

**FIT DEPARTMENT**

Computer Science and System Design

Software and Hardware Development

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**Project #6: “Rendering” Vision Document**

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It is impossible to imagine the modern world without 3D graphics. The movies, web sites, all the games we like so much filled with it. However, sadly, not everyone is able to create something like that – the bulk of apps that work with 3D graphics are quite challenging to use. The user needs to spend hours to investigate and learn the interface and all the functions in order to create a realistic model.

Our team is planning to create an app that works with 3D graphics based on Ray tracing, a method that simulates the behavior of light as realistic as possible. The quality of the image rendered by this method is much better then than an image rendered in some other way. In these other methods (like ray casting) no reflections, refractions or hard shadows are possible. Does that remind you something? (Doom) But we’ll dictate the behavior of ray by setting the material. A material dictates how light should be reflected or maybe absorbed or maybe the light goes through the material. There will be billions of these bounces drawing our scene. We’ll reproduce many optical effects that are difficult to achieve by other methods: shadowing, depth of space, caustic and indirect lighting. Implementing these optical effects using Ray tracing is much simpler than using other techniques. And it is thanks to it that we can create something truly indistinguishable from reality.

For us, the prior task is to produce an accessible app to work with 3D graphics with a plain interface that would be clear even to a child. You give a program just a model, and at the output you have realistic image. Pretty simple, isn’t it?

We are willing to make our app as accessible for everyone as possible. It will be used in any possible ways – from rendering the simplest geometrical models with realistic structure to creating awesome images with many different objects.

Subsequently, we are planning to improve the system of Ray tracing in order to make even more efficient and, therefore, even more accessible.