

Android Video Capture Tool

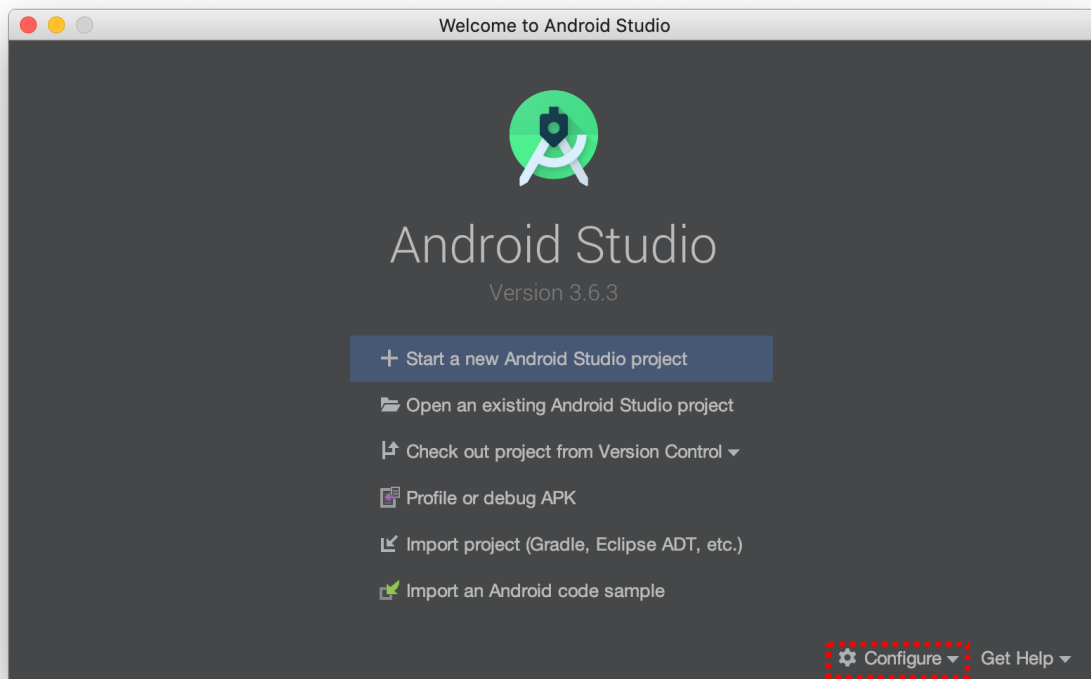
George Mason University
SAGE Research Lab

I. Environment Setup

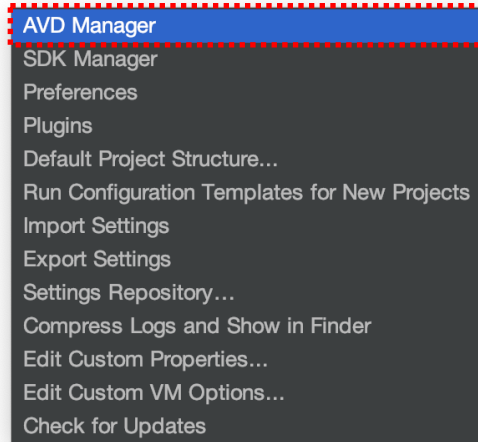
This section describes how to set up your machine for collecting videos and traces. To run the Android apps and record actions, you will need to install and set up a particular instance of an Android emulator using Android studio. Please follow the following steps to set up the emulator:

