

Augmented Education Mobile Code

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Chapter 1

Namespace Index

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Class Index

3.1 Class List

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Chapter 4

Namespace Documentation

4.1 Package `com.augmentededucation.ar.augmentededucationar.arcore.rendering`

Classes

- class [BackgroundRenderer](#)
- class [ObjectRenderer](#)
- class [PlaneRenderer](#)
- class [PointCloudRenderer](#)
- class [ShaderUtil](#)
- class [TGARenderer](#)

4.1.1 Detailed Description

This package contains classes that do the rendering for this example.

`TGARenderer.java`

Copyright (c) 2014 Kenji Sasaki Released under the MIT license. <https://github.com/npedotnet/TGARenderer/blob/master/LICENSE>

English document <https://github.com/npedotnet/TGARenderer/blob/master/README.md>

Japanese document <http://3dtech.jp/wiki/index.php?TGARenderer>

4.2 Package `com.augmentededucation.augmentededucationar`

4.2.1 Detailed Description

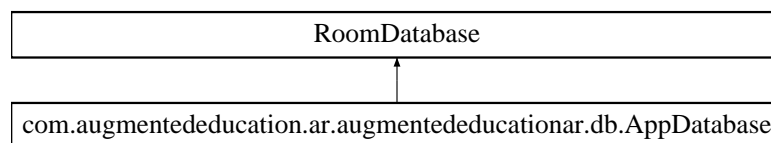
A sample showing how to build an Augmented Reality app using ARCore.

Chapter 5

Class Documentation

5.1 `com.augmentededucation.ar.augmentededucationar.db.AppDatabase` Class Reference

Inheritance diagram for `com.augmentededucation.ar.augmentededucationar.db.AppDatabase`:



Public Member Functions

- abstract `ModelDao modelDao ()`

Static Public Member Functions

- static `AppDatabase getInstance (Context context, String dbName)`
- static void `destroyInstance ()`

5.1.1 Detailed Description

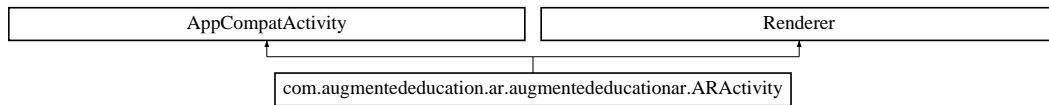
Creates a database holder called `AppDatabase` that extends `RoomDatabase`. Contains methods to create and return an instance of the database, and destroy the instance. Entities such as `Model` are stored in the `AppDatabase` object.

The documentation for this class was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/db/AppDatabase.java`

5.2 com.augmentededucation.ar.augmentededucationar.ARActivity Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.ARActivity:



Public Member Functions

- void [onSurfaceCreated](#) (GL10 gl, EGLConfig config)
- void [onSurfaceChanged](#) (GL10 gl, int width, int height)
- void [onDrawFrame](#) (GL10 gl)
- void **onBig** (View v)
- void **onLittle** (View v)

Static Public Attributes

- static final String [FILENAME_TAG](#) = "filename_tag"

Protected Member Functions

- void [onCreate](#) (Bundle savedInstanceState)
- void [onResume](#) ()
- void **onPause** ()

5.2.1 Detailed Description

The activity to host the ObjectRenderer to display a selected model. The user should have entered this activity through the [HomeActivity](#) where they choose a model they would like to view.

A large portion of this code was based on the sample provided by Google to learn ARCore.

5.2.2 Member Function Documentation

5.2.2.1 onCreate()

```
void com.augmentededucation.ar.augmentededucationar.ARActivity.onCreate (
    Bundle savedInstanceState ) [protected]
```

Creates the activity by setting up the member variables and registering event handlers.

Parameters

<i>savedInstanceState</i>	Bundle to hold saved data
---------------------------	---------------------------

5.2.2.2 onDrawFrame()

```
void com.augmentededucation.ar.augmentededucationar.ARActivity.onDrawFrame (
    GL10 gl )
```

Draws the screen

Parameters

<i>gl</i>	The gl object used to draw
-----------	----------------------------

5.2.2.3 onResume()

```
void com.augmentededucation.ar.augmentededucationar.ARActivity.onResume ( ) [protected]
```

When the activity resumes after calling onPause() Resumes the session and viewers.

5.2.2.4 onSurfaceChanged()

```
void com.augmentededucation.ar.augmentededucationar.ARActivity.onSurfaceChanged (
    GL10 gl,
    int width,
    int height )
```

When the surface is changed

Parameters

<i>gl</i>	GL object
<i>width</i>	The Width
<i>height</i>	The Height

5.2.2.5 onSurfaceCreated()

```
void com.augmentededucation.ar.augmentededucationar.ARActivity.onSurfaceCreated (
    GL10 gl,
    EGLConfig config )
```

Loads in the model nd sets up the surface view for Open GL.

Parameters

<i>gl</i>	GL object
<i>config</i>	Configuration

5.2.3 Member Data Documentation

5.2.3.1 FILENAME_TAG

```
final String com.augmentededucation.ar.augmentededucationar.ARActivity.FILENAME_TAG = "filename↵_tag" [static]
```

The tag used to store the model name to render in the bundle.

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/ARActivity.java

5.3 com.augmentededucation.ar.augmentededucationar.camera.CameraSource.AutoFocusCallback Interface Reference

Public Member Functions

- void [onAutoFocus](#) (boolean success)

5.3.1 Detailed Description

Callback interface used to notify on completion of camera auto focus.

5.3.2 Member Function Documentation

5.3.2.1 onAutoFocus()

```
void com.augmentededucation.ar.augmentededucationar.camera.CameraSource.AutoFocusCallback.on↵AutoFocus (
    boolean success )
```

Called when the camera auto focus completes. If the camera does not support auto-focus and `onAutoFocus` is called, `onAutoFocus` will be called immediately with a fake value of `success` set to `true`.

The auto-focus routine does not lock auto-exposure and auto-white balance after it completes.

Parameters

<i>success</i>	true if focus was successful, false if otherwise
----------------	--

The documentation for this interface was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/camera/CameraSource.java`

5.4 `com.augmentededucation.ar.augmentededucationar.arcore.rendering.BackgroundRenderer` [↔](#) **Renderer Class Reference**

Public Member Functions

- `int getTextureId ()`
- `void createOnGltThread (Context context)`
- `void draw (Frame frame)`

5.4.1 Detailed Description

This class renders the AR background from camera feed. It creates and hosts the texture given to ARCore to be filled with the camera image.

5.4.2 Member Function Documentation**5.4.2.1 `createOnGltThread()`**

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.BackgroundRenderer.↔
createOnGltThread (
    Context context )
```

Allocates and initializes OpenGL resources needed by the background renderer. Must be called on the OpenGL thread, typically in `GLSurfaceView.Renderer#onSurfaceCreated(GL10, EGLConfig)`.

Parameters

<i>context</i>	Needed to access shader source.
----------------	---------------------------------

5.4.2.2 `draw()`

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.BackgroundRenderer.draw (
    Frame frame )
```


5.5 com.augmentededucation.ar.augmentededucationar.barcode.BarcodeTracker.BarcodeGraphicTrackerCallback Interface

Reference 15

Draws the AR background image. The image will be drawn such that virtual content rendered with the matrices provided by com.google.ar.core.Camera#getViewMatrix(float[], int) and com.google.ar.core.Camera#getProjectionMatrix(float[], int, float) will accurately follow static physical objects. This must be called **before** drawing virtual content.

