

# **Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

*Department of Information Engineering*



**Bachelor Thesis Abstract**

**Modern Means of Creating 3D Graphics Applications**

**Nzube Victor Okoye**

© 2015 CULS, Prague

## **Summary**

Creating 3D graphics used to be a daunting task and personal computers did not have the processing capacity for handling it; but with the progress in computer architecture- software and hardware, this has become much easier. This thesis deals with 3D graphics creation starting from its basic definition to the underlying technology and finally the current available means for creating 3D graphics application.

The first part of the thesis deals with the well known application programming interface. The second part highlights the system software available to users today for creating 3D graphics. The third part is a practical demonstration of 3D graphics applications that can be created using these modern system software.

## **Keywords**

3D graphics, 3D model, Unity Game Engine, Game development, C#, Artificial Intelligence, 3ds Max

## **Extended Abstract**

Just like many other fields in computer science, creation of 3D graphics application has in recent time become a lot easier with the innovative development of system software and frameworks that utilizes the underlying application programming interface and technologies to simplify the processes.

Most of the system software is built with modern-day graphics architecture which creates very realistic graphics with extended capabilities which allows for programming and animation using the same tools while others support a seamless importation of files created in other graphics software.

## **Goals**

The goal of this thesis is to discuss the underlying technologies and application programming interface for creating 3D graphics and subsequently implement 3D graphics applications using the modern 3D graphics frameworks available to users today.

## **Methodology**

The theoretical part of the thesis is made of desk research including: summary, synthesis and collation of relevant literature and resources.

The practical part will be a demonstration of how to create 3D graphics application using the one of the modern tools discussed in the theoretical part. The demonstration will be done using different self-authored video games.

## **Conclusion**

The first objective of this thesis was to describe the existing technologies for creating 3D graphics application. This was accomplished in the first part of the third chapter. This was done by studying extensively, different literatures and reviewing them through secondary research techniques.

The second goal was to highlight all the modern tools- system software or computer programs available for easy creation of 3D graphics. This was also done in the second part of the third chapter.

My final goal was to describe how using one of the modern system software mentioned in the theoretical part to demonstrate how modern system software can make the creation of 3D graphics application easy. This was done using two examples as shown in the fourth chapter. Finally, a 3D game environment was simulated and deployed. This was done so as to further illustrate the 3D creation tools available within the game engine that was used for the design and implementation.

In conclusion, as a result of this thesis, it is possible to say that the tools available to designers, developers, programmers and any user that works with 3D graphics makes for a very easy workflow and their value as they continue to progress in line with new technological innovations cannot be under-estimated.

# Bibliography

**Giambruno, Mark. 2002.** *3D Graphics and Animation*. Oaks, CA : New Riders Publishing, 2002. 978-0735712430.

**Goldstone, Will. 2009.** *Unity Game Developmet Essentials*. Birmingham : Packt Publishing, 2009. 978-1-847198-18-1.

**Gortler, Steven J. 2012.** *Foundations of 3D Computer Graphics*. Cambridge, MA : The MIT Press, 2012. 978-0262017350.

**Hees , H. 2006.** *3D Computer Graphics*. Mainz : Pedia Press, 2006. uidrpggpwhpwilvl.

**Hughes, John F. , et al. 2014.** *Computer Graphics: Principles and Practice*. Third. Willard : Addison-Wesley Professional, 2014. 978-0321399526.

**www.microsoft.com.** DirectX SDK Readme. *Microsoft.* [Online]  
<http://msdn.microsoft.com/directx/sdk/readmepage>.

**Segal, Mark and Akeley, Kurt. 2015.** *OpenGL 4.5 Core Profile*. s.l. : The Khronos Group Inc, 2015.

**www.unity.com.** Unity Manual. *www.doc.unity3d.com.* [Online] Unity.  
<http://docs.unity3d.com/Manual/LearningtheInterface.html>.