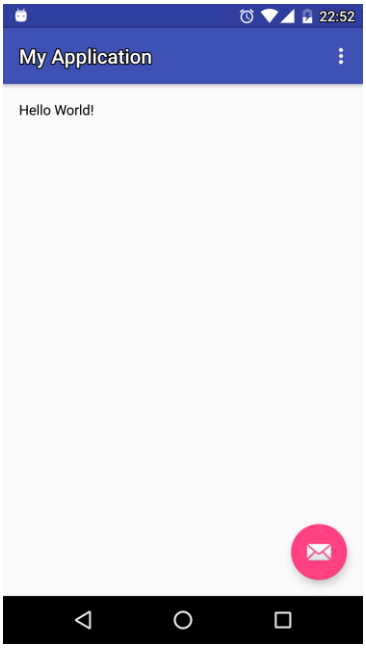


• To run the example project click **Run > Run 'app'**. A new dialog box will appear prompting you to select a device of your choice to run your application. Select a device as indicated in the figure. Click **OK** to run the app on your device.

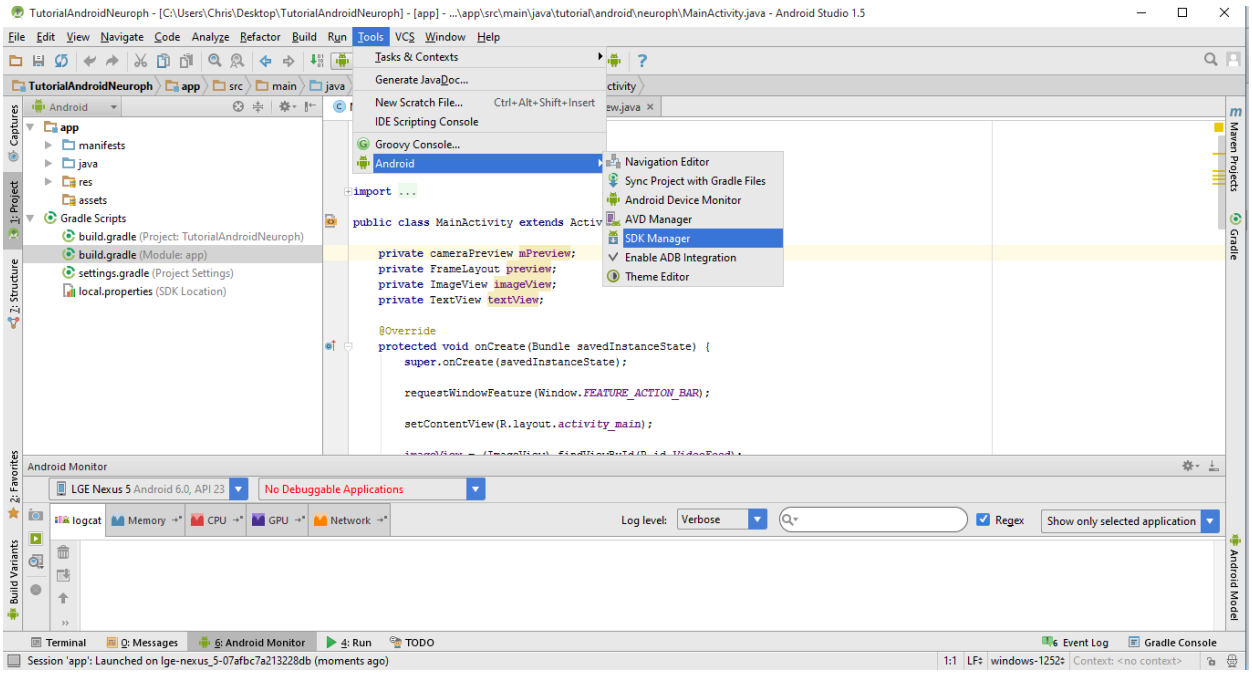
WARNING: The device will not appear if you have not configured it properly.