Parameters

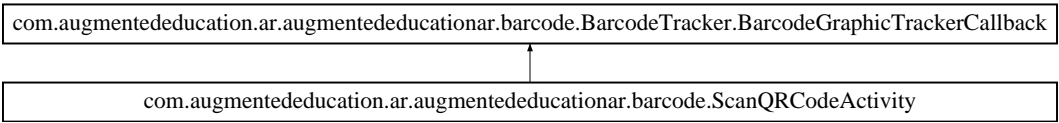
frame	The last Frame returned by Session#update().
-------	--

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/rendering/BackgroundRenderer.java

5.5 com.augmentededucation.ar.augmentededucationar.barcode.BarcodeTracker.BarcodeGraphicTrackerCallback Interface Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.barcode.BarcodeTracker.BarcodeGraphicTrackerCallback:



Public Member Functions

- void onDetectedQRCode (Barcode barcode)

5.5.1 Detailed Description

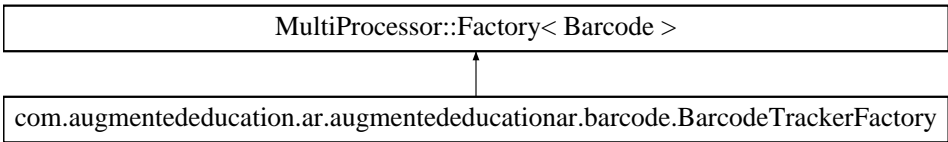
An interface where the function onDetectedQRCode will be called after attempting to find a barcode at the Activity level.

The documentation for this interface was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/barcode/BarcodeTracker.java

5.6 com.augmentededucation.ar.augmentededucationar.barcode.BarcodeTrackerFactory Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.barcode.BarcodeTrackerFactory:



Public Member Functions

- `Tracker< Barcode > create (Barcode barcode)`

5.6.1 Detailed Description

Factory for creating a tracker to be associated with a new barcode. The multi-processor uses this factory to create barcode trackers as needed - one for each barcode.

The documentation for this class was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/barcode/BarcodeTrackerFactory.java`

5.7 `com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer`. BlendMode Enum Reference

Public Attributes

- [Shadow](#)
- [Grid](#)

5.7.1 Detailed Description

Blend mode.

See also

[setBlendMode\(BlendMode\)](#)

5.7.2 Member Data Documentation

5.7.2.1 Grid

`com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.BlendMode.Grid`

Normal alpha blending.

5.7.2.2 Shadow

`com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.BlendMode.Shadow`

Multiplies the destination color by the source alpha.

The documentation for this enum was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/rendering/ObjectRenderer.java`

5.8 com.augmentededucation.ar.augmentededucationar.arccore.CameraPermissionHelper Class Reference ↔

Static Public Member Functions

- static boolean [hasCameraPermission](#) (Activity activity)
- static void [requestCameraPermission](#) (Activity activity)
- static boolean [shouldShowRequestPermissionRationale](#) (Activity activity)
- static void [launchPermissionSettings](#) (Activity activity)

5.8.1 Detailed Description

Helper to ask camera permission.

5.8.2 Member Function Documentation

5.8.2.1 hasCameraPermission()

```
static boolean com.augmentededucation.ar.augmentededucationar.arccore.CameraPermissionHelper.↔  
hasCameraPermission (   
    Activity activity ) [static]
```

Check to see we have the necessary permissions for this app.

5.8.2.2 launchPermissionSettings()

```
static void com.augmentededucation.ar.augmentededucationar.arccore.CameraPermissionHelper.↔  
launchPermissionSettings (   
    Activity activity ) [static]
```

Launch Application Setting to grant permission.

5.8.2.3 requestCameraPermission()

```
static void com.augmentededucation.ar.augmentededucationar.arccore.CameraPermissionHelper.↔  
requestCameraPermission (   
    Activity activity ) [static]
```

Check to see we have the necessary permissions for this app, and ask for them if we don't.

5.8.2.4 shouldShowRequestPermissionRationale()

```
static boolean com.augmentededucation.ar.augmentededucationar.arcore.CameraPermissionHelper.↵
shouldShowRequestPermissionRationale (
    Activity activity ) [static]
```

Check to see if we need to show the rationale for this permission.

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/CameraPermissionHelper.↵
java

5.9 com.augmentededucation.ar.augmentededucationar.camera.CameraSource Class Reference

Classes

- interface [AutoFocusCallback](#)
- class **Builder**
- interface [FlashMode](#)
- interface [FocusMode](#)

Public Member Functions

- void [release](#) ()
- [CameraSource start](#) () throws IOException
- [CameraSource start](#) (SurfaceHolder surfaceHolder) throws IOException
- void [stop](#) ()
- Size [getPreviewSize](#) ()
- String [getFocusMode](#) ()
- boolean [setFocusMode](#) (@FocusMode String mode)
- void [autoFocus](#) (@Nullable [AutoFocusCallback](#) cb)
- void [cancelAutoFocus](#) ()

Static Public Attributes

- static final int **CAMERA_FACING_BACK** = Camera.CameraInfo.CAMERA_FACING_BACK
- static final int **CAMERA_FACING_FRONT** = Camera.CameraInfo.CAMERA_FACING_FRONT

5.9.1 Detailed Description

Manages the camera in conjunction with an underlying com.google.android.gms.vision.Detector. This receives preview frames from the camera at a specified rate, sending those frames to the detector as fast as it is able to process those frames.

This camera source makes a best effort to manage processing on preview frames as fast as possible, while at the same time minimizing lag. As such, frames may be dropped if the detector is unable to keep up with the rate of frames generated by the camera. `CameraSource.Builder#setRequestedFps(float)` specifies a frame rate that works well with the capabilities of the camera hardware and the detector options that selected. If CPU utilization is higher than preferred, FPS can be reduced. If the camera preview or detector results are too "jerky", increase FPS.

The following Android permission is required to use the camera:

- android.permissions.CAMERA

5.9.2 Member Function Documentation

5.9.2.1 autoFocus()

```
void com.augmentededucation.ar.augmentededucationar.camera.CameraSource.autoFocus (
    @Nullable AutoFocusCallback cb )
```

Starts camera auto-focus and registers a callback function to run when the camera is focused. This method is only valid when preview is active (between [start\(\)](#) or [start\(SurfaceHolder\)](#) and before [stop\(\)](#) or [release\(\)](#)).

Callers should check [getFocusMode\(\)](#) to determine if this method should be called. If the camera does not support auto-focus, it is a no-op and [AutoFocusCallback#onAutoFocus\(boolean\)](#) callback will be called immediately.

If the current flash mode is not `Camera.Parameters#FLASH_MODE_OFF`, flash may be fired during auto-focus, depending on the driver and camera hardware.

Parameters

<i>cb</i>	the callback to run
-----------	---------------------

See also

[cancelAutoFocus\(\)](#)

5.9.2.2 cancelAutoFocus()

```
void com.augmentededucation.ar.augmentededucationar.camera.CameraSource.cancelAutoFocus ( )
```

Cancels any auto-focus function in progress. Whether or not auto-focus is currently in progress, this function will return the focus position to the default. If the camera does not support auto-focus, this is a no-op.