A. Emulator Setup

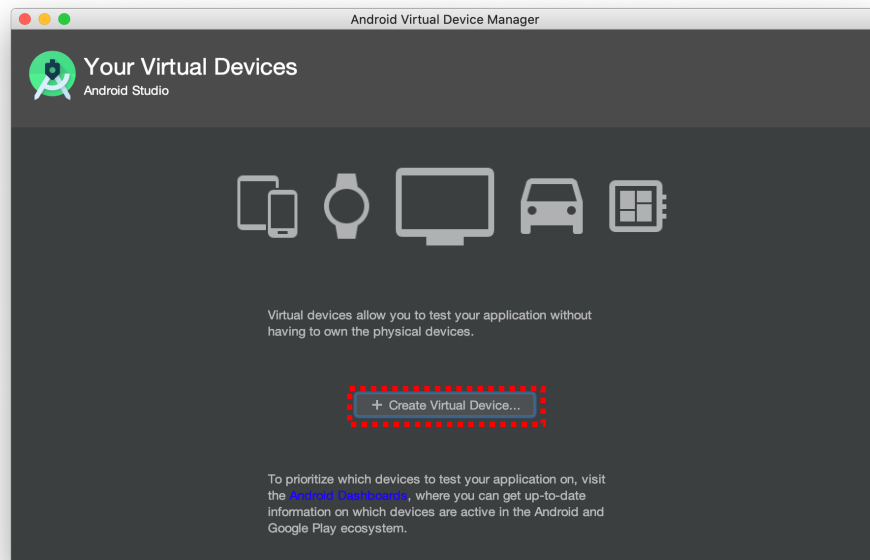
- 1) Download the Android Studio installer for your operating system (Windows/Mac) by visiting the following URL (if you do not already have it installed):
 - a. <https://developer.android.com/studio>
- 2) Launch the installer and follow the on-screen instructions to install Android studio on your machine. You can use the default installation settings. Agree to install the HAXM installer (this may involve granting security permissions on macOS).
- 3) After the software is installed, you need to instantiate a new emulator instance that conforms to the study guidelines. To do this, click on the configure button in the bottom right hand side of Android Studio's initial screen.



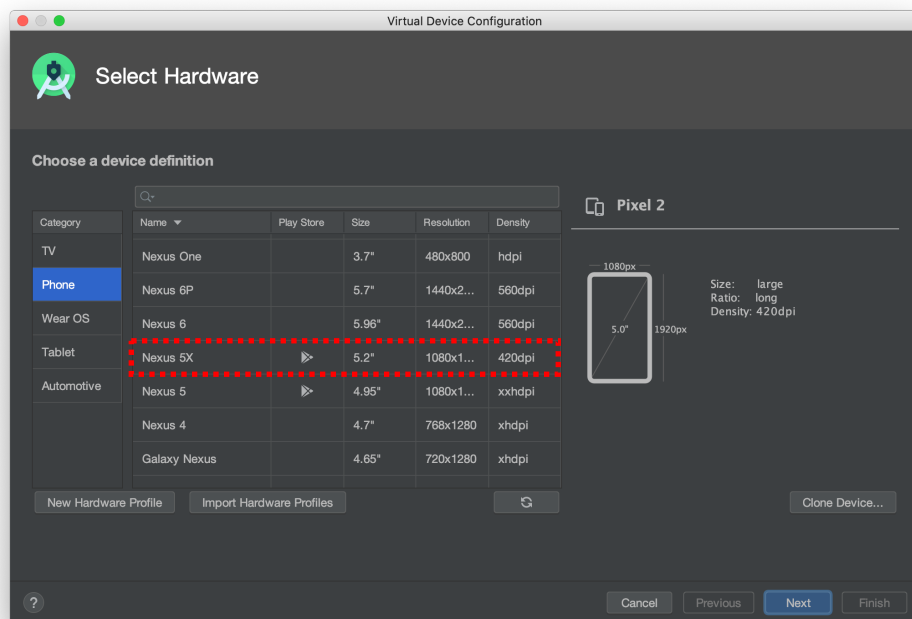
- 4) Next, select the AVD manager option from the dropdown list that appears:



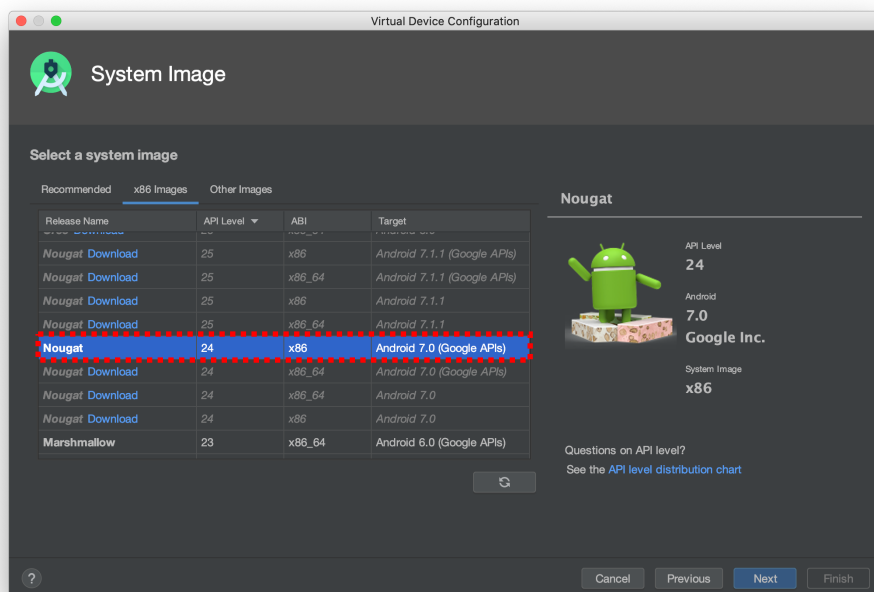
- 5) Next you need to properly configure the emulator for the parameters of the study. To do this, first click on the “create virtual device” option in the middle of the AVD manager window. If there is an existing default virtual device, please delete it and configure your device as shown in these instructions.



- 6) Next, you will need to select the proper device configuration. For this study, you will be using a simulated Nexus 5X device running Android 7.0. Therefore, from the hardware configuration screen you will need choose the Nexus 5X option from the list, as illustrated below:

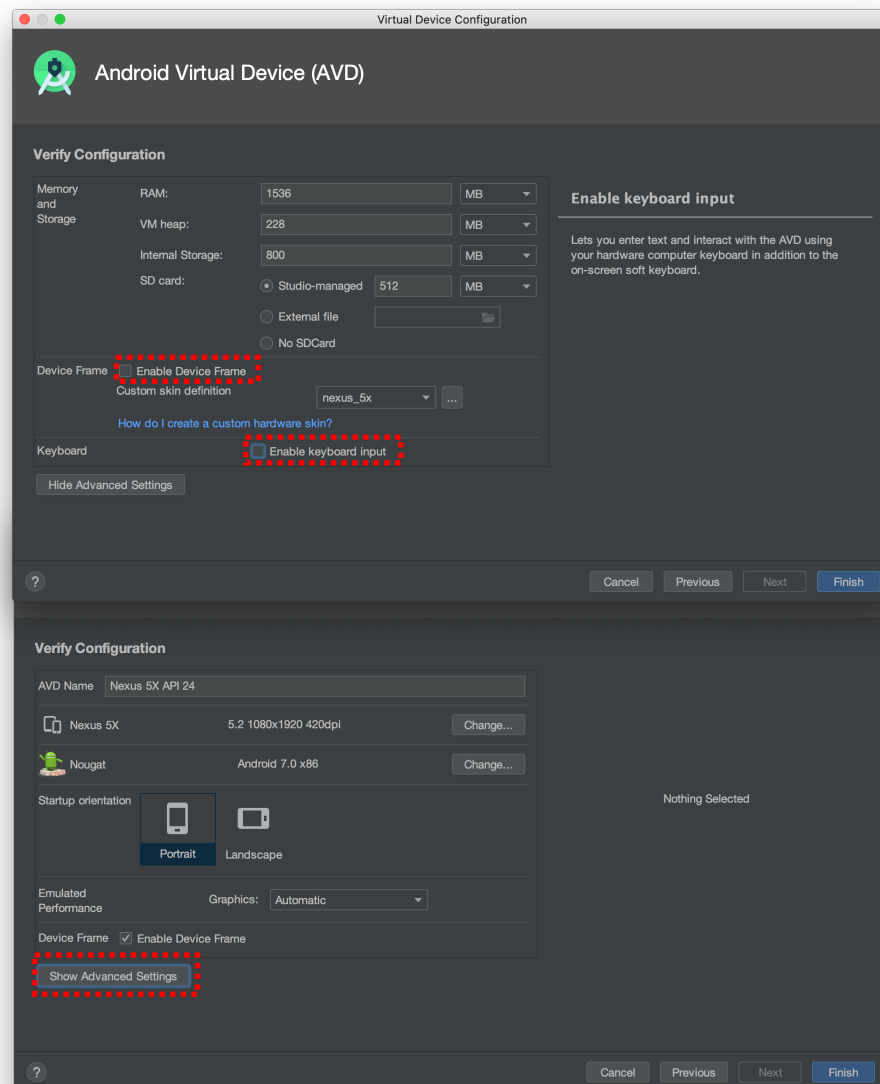


- 7) After you have selected the Nexus 5X configuration and moved to the next screen you will need to select proper Android version for the device. On the "System Image" configuration page, you will first need to select the "x86 Images" tab, and then scroll down until you see the "Android 7.0 (Google APIs)" option under the "Target" heading. Select this option. Note that this may require