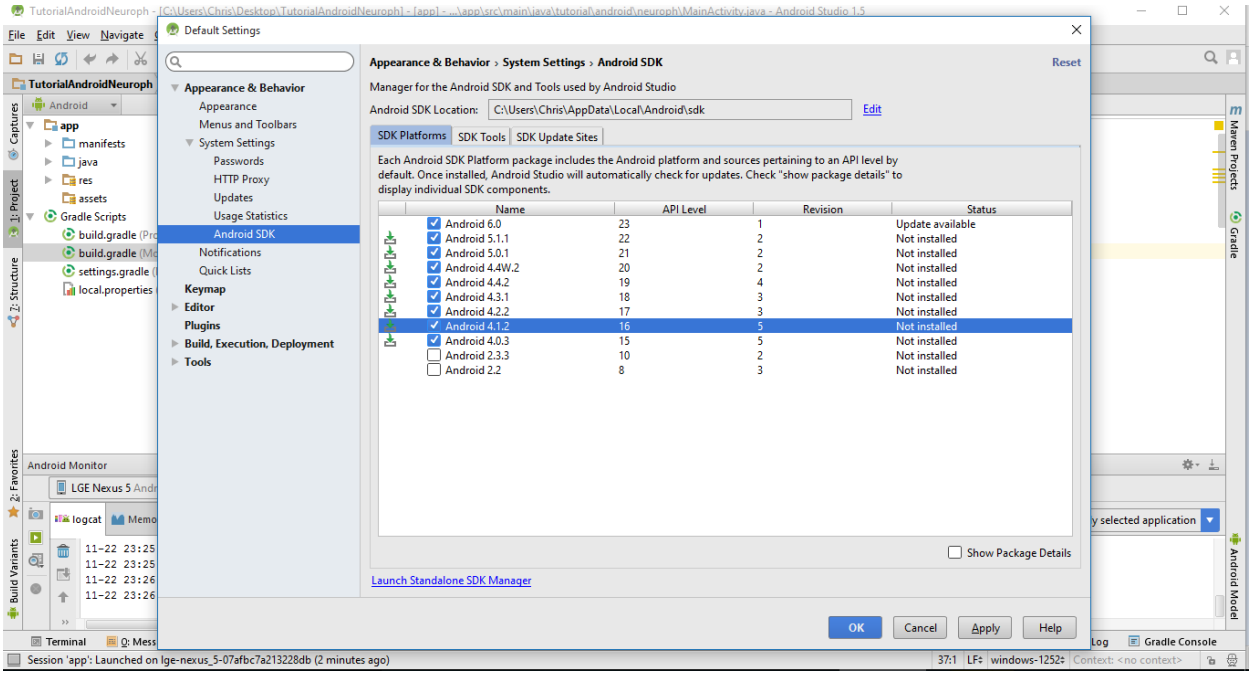


• Once the application package is installed successfully you should see the following screen on your device. This application just displays the Hello World message to make sure that everything is setup correctly. You can exit and uninstall this application.