See also

[#autoFocus\(AutoFocusCallback\)](#)

5.9.2.3 getFocusMode()

```
String com.augmentededucation.ar.augmentededucationar.camera.CameraSource.getFocusMode ( )
```

Gets the current focus mode setting.

Returns

current focus mode. This value is null if the camera is not yet created. Applications should call `autoFocus(AutoFocusCallback)` to start the focus if focus mode is `FOCUS_MODE_AUTO` or `FOCUS_↵
MODE_MACRO`.

See also

Camera.Parameters::FOCUS_MODE_AUTO
 Camera.Parameters::FOCUS_MODE_INFINITY
 Camera.Parameters::FOCUS_MODE_MACRO
 Camera.Parameters::FOCUS_MODE_FIXED
 Camera.Parameters::FOCUS_MODE_EDOF
 Camera.Parameters::FOCUS_MODE_CONTINUOUS_VIDEO
 Camera.Parameters::FOCUS_MODE_CONTINUOUS_PICTURE

5.9.2.4 getPreviewSize()

```
Size com.augmentededucation.ar.augmentededucationar.camera.CameraSource.getPreviewSize ( )
```

Returns the preview size that is currently in use by the underlying camera.

5.9.2.5 release()

```
void com.augmentededucation.ar.augmentededucationar.camera.CameraSource.release ( )
```

Stops the camera and releases the resources of the camera and underlying detector.

5.9.2.6 setFocusMode()

```
boolean com.augmentededucation.ar.augmentededucationar.camera.CameraSource.setFocusMode (
    @FocusMode String mode )
```

Sets the focus mode.

Parameters

<i>mode</i>	the focus mode
-------------	----------------

Returns

`true`
 if the focus mode is set,

`false`

 otherwise

See also

[getFocusMode\(\)](#)

5.9.2.7 start() [1/2]

`CameraSource com.augmentededucation.ar.augmentededucationar.camera.CameraSource.start ()`
throws `IOException`

Opens the camera and starts sending preview frames to the underlying detector. The preview frames are not displayed.

Exceptions

<code>IOException</code>	if the camera's preview texture or display could not be initialized
--------------------------	---

5.9.2.8 start() [2/2]

`CameraSource com.augmentededucation.ar.augmentededucationar.camera.CameraSource.start (`
`SurfaceHolder surfaceHolder) throws IOException`

Opens the camera and starts sending preview frames to the underlying detector. The supplied surface holder is used for the preview so frames can be displayed to the user.

Parameters

<code>surfaceHolder</code>	the surface holder to use for the preview frames
----------------------------	--

Exceptions

<code>IOException</code>	if the supplied surface holder could not be used as the preview display
--------------------------	---

5.9.2.9 stop()

`void com.augmentededucation.ar.augmentededucationar.camera.CameraSource.stop ()`

Closes the camera and stops sending frames to the underlying frame detector.

This camera source may be restarted again by calling [start\(\)](#) or [start\(SurfaceHolder\)](#).

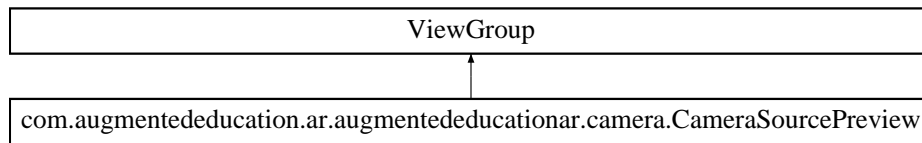
Call [release\(\)](#) instead to completely shut down this camera source and release the resources of the underlying detector.

The documentation for this class was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/camera/CameraSource.java`

5.10 com.augmentededucation.ar.augmentededucationar.camera.CameraSourcePreview Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.camera.CameraSourcePreview:



Public Member Functions

- **CameraSourcePreview** (Context context, AttributeSet attrs)
- void **start** (CameraSource cameraSource) throws IOException, SecurityException
- void **stop** ()
- void **release** ()

Protected Member Functions

- void **onLayout** (boolean changed, int left, int top, int right, int bottom)

5.10.1 Detailed Description

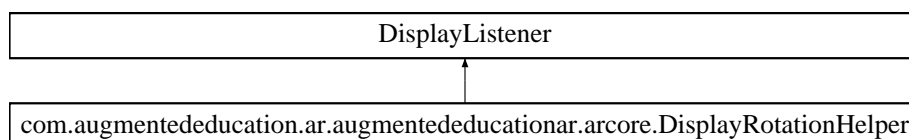
Google library to handle the camera source. Includes methods to start/stop and manage the layout of the camera stream.

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/camera/CameraSourcePreview.java

5.11 com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper:



Public Member Functions

- [DisplayRotationHelper](#) (Context context)
- void [onResume](#) ()
- void [onPause](#) ()
- void [onSurfaceChanged](#) (int width, int height)
- void [updateSessionIfNeeded](#) (Session session)
- int [getRotation](#) ()
- void **onDisplayAdded** (int displayId)
- void **onDisplayRemoved** (int displayId)
- void **onDisplayChanged** (int displayId)

5.11.1 Detailed Description

Helper to track the display rotations. In particular, the 180 degree rotations are not notified by the [onSurfaceChanged\(\)](#) callback, and thus they require listening to the android display events.

5.11.2 Constructor & Destructor Documentation

5.11.2.1 DisplayRotationHelper()

```
com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper.DisplayRotationHelper (
    Context context )
```

Constructs the [DisplayRotationHelper](#) but does not register the listener yet.

Parameters

<i>context</i>	the Android Context.
----------------	----------------------

5.11.3 Member Function Documentation

5.11.3.1 getRotation()

```
int com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper.getRotation (
)
```

Returns the current rotation state of android display. Same as Display#getRotation().

5.11.3.2 onPause()

```
void com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper.onPause ( )
```

Unregisters the display listener. Should be called from Activity#onPause().

5.11.3.3 onResume()

```
void com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper.onResume ( )
```

Registers the display listener. Should be called from Activity#onResume().

5.11.3.4 onSurfaceChanged()

```
void com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper.onSurface↵
Changed (
    int width,
    int height )
```

Records a change in surface dimensions. This will be later used by [updateSessionIfNeeded\(Session\)](#). Should be called from #onSurfaceChanged(javax.microedition.khronos.opengles.GL10, int, int).

Parameters

<i>width</i>	the updated width of the surface.
<i>height</i>	the updated height of the surface.

5.11.3.5 updateSessionIfNeeded()

```
void com.augmentededucation.ar.augmentededucationar.arcore.DisplayRotationHelper.update↵
SessionIfNeeded (
    Session session )
```

Updates the session display geometry if a change was posted either by [onSurfaceChanged\(int, int\)](#) call or by onDisplayChanged(int) system callback. This function should be called explicitly before each call to Session#update(). This function will also clear the 'pending update' (viewportChanged) flag.

Parameters

<i>session</i>	the Session object to update if display geometry changed.
----------------	---

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/DisplayRotationHelper.java

5.12 com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor.[↔](#) DownloadQueued Interface Reference

Public Member Functions

- void **downloadQueued** (long downloadId)

5.12.1 Detailed Description

An interface defined to call when a file download has been queued

The documentation for this interface was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/WebAccess/WebAccessor.java

5.13 com.augmentededucation.ar.augmentededucationar.ExampleInstrumentedTest Class Reference

Public Member Functions

- void **useAppContext** () throws Exception

5.13.1 Detailed Description

Instrumented test, which will execute on an Android device.