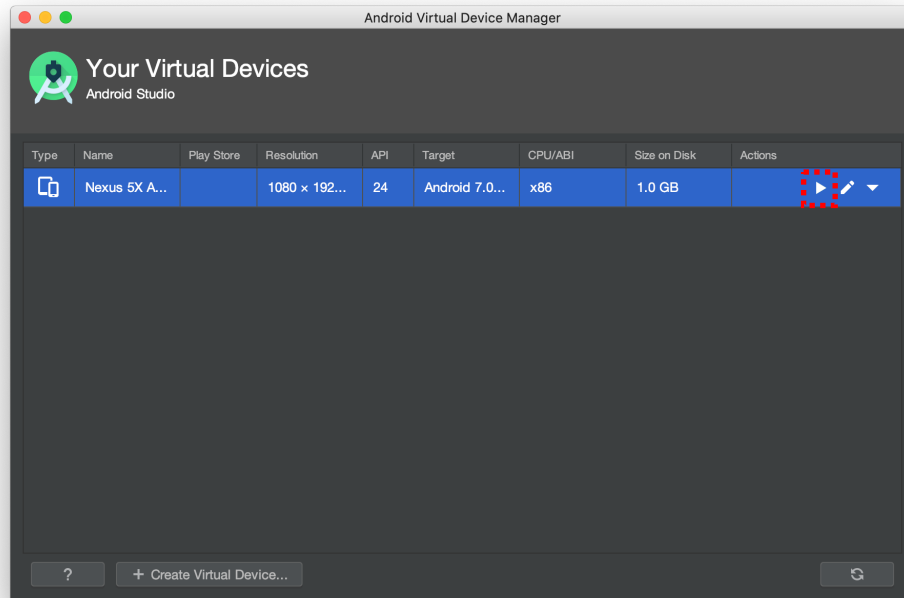


you to download the image using the “Download” button. If this is the case, follow the onscreen instructions to download the image.

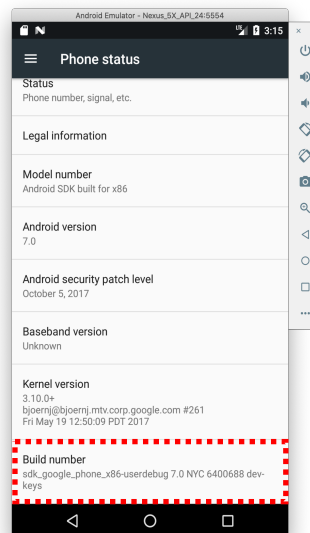
- 8) After selecting the hardware and software configuration for your virtual device, you will need to then configure the device properties before it can be used. To do this, on the device configuration page, you should first **disable** the device frame, and then click on the advanced settings option at the bottom of the screen.
- 9) At the bottom of the “Advanced Options” screen, you will also need to **disable** the “Enable keyboard input” option. This will only allow for input through the device virtual keyboard, which is required for this study. You can also configure other options such as the number of cores and default amount of RAM, according to the specs of your host machine. We recommend you leave them as default for optimal performance however.



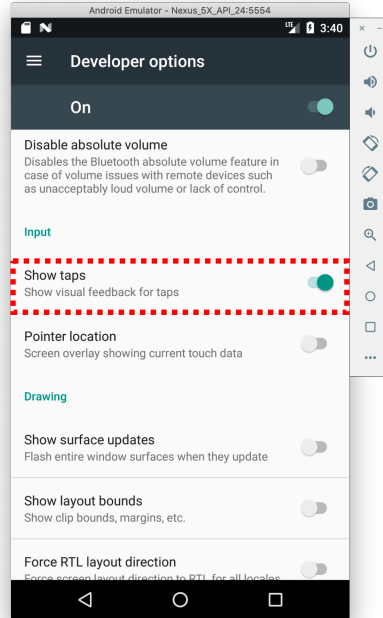
- 10) Finally, you can click the finish button and then launch the emulator by clicking on the green arrow next to the device that you created.