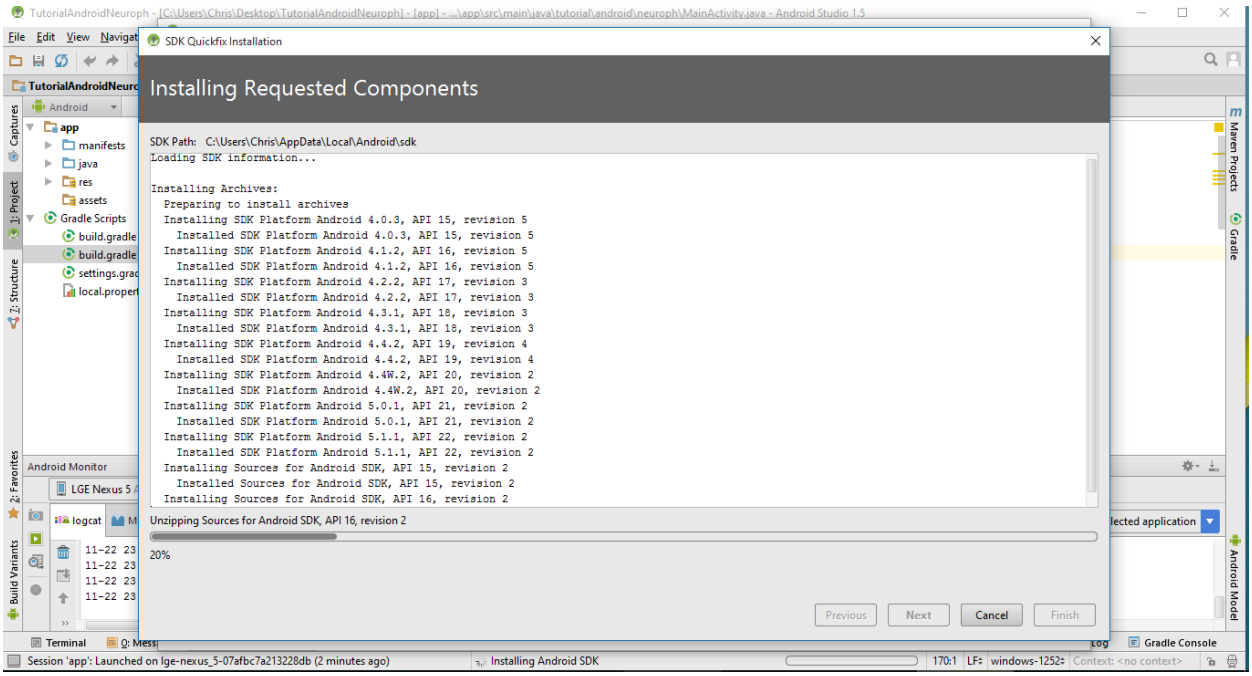


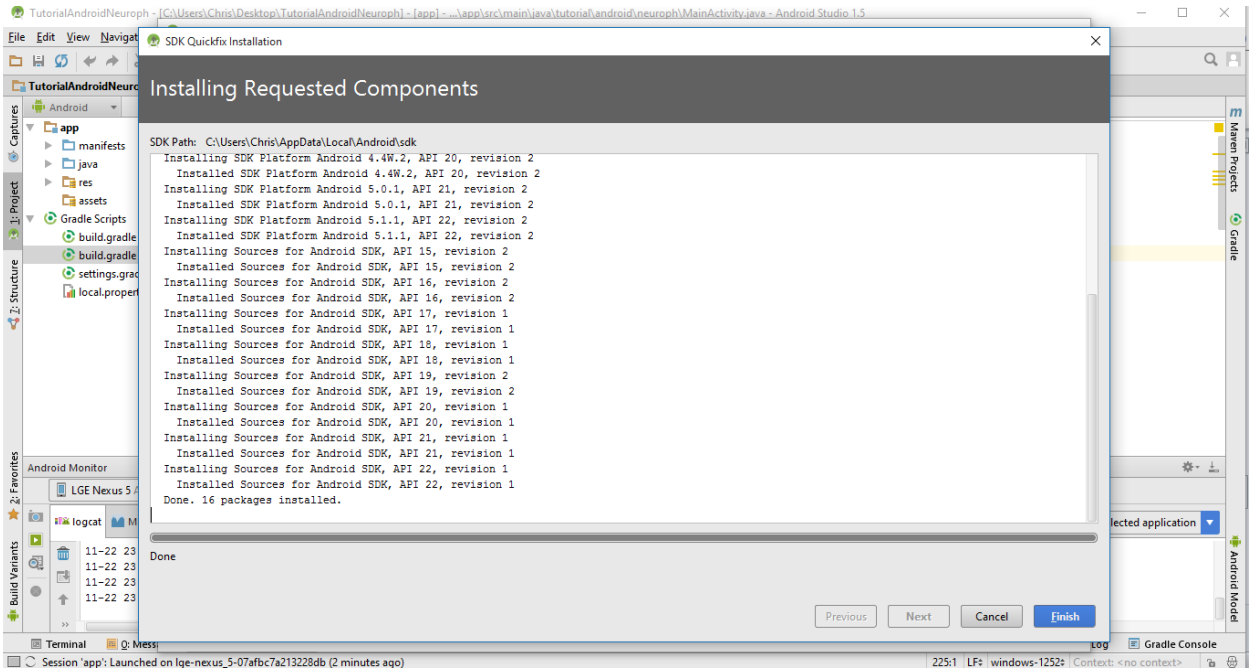
• In order to allow your applications to run on older versions of Android you will need to download the APIs of previous Android versions. To do so go to **Tools > Android > SDK Manager**. On the new window select for installation **API levels 15 to 22** and click **OK**. You will be notified for the additional components to be installed. Click **OK**.