See also

[Testing documentation](#)

The documentation for this class was generated from the following file:

- app/src/androidTest/java/com/augmentededucation/ar/augmentededucationar/ExampleInstrumentedTest.[↔](#)
java

5.14 com.augmentededucation.ar.augmentededucationar.ExampleUnitTest Class Refer- ence

Public Member Functions

- void **addition_isCorrect** () throws Exception
-

5.14.1 Detailed Description

Example local unit test, which will execute on the development machine (host).

See also

[Testing documentation](#)

The documentation for this class was generated from the following file:

- `app/src/test/java/com/augmentededucation/ar/augmentededucationar/ExampleUnitTest.java`

5.15 `com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor`.↵ FileDescriptor Enum Reference

Public Attributes

- `ALL`
- `OWNED_ALL`
- `OWNED_PRIVATE`
- `OWNED_PUBLIC`
- `NOT_OWNED_PUBLIC`

5.15.1 Detailed Description

An enum to define the levels of access to retrieve a file with. This should be the same as the website for consistency.

The documentation for this enum was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/WebAccess/WebAccessor.java`

5.16 `com.augmentededucation.ar.augmentededucationar.FileManager` Class Reference

Public Member Functions

- `FileManager` (Context context)
- void `downloadModel` (final `Model` model, String authToken, final BroadcastReceiver receiver, WebAccessor.↵ onDownloadError downloadError)
- void `addModelToDatabase` (`Model` model)
- void `setModelDB` (`Model` model)
- `Model` `getUpdatedModel` (`Model` model)
- ArrayList< `Model` > `getListOfModels` ()
- ArrayList< `Model` > `getLocalModels` ()

Static Public Attributes

- static final String `assetsFileNameSubstring` = "file:///android_asset/"
-

5.16.1 Detailed Description

A class for file management. It keeps track of models downloaded from the website through a room database.

TODO: scan models folder for existing models

5.16.2 Constructor & Destructor Documentation

5.16.2.1 FileManager()

```
com.augmentededucation.ar.augmentededucationar.FileManager.FileManager (
    Context context )
```

The constructor to initialize the private variables

TODO: Scan the models directory and check if any files were added/deleted and update the database accordingly

Parameters

<i>context</i>	The app context needed by various methods
----------------	---

5.16.3 Member Function Documentation

5.16.3.1 addModelToDatabase()

```
void com.augmentededucation.ar.augmentededucationar.FileManager.addModelToDatabase (
    Model model )
```

Add a model to the database. If the model currently exists in the database, it will do nothing.

Parameters

<i>model</i>	The model to add
--------------	------------------

5.16.3.2 downloadModel()

```
void com.augmentededucation.ar.augmentededucationar.FileManager.downloadModel (
    final Model model,
    String authToken,
```

```
final BroadcastReceiver receiver,
WebAccessor.onDownloadError downloadError )
```

Download a model. The function will do nothing if a model is currently downloading. The provided broadcast receiver will be executed when a successful download is completed. If an error occurs, the onDownloadError object provided will be executed.

TODO: Remove a failed download from the downloads folder, as successive downloads will create misnamed archives and never succeed

Parameters

<i>model</i>	The model to download
<i>authToken</i>	The authorization token to communicate with the website
<i>receiver</i>	The receiver to handle a download
<i>downloadError</i>	An error receiver that will be called if an error occurs

5.16.3.3 getListOfModels()

```
ArrayList<Model> com.augmentededucation.ar.augmentededucationar.FileManager.getListOfModels (
)
```

Get a list of models tracked in the database

Returns

A list of models from the database

5.16.3.4 getLocalModels()

```
ArrayList<Model> com.augmentededucation.ar.augmentededucationar.FileManager.getLocalModels ( )
```

A subset of getListOfModels where only the models where location is not empty will be returned

Returns

A list of models where the location is not empty (the model is on the phone)

5.16.3.5 getUpdatedModel()

```
Model com.augmentededucation.ar.augmentededucationar.FileManager.getUpdatedModel (
    Model model )
```

Get an updated model. Given a model, get whats in the database, even if the non-primary key fields are different.

Parameters

<i>model</i>	The model to get
--------------	------------------

Returns

The model as stored in the database

5.16.3.6 setModelDB()

```
void com.augmentededucation.ar.augmentededucationar.FileManager.setModelDB (
    Model model )
```

Sets a model in the database. It has the same functionality as the addModelToDatabase function, but will overwrite a model if it exists.

Parameters

<i>model</i>	The model to set
--------------	------------------

5.16.4 Member Data Documentation

5.16.4.1 assetsFileNameSubstring

```
final String com.augmentededucation.ar.augmentededucationar.FileManager.assetsFileNameSubstring
= "file:///android_asset/" [static]
```

String prepended to model's that are located in the assets folder

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/FileManager.java

5.17 com.augmentededucation.ar.augmentededucationar.camera.CameraSource.Flash↩ Mode Interface Reference

The documentation for this interface was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/camera/CameraSource.java

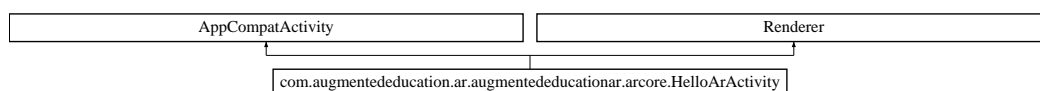
5.18 `com.augmentededucation.ar.augmentededucationar.camera.CameraSource`.[↔](#) FocusMode Interface Reference

The documentation for this interface was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/camera/CameraSource.java`

5.19 `com.augmentededucation.ar.augmentededucationar.arcore.HelloArActivity` Class Reference

Inheritance diagram for `com.augmentededucation.ar.augmentededucationar.arcore.HelloArActivity`:



Public Member Functions

- void **onLittle** (View v)
- void **onBig** (View v)
- void **onPause** ()
- void **onRequestPermissionsResult** (int requestCode, String[] permissions, int[] results)
- void **onWindowFocusChanged** (boolean hasFocus)
- void **onSurfaceCreated** (GL10 gl, EGLConfig config)
- void **onSurfaceChanged** (GL10 gl, int width, int height)
- void **onDrawFrame** (GL10 gl)

Protected Member Functions

- void **onCreate** (Bundle savedInstanceState)
- void **onResume** ()

5.19.1 Detailed Description

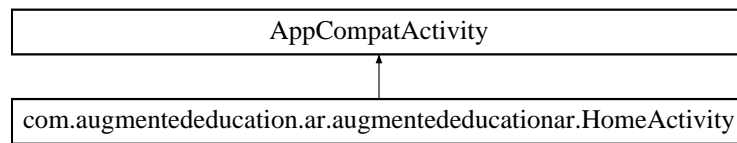
This is a simple example that shows how to create an augmented reality (AR) application using the ARCore API. The application will display any detected planes and will allow the user to tap on a plane to place a 3d model of the Android robot.