- 11) Next, you will need to launch the emulator and enable the “Show Touches” setting from the Developer options menu. To do this, open the “Settings” app and then tap on the “About emulated device” menu option. Then tap on the “Build Number” menu item (as highlighted in red below) 8 times in order to enable developer options.



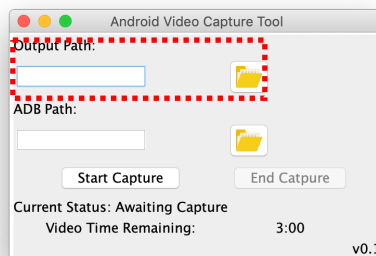
- 12) Next, go back to the main “Settings” menu, tap on the newly added “Developer Options” menu item. Then, scroll down to the “Show Taps” menu option and enable it, as illustrated below. This will place a visible touch indicator on the smartphone screen whenever you touch it.



13) This completes the emulator setup.

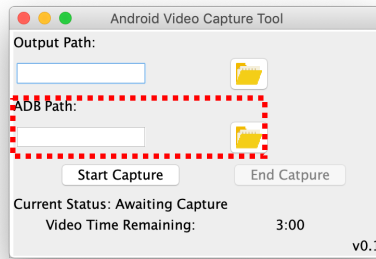
B. Device Capture Tool Setup

- 1) Download the Android Capture tool executable from one of the links below:
 - a. Link for Mac/Linux: <https://www.dropbox.com/s/lkw3ikt96xhhrey/ACT-Mac-App.zip?dl=0>
 - b. Link for Windows: <https://www.dropbox.com/s/8t2m4bdaq39bwy9/ACT-Windows-App.zip?dl=0>
- 2) Open the Android Capture Tool (You may have to grant security access on macOS). In the first text field (illustrated below), enter or select the path on your machine where you would like your recorded videos and traces to be saved.

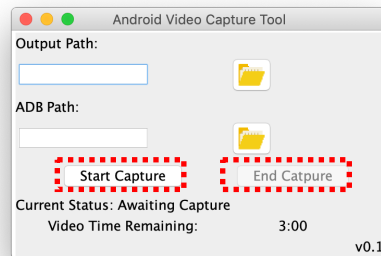


- 3) Next you will need to supply the Android Capture Tool with a path to the “Android Debug Bridge” (adb) Tool that the host machine uses to connect to a running emulator instance. The locations for this executable on Mac and Windows are given below:
 - a. Typical Mac Location: `/Users/$USER/Library/Android/sdk/platform-tools/adb`

b. Windows: `C:\Users\[user]\AppData\Local\Android\sdk\platform-tools\adb.exe`



- 4) After supplying the adb path, you should now be ready to use the Android Device Capture Tool. Simply launch the emulator that you configured previously, and then click the “Start Capture” button. **Note that during the study, you should only click the start capture button when at the initial screen of one of your apps** (See next section). You will then have a 3 minute window to perform a test recording. When you are finished with the recording, simply click the “End Capture” button to end the recording. After clicking this button the tool will perform some cleanup and should save a video file and log file to the output location you specified. You will use this same procedure during the study.

