

Thesis Outline

Abstract:

To create and test an augmented reality android application capable of utilising Google Project Tango's SLAM (simultaneous location and mapping) features to create an accurate digital representation (i.e mesh) of a real world scene. This mesh will then be used as input to a sound propagation model (ray tracing / image source) that takes into account parameters of the source, listener and room geometry to create an accurate estimation of the impulse response. Possible questions that arise and could therefore be tackled with this project are: does having an accurate IR in an augmented reality context improve user immersion / source localisation, do AR artefacts need to sound as if they are coming from the exact same physical space, do we need to exaggerate certain characteristics of the impulse response, or can we get away with generalised versions of the model (i.e stock IR's for small/big rooms).

Themes/Topics:

Augmented Reality, Sound Propagation, 3D Audio, Spatial Sound, Immersive Audio, Ray Tracing, Image Source, SLAM

Technology:

Software:

Google Tango SDK : Google API (C,C++,Java and Unity) to utilise the motion tracking / area learning and depth perception features on tango enabled devices. Looking through the documentation / examples it is possible to get mesh/.obj files through this API.

Hardware: (one of the following)

Lenovo Phab 2 Pro (preferred)

Google Tango Tablet Dev Kit (no longer highlighted on tango website)

Asus ZenFone AR (not yet released)

Timeline:

Depending on when the hardware is available (this table estimates before the start of march). Different sections of the thesis are going to be written as I proceed (i.e writing up the implementation / state of the art as I go along).

Date	Duration	Goal
01/03/2017	~1 month (maybe too long?)	Literature review / state of the art / Research etc
14/03/2017	~2 weeks	Find a way to use the spatial mapping feature to obtain meshes of the environment
01/04/2017	~2 weeks	Finalise core visuals of the app (i.e having virtual objects appear)
01/05/2017	~1 month	Implement chosen sound propagation algorithm (image source / raytrace)
14/05/2017	~2 weeks (maybe too short?)	User Tests + First Draft of Thesis
02/06/2017	~3 weeks	Hand In