The documentation for this class was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/HelloArActivity.java`

5.20 com.augmentededucation.ar.augmentededucationar.HomeActivity Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.HomeActivity:



Public Member Functions

- void [ViewInAR](#) ()
- void [scanQRCode](#) (View view)
- void [onSaveInstanceState](#) (Bundle savedInstanceState)
- void [onRequestPermissionsResult](#) (int requestCode, @NonNull String[] permissions, @NonNull int[] grantResults)

Protected Member Functions

- void [onCreate](#) (Bundle savedInstanceState)
- void [onActivityResult](#) (int requestCode, int resultCode, Intent data)

5.20.1 Detailed Description

The Home activity where the list of models and scan QR code button are displayed. Tapping on a button in the list will move to the [ARActivity](#) where the model is displayed. Clicking on the Scan QR code button will move to the [ScanQRCodeActivity](#) where the user can scan a QR code.

5.20.2 Member Function Documentation

5.20.2.1 onActivityResult()

```

void com.augmentededucation.ar.augmentededucationar.HomeActivity.onActivityResult (
    int requestCode,
    int resultCode,
    Intent data ) [protected]
  
```

Catches the result from the QR scanning activity. It will catch all results from the `startActivityForResult` function, so tags need to be set to only catch the results.

Parameters

<i>requestCode</i>	The request code/tag used to specify which call is returning
<i>resultCode</i>	The result to specify success/failure
<i>data</i>	Data returned from the activity

5.20.2.2 onCreate()

```
void com.augmentededucation.ar.augmentededucationar.HomeActivity.onCreate (
    Bundle savedInstanceState ) [protected]
```

Called when the activity is created. It performs the following operations: 1) TODO: Check for permissions, and ask if not granted 2) Add models from the website to the list 3) Add models in the assets folder to the list

TODO: Put in better error messages/toasts

Parameters

<i>savedInstanceState</i>	The bundle if recreating the activity
---------------------------	---------------------------------------

5.20.2.3 onRequestPermissionsResult()

```
void com.augmentededucation.ar.augmentededucationar.HomeActivity.onRequestPermissionsResult (
    int requestCode,
    @NonNull String [] permissions,
    @NonNull int [] grantResults )
```

Called after requesting permissions from the user

TODO: Actually implement permission requests, and handle the results

Parameters

<i>requestCode</i>	Permission requested
<i>permissions</i>	The permissions asked
<i>grantResults</i>	The permissions granted

5.20.2.4 onSaveInstanceState()

```
void com.augmentededucation.ar.augmentededucationar.HomeActivity.onSaveInstanceState (
    Bundle savedInstanceState )
```

If moving away from the activity, save the auth token so future accesses to the sever are allowed.

Parameters

<i>savedInstanceState</i>	The bundle to save the data into
---------------------------	----------------------------------

5.20.2.5 scanQRCode()

```
void com.augmentededucation.ar.augmentededucationar.HomeActivity.scanQRCode (
    View view )
```

Transition to the ScanQRCodeActivity where the user can add a model to the list via a QR code.

Parameters

<i>view</i>	Needed by the onClick to specify which view called it
-------------	---

5.20.2.6 ViewInAR()

```
void com.augmentededucation.ar.augmentededucationar.HomeActivity.ViewInAR ( )
```

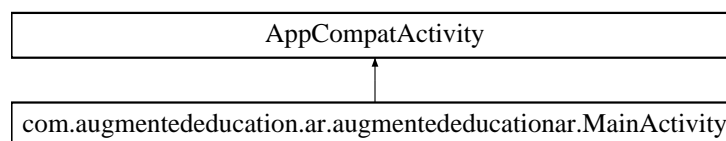
Transition to the [ARActivity](#) when the a model is downloaded and the user wants to view it

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/HomeActivity.java

5.21 com.augmentededucation.ar.augmentededucationar.MainActivity Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.MainActivity:



Public Member Functions

- void [continueOffline](#) (View view)
- void [onNext](#) (View v)

Protected Member Functions

- void [onCreate](#) (Bundle savedInstanceState)

5.21.1 Detailed Description

The first activity when opening the app. There is functionality to authenticate the user to view online content, and an offline mode for no online connectivity.

5.21.2 Member Function Documentation

5.21.2.1 `continueOffline()`

```
void com.augmentededucation.ar.augmentededucationar.MainActivity.continueOffline (
    View view )
```

Do not access the website, just continue without an authentication token.

Parameters

<i>view</i>	The calling view (needed for as an onClick handler).
-------------	--

5.21.2.2 `onCreate()`

```
void com.augmentededucation.ar.augmentededucationar.MainActivity.onCreate (
    Bundle savedInstanceState ) [protected]
```

Creates the activity. Initializes the username/password information if needed.

Parameters

<i>savedInstanceState</i>	The saved state of recreating the activity
---------------------------	--

5.21.2.3 `onNext()`

```
void com.augmentededucation.ar.augmentededucationar.MainActivity.onNext (
    View v )
```

Authenticate with the website and move to the [HomeActivity](#) with the auth token. Saves the username and password in the preferences if the remember me box is checked.

TODO: Make better error statements/toasts

Parameters

v	The calling view.
---	-------------------

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/MainActivity.java

5.22 com.augmentededucation.ar.augmentededucationar.db.entity.Model Class Reference

Public Attributes

- String **url**
- String **name**
- String **location**

5.22.1 Detailed Description

Defines the field names in the [Model](#) entity where [Model](#) refers to the 3D models stored and viewed by the user. This creates a table within the [AppDatabase](#) object to hold [Model](#) objects.

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/db/entity/Model.java

5.23 com.augmentededucation.ar.augmentededucationar.db.dao.ModelDao Interface Reference

Public Member Functions

- List< [Model](#) > **loadAllModels** ()
- List< [Model](#) > **loadModelWhereURL** (String url)
- void **updateModel** (String url, String newName, String newLocation)
- void **insertModel** ([Model](#) model)
- void **deleteModel** ([Model](#) model)
- void **deleteAll** ()

5.23.1 Detailed Description

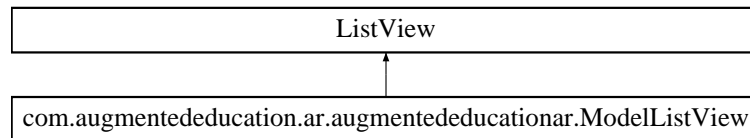
[ModelDao](#) defines the methods used to interact with the database. This DAO corresponds to the [Model](#) entity that is in [AppDatabase](#).

The documentation for this interface was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/db/dao/ModelDao.java
-

5.24 com.augmentededucation.ar.augmentededucationar.ModelListView Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.ModelListView:



Public Member Functions

- void **setFileManager** ([FileManager](#) manager)
- void **setIsLocal** (Boolean isLocal)
- Boolean **getIsLocal** ()
- [ModelListView](#) (Context context)
- [ModelListView](#) (Context context, AttributeSet attrs)
- [ModelListView](#) (Context context, AttributeSet attrs, int defStyle)
- void **add** ([Model](#) model)
- void **clear** ()
- void **refreshList** ()
- [Model](#) **getModel** (int location)

5.24.1 Detailed Description

An extension of a [ListView](#) to list the models available. It provides an easier method for adding models to the list, since there are multiple locations where the models can come from (assets, on the phone, online) and there may be some latency between getting the listings.

The general use overview is: 1) Use [add\(\)](#) to add a model to the list 2) After done adding models to the list (for a time) call [refreshList\(\)](#) to refresh the listing that will show in the view. This is more efficient since refreshing the list means allocating new memory, which can be resource intensive.