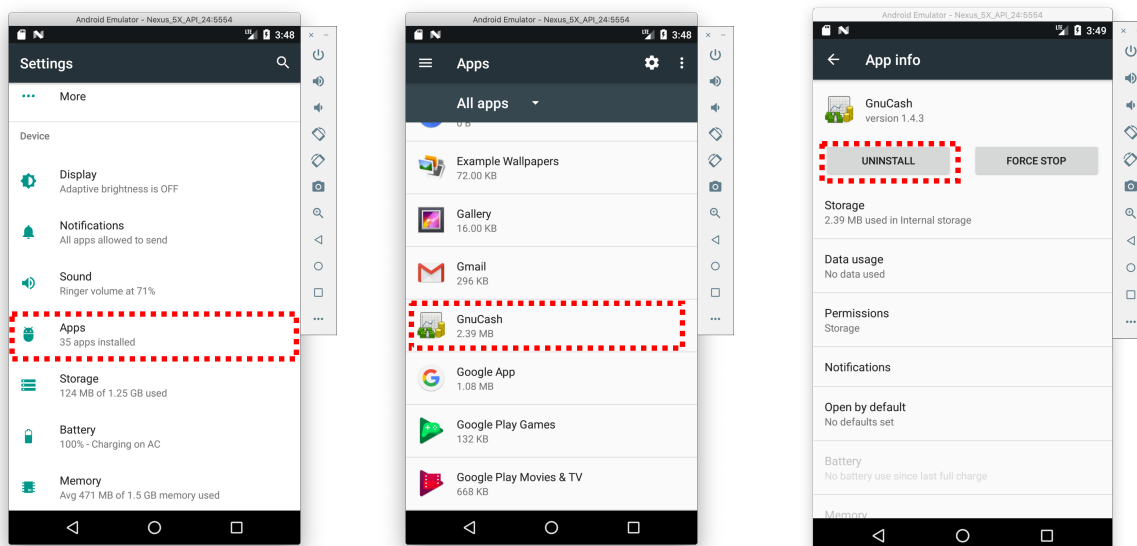


II. Usage Trace Collection

This section describes the steps of collecting a trace of an app.

- 1) First, if you have previously installed the app, you must uninstall and reinstall the application. To do this, navigate to the settings menu on the emulator, and select the “Apps” menu item as highlighted below.
- 2) Next, tap on the menu item for the app that you wish to uninstall, in the example below we will be uninstalling the GnuCash application.

3) Then tap on the uninstall button, as illustrated below.



4) After you have uninstalled the application, you can then drag it back into the emulator to install it again. **You must uninstall and re-install the application before each trace that you record for the study.**

5) Next, make sure that you have launched the Android Device capture tool and filled in the relevant “Output” and “ADB” path information as described in the environment setup instructions. Once you do this are ready to record a trace. **Each trace you record must conform to the following constraints:**

- a. **Each trace should begin on the initial screen of the application after it has been re-installed and launched.**
- b. Please wait 2-4 seconds from the time you click the “Start Capture” button to when you start to perform actions on the app.
- c. Each trace must exercise one **realistic** usage for the app.
- d. Each trace must be **no longer** than three minutes.
- e. When recording each trace, be sure to wait at least one second in between each action to ensure that each action is recorded properly.
- f. When recording each trace, be sure to tap/click as close to the center of each GUI-component as possible, to ensure that the trace is recorded properly.
- g. Do not use the scroll wheel on your mouse to scroll through lists or screens of an application. Instead always drag the mouse cursor on the emulator to scroll.
- h. Do not use your laptop/computer keyboard to type text into an application during recording. Always use the on-screen Android virtual keyboard.
- i. If for some reason during your exploration you leave the app, (e.g. you are transferred to another app) please press the back button at the bottom of the screen to return to the app you are testing.

6) Now that you have carefully read the trace collection constraints listed above, you can begin the trace collection by clicking on the “Start Capture” button of the Android Device Capture tool. **Remember to start recording at the initial screen of the app after you launch it.** You can then perform your actions according to the constraints listed above and click the “End Capture” button when you are finished. This will generate two automatically named files in the format:

- a. <timestamp>getevent.log and <timestamp>video.mp4
- 7) After each trace is collected, you should first check to make sure that the recorded video accurately captured your actions **and** that the log file is not empty. If either the video or log file is incorrect, please re-record the trace. Once you have confirmed the trace was recorded properly, put the files in a folder named after the apk name and rename the trace files as indicated below. Additionally, you should add a text file for each trace recorded that briefly describes the functionality the trace executes. In each example the number in <> should be incremented by one for each trace recorded for a given app.
 - a. Example Video File naming: etsy/video-<usage-name>-<usage-#>.mp4
 - b. Example Getevent File naming: etsy/getevent-<usage-name>-<usage-#>.log
 - c. e.g. Example trace names might be “etsy/video-signup-1.mp4” and “etsy/getevent-signup-1.log”
- 8) Repeat this process for each app, uninstalling and re-installing the app before collecting each trace so that the trace begins on the initial screen of the app.