• This is how your screen will look while all necessary components are downloaded and installed. This process may take between 20-30 minutes. After all packages are installed click **Finish**.





CONGRATULATIONS! You are now ready to become an Android Developer!

***For a more comprehensive guide have a look at:
http://www.ebookfrenzy.com/pdf_previews/AndroidStudioEssentialsPreview.pdf

Prerequisites for Neuroph Framework

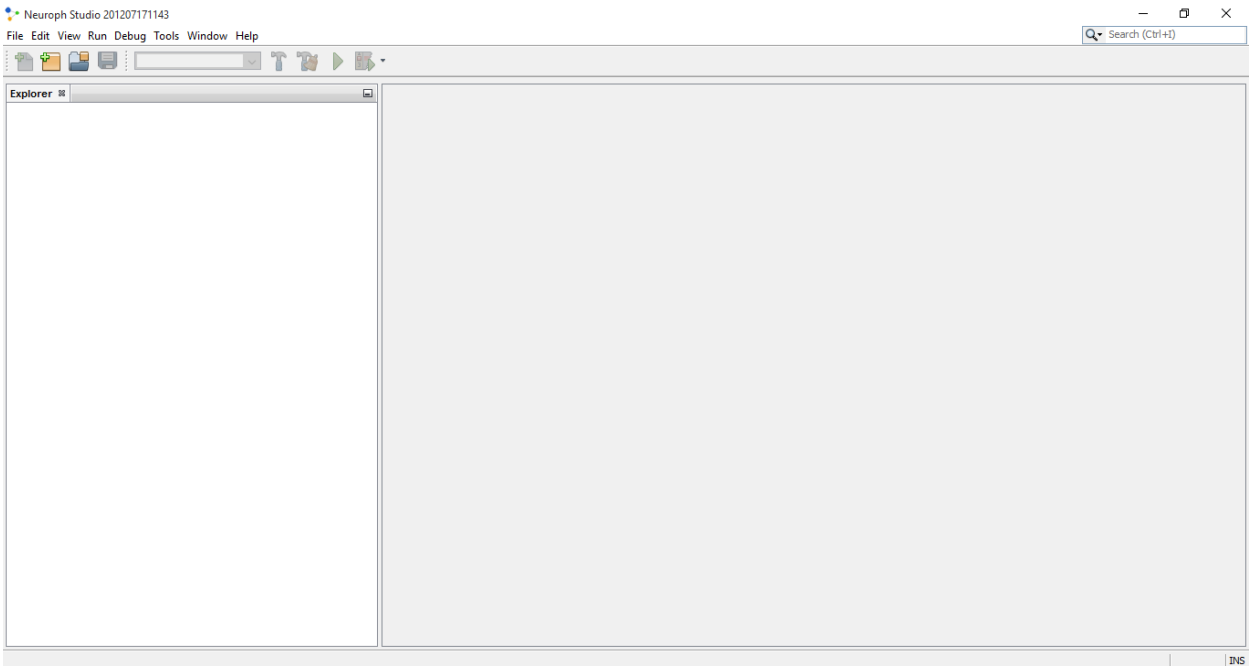
For this tutorial we will be using the **Neuroph Framework <u>version 2.6</u>** which you can download from:

http://sourceforge.net/projects/neuroph/files/neuroph%202.6/neurophstudio-windows-2.69.exe/download

Neuroph does not need any specific installation procedure. You can leave all default settings during the installation process.

Just unpack downloaded neuroph_xxx.zip where you want and use it. Or if you download the windows installer, install **Neuroph** to your preferred destination.

Once the installation is complete, run **Neuroph** to make sure that all components are installed. If everything is ok you should see a window as below.



You can familiarize yourself with **Neuroph** by going through these materials.

http://neuroph.sourceforge.net/image_recognition.html

http://neuroph.sourceforge.net/Getting%20Started%20with%20Neuroph%202.3.pdf