5.24.2 Constructor & Destructor Documentation

5.24.2.1 [ModelListView\(\)](#) [1/3]

```
com.augmentededucation.ar.augmentededucationar.ModelListView.ModelListView (
    Context context )
```

Constructor that initializes the context

Parameters

<i>context</i>	Where to show the list
----------------	------------------------

5.24.2.2 ModelListView() [2/3]

```
com.augmentededucation.ar.augmentededucationar.ModelListView.ModelListView (
    Context context,
    AttributeSet attrs )
```

Additional constructor needed by extending ListView

Parameters

<i>context</i>	context
<i>attrs</i>	attributes

5.24.2.3 ModelListView() [3/3]

```
com.augmentededucation.ar.augmentededucationar.ModelListView.ModelListView (
    Context context,
    AttributeSet attrs,
    int defStyle )
```

Additional constructor needed by extending ListView

Parameters

<i>context</i>	context
<i>attrs</i>	attributes
<i>defStyle</i>	defStyle

5.24.3 Member Function Documentation

5.24.3.1 add()

```
void com.augmentededucation.ar.augmentededucationar.ModelListView.add (
    Model model )
```

Add a model to the list. NOTE: This will not reload the list. So an added model will not be shown until [refreshList\(\)](#) is called.

Parameters

<i>model</i>	The model to add to the list
--------------	------------------------------

5.24.3.2 clear()

```
void com.augmentededucation.ar.augmentededucationar.ModelListView.clear ( )
```

Removes all models from the list. NOTE: This will not show in the list until [refreshList\(\)](#) is called.

5.24.3.3 getIsLocal()

```
Boolean com.augmentededucation.ar.augmentededucationar.ModelListView.getIsLocal ( )
```

A getter for the isLocal member variable. Variable used to denote only viewing local or all models.

Returns

isLocal member variable

5.24.3.4 getModel()

```
Model com.augmentededucation.ar.augmentededucationar.ModelListView.getModel (
    int location )
```

A getter to get the model at a location in the list. If the location is out of range, null is returned.

Parameters

<i>location</i>	The location of the model to get
-----------------	----------------------------------

Returns

The model at the desired location

5.24.3.5 refreshList()

```
void com.augmentededucation.ar.augmentededucationar.ModelListView.refreshList ( )
```

Refresh the list with all changes. Call this sparingly as it is fairly resource intensive due to the requirement of allocating new memory.

5.24.3.6 setIsLocal()

```
void com.augmentededucation.ar.augmentededucationar.ModelListView.setIsLocal (
    Boolean isLocal )
```

Setter to only load local models, or show remote as well.

Parameters

<i>isLocal</i>	Set whether to show only local models or not
----------------	--

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/ModelListView.java

5.25 com.augmentededucation.ar.augmentededucationar.ModelListViewTest Class Reference

Public Member Functions

- void **setUp** () throws Exception
- void **constructor** () throws Exception
- void **setIsLocalTrue** () throws Exception
- void **setIsLocalFalse** () throws Exception
- void **add** () throws Exception
- void **clear** () throws Exception
- void **refreshList** () throws Exception
- void **getModel** () throws Exception

5.25.1 Detailed Description

Class to test the [ModelListView](#)

5.25.2 Member Function Documentation

5.25.2.1 add()

```
void com.augmentededucation.ar.augmentededucationar.ModelListViewTest.add ( ) throws Exception
```

TODO: Mock out the [FileManager](#) so it doesn't actually need a database

Exceptions

<i>Exception</i>	
------------------	--

The documentation for this class was generated from the following file:

- app/src/androidTest/java/com/augmentededucation/ar/augmentededucationar/ModelListViewTest.java

5.26 com.augmentededucation.ar.augmentededucationar.arcoring.ObjectRenderer Class Reference ↩

Classes

- enum [BlendMode](#)

Public Member Functions

- [ObjectRenderer](#) ()
- void [createOnGThread](#) (Context context, String objAssetName, String diffuseTextureAssetName) throws IOException ↩
- void [createOnGThread](#) (Context context, String OBJ_PATH) throws IOException
- void [setBlendMode](#) ([BlendMode](#) blendMode)
- void [updateModelMatrix](#) (float[] modelMatrix, float scaleFactor)
- void [setMaterialProperties](#) (float ambient, float diffuse, float specular, float specularPower)
- void [draw](#) (float[] cameraView, float[] cameraPerspective, float lightIntensity)

5.26.1 Detailed Description

Renders an object loaded from an OBJ file in OpenGL.

Many functions in this file were from the original HelloAr project. Some functions to work with .mtl files were added from <https://github.com/JohnLXiang/arcoring-sandbox>. These functions were modified to work with our project and meet our needs.

5.26.2 Constructor & Destructor Documentation

5.26.2.1 ObjectRenderer()

```
com.augmentededucation.ar.augmentededucationar.arcoring.ObjectRenderer.ObjectRenderer
( )
```

Empty Constructor for [ObjectRenderer](#)

5.26.3 Member Function Documentation

5.26.3.1 createOnGThread() [1/2]

```
void com.augmentededucation.ar.augmentededucationar.arcoring.ObjectRenderer.createOnGThread (
    Context context,
    String objAssetName,
    String diffuseTextureAssetName ) throws IOException ↩
```

Creates and initializes OpenGL resources needed for rendering the model. Used by original ARCore example in [HelloArActivity](#).

Parameters

<i>context</i>	Context for loading the shader and below-named model and texture assets.
<i>objAssetName</i>	Name of the OBJ file containing the model geometry.
<i>diffuseTextureAssetName</i>	Name of the PNG file containing the diffuse texture map.

5.26.3.2 createOnGltThread() [2/2]

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.createOnGltThread (
    Context context,
    String OBJ_PATH ) throws IOException
```

Creates and initializes OpenGL resources needed for rendering the model. Can load .obj files and materials from a .mat file and optionally .png files. Taken from <https://github.com/JohnLXiang/arcore-sandbox> and edited to work for us.

Parameters

<i>context</i>	Context for loading the shader and below-named model and texture assets.
<i>OBJ_PATH</i>	Obj file path

5.26.3.3 draw()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.draw (
    float [] cameraView,
    float [] cameraPerspective,
    float lightIntensity )
```

Draws the model.

Parameters

<i>cameraView</i>	A 4x4 view matrix, in column-major order.
<i>cameraPerspective</i>	A 4x4 projection matrix, in column-major order.
<i>lightIntensity</i>	Illumination intensity. Combined with diffuse and specular material properties.

See also

[setBlendMode\(BlendMode\)](#)
[#updateModelMatrix\(float\[\], float\)](#)
[setMaterialProperties\(float, float, float, float\)](#)
[android.opengl.Matrix](#)

5.26.3.4 setBlendMode()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.setBlend↵
Mode (
    BlendMode blendMode )
```

Selects the blending mode for rendering.

Parameters

<i>blendMode</i>	The blending mode. Null indicates no blending (opaque rendering).
------------------	---

5.26.3.5 setMaterialProperties()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.set↵
MaterialProperties (
    float ambient,
    float diffuse,
    float specular,
    float specularPower )
```

Sets the surface characteristics of the rendered model.

