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| DEVELOPER MANUAL  ATON (Alert about Threaten Objects Near you) | Hugo BALTZ |
|  | 8/17/2016 |

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# Important notes:

This application has been developed on Android Studio 2.1.1.

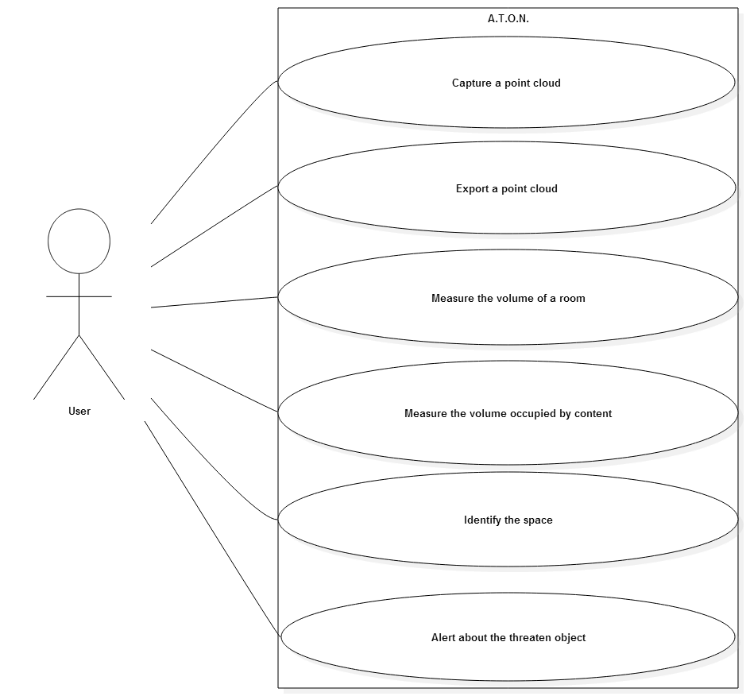
The minimum SDK version to launch the application is 17, and the target SDK is 19.

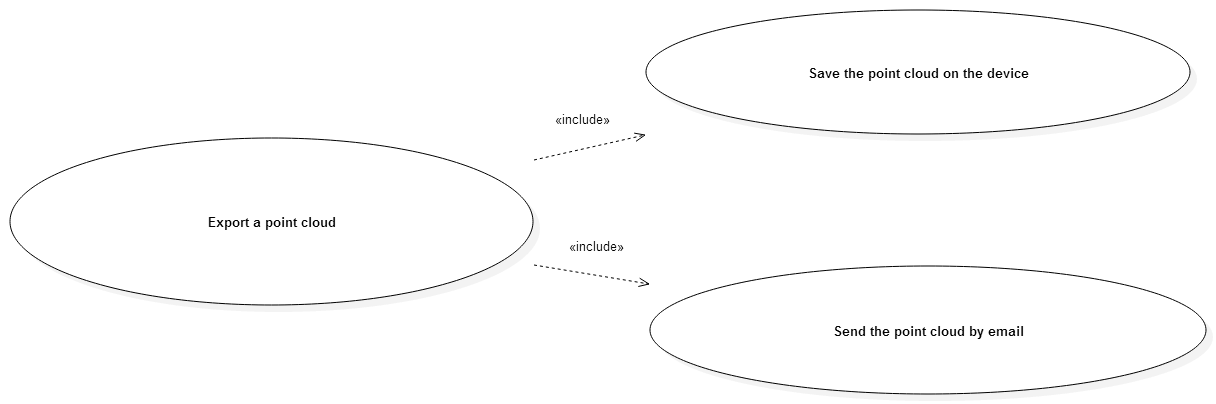
This application uses the library tango support, Tango SDK Qianru Java, and the library rajawali 3D V1.0.325.

My report explains the theoretical solution, in this documentation I don’t explain in detailes the methods, only how I implemented them.

# Introduction:

This application acquires a point cloud, stores the point cloud on the device, can delete the point cloud on the device, calculates the volume of a room (using the point cloud of the room), in the future it will calculate the volume occupied of the room, will determine the type of the room and if an object is dangerous in case of an earthquake.





# Code structure:

You will find the detail of each class in the Javadoc of this project, If you have question you can contact me at [hugo.baltz@gmail.com](mailto:hugo.baltz@gmail.com).

The code is divided in eight parts; I explain in this paragraph the interest of each of this party.

## Rajawali:

It is a library of the project tango, I add it in the project, because Android studio did not succeed to build my project with this library on the dependencies. I will not develop how this part works. I use this library to manage the point cloud and the augmented reality.

## MainActivity:

It is the activity that initialize the project: it starts the AR (Augmented Reality), setups the extrinsic, creates the menu, initializes the listener on the button of the menu.

## Renderer:

This folder contains the classes that manage the point clouds, and specifically all the visual aspect in the AR but also the actions associates to each buttons of the menu (see the user manual).

### Materials:

This class contains the materials that define the aspect of the point clouds, specifically the color of the point clouds.

### PointCloudARRender:

This class extends the renderer TangoRajawaliRenderer, it manages everything that it dispaly on the screen, such as the point cloud created by the device, the point cloud collected by the application, and it manages the action links to the menu.

### PointCollection:

This class extends the class Object3D (org.rajawali3d.Object3D), it corresponds to the point clouds. The fields of this class are a FloatBuffer: the point cloud, an integer mMaxNumberOfVertices which defines the maximum of points in the point cloud, and an integer count which is the number of points in the point cloud.

## Utilities:

This folder contains the classes that are useful to other classes.

### PointCloudExporter:

This class manages the exportation of a file, it is this class that write on the internal memory the .xyz.

### PointCloudManger:

This class manages the point cloud, it fills the current points (the ones that are create by the device) and it fills the collected points (the ones store on the device).

### PointCloudVolumeCalculator:

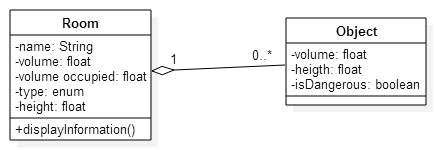
This class manages the calculation of the volume of a room and displays the results on the screen.

### Various:

This class contains several useful functions that can be use by the others classes of the applications.

## Object:

This folder contains the classes Room and Object:



## Polygon:

This folder contains the classes useful to create a polygon.

### Point:

This class has two fields X and Y (two floats).

### Line:

This class uses the class point; a line is formed by two points.

### Polygon:

This class uses the line class; a polygon is defined by his sides which are line.

### Angle:

This class is useful for the JarvisMarch algorithm which is an algorithm to calculate the convex hull of a finite number of points.

## Provider:

This folder contains only the class MailProvider.

This class is useful to send an email with an attachment which is on the internal storage of the device.

## Hull:

This folder contains the class JarvisMarch.

This class implements the algorithm of Jarvis’ march which is an algorithm that calculate the convex hull of a finite number of points.

# How the application works:

# Notes:

I think that the rest of the code is easily comprehensible, if I am wrong, please contact me by e-mail at [hugo.baltz@gmail.com](mailto:hugo.baltz@gmail.com),.