Parameters

<i>ambient</i>	Intensity of non-directional surface illumination.
<i>diffuse</i>	Diffuse (matte) surface reflectivity.
<i>specular</i>	Specular (shiny) surface reflectivity.
<i>specularPower</i>	Surface shininess. Larger values result in a smaller, sharper specular highlight.

5.26.3.6 updateModelMatrix()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.ObjectRenderer.update↵
ModelMatrix (
    float [] modelMatrix,
    float scaleFactor )
```

Updates the object model matrix and applies scaling.

Parameters

<i>modelMatrix</i>	A 4x4 model-to-world transformation matrix, stored in column-major order.
<i>scaleFactor</i>	A separate scaling factor to apply before the modelMatrix .

See also

android.opengl.Matrix

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/rendering/ObjectRenderer.↵
java

5.27 com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor.↵ onDownloadError Interface Reference

Public Member Functions

- void **onError** ()

5.27.1 Detailed Description

An interface that will be called when an error occurs

The documentation for this interface was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/WebAccess/WebAccessor.java

5.28 com.augmentededucation.ar.augmentededucationar.arcore.rendering.PlaneRenderer Class Reference

Classes

- class **SortablePlane**

Public Member Functions

- void [createOnGithread](#) (Context context, String gridDistanceTextureName) throws IOException
- void [drawPlanes](#) (Collection< Plane > allPlanes, Pose cameraPose, float[] cameraPerspective)

5.28.1 Detailed Description

Renders the detected AR planes.

5.28.2 Member Function Documentation

5.28.2.1 createOnGithread()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.PlaneRenderer.createOn↵  
Githread (
```

```
    Context context,  
    String gridDistanceTextureName ) throws IOException
```

Allocates and initializes OpenGL resources needed by the plane renderer. Must be called on the OpenGL thread, typically in GLSurfaceView.Renderer#onSurfaceCreated(GL10, EGLConfig).

Parameters

<i>context</i>	Needed to access shader source and texture PNG.
<i>gridDistanceTextureName</i>	Name of the PNG file containing the grid texture.

5.28.2.2 drawPlanes()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.PlaneRenderer.drawPlanes
(
    Collection< Plane > allPlanes,
    Pose cameraPose,
    float [] cameraPerspective )
```

Draws the collection of tracked planes, with closer planes hiding more distant ones.

Parameters

<i>allPlanes</i>	The collection of planes to draw.
<i>cameraPose</i>	The pose of the camera, as returned by Camera#getPose()
<i>cameraPerspective</i>	The projection matrix, as returned by Camera#getProjectionMatrix(float[], int, float, float)

The documentation for this class was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/rendering/PlaneRenderer.java`

5.29 com.augmentededucation.ar.augmentededucationar.arcore.rendering.PointCloudRenderer Class Reference

Public Member Functions

- void `createOnGUIThread` (Context context)
- void `update` (PointCloud cloud)
- void `draw` (float[] cameraView, float[] cameraPerspective)

5.29.1 Detailed Description

Renders a point cloud.

5.29.2 Member Function Documentation

5.29.2.1 createOnGltThread()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.PointCloudRenderer.↔
createOnGltThread (
    Context context )
```

Allocates and initializes OpenGL resources needed by the plane renderer. Must be called on the OpenGL thread, typically in GLSurfaceView.Renderer#onSurfaceCreated(GL10, EGLConfig).

Parameters

<i>context</i>	Needed to access shader source.
----------------	---------------------------------

5.29.2.2 draw()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.PointCloudRenderer.draw (
    float [] cameraView,
    float [] cameraPerspective )
```

Renders the point cloud. ArCore point cloud is given in world space.

Parameters

<i>cameraView</i>	the camera view matrix for this frame, typically from com.google.ar.core.Camera#getViewMatrix(float[], int).
<i>cameraPerspective</i>	the camera projection matrix for this frame, typically from com.google.ar.core.Camera#getProjectionMatrix(float[], int, float, float).

5.29.2.3 update()

```
void com.augmentededucation.ar.augmentededucationar.arcore.rendering.PointCloudRenderer.update
(
    PointCloud cloud )
```

Updates the OpenGL buffer contents to the provided point. Repeated calls with the same point cloud will be ignored.

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcore/rendering/PointCloudRenderer.java

5.30 com.augmentededucation.ar.augmentededucationar.barcode.ScanQRCodeActivity Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.barcode.ScanQRCodeActivity:



Public Member Functions

- void [onDetectedQrCode](#) (Barcode barcode)
- void [onRequestPermissionsResult](#) (int requestCode, @NonNull String[] permissions, @NonNull int[] grantResults)

Static Public Attributes

- static final String **BarcodeObject** = "Barcode"

Protected Member Functions

- void [onCreate](#) (Bundle savedInstanceState)
- void **onResume** ()
- void **onPause** ()
- void [onDestroy](#) ()

5.30.1 Detailed Description

Activity starts camera after receiving permissions. It detects barcodes, creates an intent with the barcode, and returns the intent as the activity's result.

5.30.2 Member Function Documentation

5.30.2.1 onCreate()

```
void com.augmentededucation.ar.augmentededucationar.barcode.ScanQRCodeActivity.onCreate (
    Bundle savedInstanceState ) [protected]
```

Initializes the UI and creates the barcode detector pipeline

Parameters

<i>savedInstanceState</i>	The bundle used if the activity is going to be recreated
---------------------------	--

5.30.2.2 onDestroy()

```
void com.augmentededucation.ar.augmentededucationar.barcode.ScanQRCodeActivity.onDestroy ( )
[protected]
```

Releases the resources associated with the camera source, the associated detectors, and the rest of the processing pipeline.

5.30.2.3 onDetectedQrCode()

```
void com.augmentededucation.ar.augmentededucationar.arcoring.Rendering.ShaderUtil.onDetectedQrCode (
    Barcode barcode )
```

Checks that the barcode is not null and creates a new intent with the barcode. Returns the intent and a success code as the result that the activity returns to its caller.

Parameters

<i>barcode</i>	The barcode object that has been detected
----------------	---

Implements [com.augmentededucation.ar.augmentededucationar.arcoring.Rendering.ShaderUtil.BarcodeTracker.BarcodeGraphicTrackerCallback](#).

5.30.2.4 onRequestPermissionsResult()

```
void com.augmentededucation.ar.augmentededucationar.arcoring.Rendering.ShaderUtil.onRequestPermissionsResult (
    int requestCode,
    @NonNull String [] permissions,
    @NonNull int [] grantResults )
```

Callback for the result from requesting permissions. This method is invoked for every call on `requestPermissions(String[], int)`.

Note: It is possible that the permissions request interaction with the user is interrupted. In this case you will receive empty permissions and results arrays which should be treated as a cancellation.

Parameters

<i>requestCode</i>	The request code passed in <code>requestPermissions(String[], int)</code> .
<i>permissions</i>	The requested permissions. Never null.
<i>grantResults</i>	The grant results for the corresponding permissions which is either <code>PackageManager#PERMISSION_GRANTED</code> or <code>PackageManager#PERMISSION_DENIED</code> . Never null.

See also

`#requestPermissions(String[], int)`

The documentation for this class was generated from the following file:

- `app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcoring/Rendering/ShaderUtil.java`

5.31 com.augmentededucation.ar.augmentededucationar.arcoring.Rendering.ShaderUtil Class Reference

Static Public Member Functions

- static int [loadGLShader](#) (String tag, Context context, int type, int resId)
- static void [checkGLError](#) (String tag, String label)

5.31.1 Detailed Description

Shader helper functions.

5.31.2 Member Function Documentation

5.31.2.1 checkGLError()

```
static void com.augmentededucation.ar.augmentededucationar.arcore.rendering.ShaderUtil.checkGLError (
    String tag,
    String label ) [static]
```

Checks if we've had an error inside of OpenGL ES, and if so what that error is.

Parameters

<i>label</i>	Label to report in case of error.
--------------	-----------------------------------

Exceptions

<i>RuntimeException</i>	If an OpenGL error is detected.
-------------------------	---------------------------------

5.31.2.2 loadGLShader()

```
static int com.augmentededucation.ar.augmentededucationar.arcore.rendering.ShaderUtil.loadGLShader (
    String tag,
    Context context,
    int type,
    int resId ) [static]
```

Converts a raw text file, saved as a resource, into an OpenGL ES shader.

Parameters

<i>type</i>	The type of shader we will be creating.
<i>resId</i>	The resource ID of the raw text file about to be turned into a shader.

Returns

The shader object handler.

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcoring/ShaderUtil.java

5.32 com.augmentededucation.ar.augmentededucationar.arcoring.TGAREader Class Reference

Static Public Member Functions

- static int **getWidth** (byte[] buffer)
- static int **getHeight** (byte[] buffer)
- static int [] **read** (byte[] buffer, Order order) throws IOException

Static Public Attributes

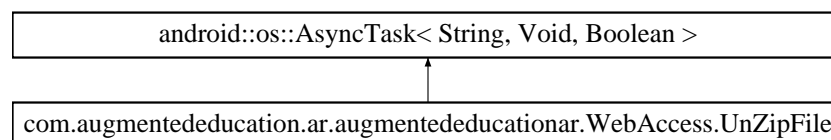
- static final Order **ARGB** = new Order(16, 8, 0, 24)
- static final Order **ABGR** = new Order(0, 8, 16, 24)

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/arcoring/TGAREader.java

5.33 com.augmentededucation.ar.augmentededucationar.WebAccess.UnZipFile Class Reference

Inheritance diagram for com.augmentededucation.ar.augmentededucationar.WebAccess.UnZipFile:



Classes

- interface [ZipComplete](#)

Public Member Functions

- [UnZipFile](#) ([ZipComplete](#) complete)

Protected Member Functions

- Boolean [doInBackground](#) (String... params)
 - void [onPostExecute](#) (Boolean result)
-

5.33.1 Detailed Description

Class to unzip a folder. Executes asynchronously as to not block the calling thread.

5.33.2 Constructor & Destructor Documentation

5.33.2.1 UnZipFile()

```
com.augmentededucation.ar.augmentededucationar.WebAccess.UnZipFile.UnZipFile (
    ZipComplete complete )
```

Constructor to set the [ZipComplete](#) action.

Parameters

<i>complete</i>	Instance of the ZipComplete that will be executed when done trying to unzip.
-----------------	--

5.33.3 Member Function Documentation

5.33.3.1 doInBackground()

```
Boolean com.augmentededucation.ar.augmentededucationar.WebAccess.UnZipFile.doInBackground (
    String... params ) [protected]
```

Perform the unzipping asynchronously.

Parameters

<i>params</i>	params[0] = source path, params[1] = destination path
---------------	---

Returns

True if successful, false otherwise

5.33.3.2 onPostExecute()

```
void com.augmentededucation.ar.augmentededucationar.WebAccess.UnZipFile.onPostExecute (
    Boolean result ) [protected]
```

After executing, call execute the [ZipComplete](#) interface.

Parameters

<i>result</i>	The result of unzipping, True = success, False = otherwise
---------------	--

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/WebAccess/UnZipFile.java

5.34 com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor Class Reference

Classes

- interface [DownloadQueued](#)
- enum [FileDescriptor](#)
- interface [onDownloadError](#)

Public Member Functions

- [WebAccessor](#) (Context context)
- void [authenticate](#) (String username, String password, Response.Listener< JSONObject > listener, Response.ErrorListener eListener)
- void [getAllModelsListing](#) (final String authToken, [FileDescriptor](#) types, Response.Listener< JSONObject > listener, Response.ErrorListener eListener)
- void [downloadFile](#) (final Context context, final String authToken, final String uri, final String destName, final [DownloadQueued](#) queued, [onDownloadError](#) downloadError)

5.34.1 Detailed Description

A class to handle communication with the website. The Volley library is used to perform the network operations. The callbacks needed by Volley for a completed or error condition must be provided by the calling class.

5.34.2 Constructor & Destructor Documentation

5.34.2.1 WebAccessor()

```
com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor.WebAccessor (
    Context context )
```

The constructor to set up the DownloadManager and RequestQueue

Parameters

<i>context</i>	context to create the DownloadManager and RequestQueue from
----------------	---

5.34.3 Member Function Documentation

5.34.3.1 authenticate()

```
void com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor.authenticate (
    String username,
    String password,
    Response.Listener< JSONObject > listener,
    Response.ErrorListener eListener )
```

Authenticate a user with a username and password. A successful response will send an authentication token back that must be used for other requests to the website.

Parameters

<i>username</i>	The username of the user
<i>password</i>	The password of the user
<i>listener</i>	A listener to accept a response from the website
<i>eListener</i>	An error listener if an error occurs during communication

TODO: Setup/use TLS/SSL on both the web and mobile side

5.34.3.2 downloadFile()

```
void com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor.downloadFile (
    final Context context,
    final String authToken,
    final String uri,
    final String destName,
    final DownloadQueued queued,
    onDownloadError downloadError )
```

Downloads a file from the website. There are two steps to download a file: 1) Contact the server at a predefined URL to get the actual download URL 2) Download the file from the download URL provided in step 1

Parameters

<i>context</i>	The context to make Toasts if errors occur
<i>authToken</i>	The auth token to communicate with the server
<i>uri</i>	The URI/name of the file to download
<i>destName</i>	The folder name to save the file into
<i>queued</i>	An instance of an interface for when a download is complete
<i>downloadError</i>	A callback to call if an error occurs

5.34.3.3 getAllModelsListing()

```
void com.augmentededucation.ar.augmentededucationar.WebAccess.WebAccessor.getAllModelsListing
(
    final String authToken,
    FileDescriptor types,
    Response.Listener< JSONObject > listener,
    Response.ErrorListener eListener )
```

Retrieve a listing of models that a user owns, from the website. A call to authenticate to get an auth token must be performed before this will succeed.

Parameters

<i>authToken</i>	The auth token retrieved from a call to authenticate
<i>types</i>	The type of file to be shown (an enum defined in this class)
<i>listener</i>	The response listener to handle a successful request
<i>eListener</i>	The error listener that is called when an error occurs during execution

The documentation for this class was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/WebAccess/WebAccessor.java

5.35 com.augmentededucation.ar.augmentededucationar.WebAccess.UnZipFile.ZipComplete Interface Reference

Public Member Functions

- void **onZipComplete** (Boolean result)

5.35.1 Detailed Description

An interface where the function onZipComplete will be called after an unzip attempt.

The documentation for this interface was generated from the following file:

- app/src/main/java/com/augmentededucation/ar/augmentededucationar/WebAccess/UnZipFile.java
-

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