

3D games programming - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	3D games programming
Kod przedmiotu	11.2-WE-INFP-ProgramG3D-Er
Wydział	Wydział Nauk Inżynieryjno-Technicznych
Kierunek	Informatyka
Profil	ogólnoakademicki
Rodzaj studiów	Program Erasmus pierwszego stopnia
Semestr rozpoczęcia	semestr zimowy 2021/2022

Informacje o przedmiocie	
Semestr	5
Liczba punktów ECTS do zdobycia	7
Typ przedmiotu	obieralny
Język nauczania	angielski
Sylabus opracował	<ul style="list-style-type: none">dr hab. inż. Marek Sawerwain, prof. UZ

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	30	2	-	-	Egzamin
Laboratorium	30	2	-	-	Zaliczenie na ocenę
Projekt	15	1	-	-	Zaliczenie na ocenę

Cel przedmiotu

- to familiarize students with the capabilities of 3D game programming environments, including the most popular development environments designed for game programming developing,
- presentation of application architecture, component model, and review of Entity Component System,
- shaping the basic skills of 3d game programming and create awareness of main notions used in modern 3d game systems.

Wymagania wstępne

Computer graphics, Object oriented programming

Zakres tematyczny

A brief overview of the main stages in the history of computer game development. Especially highlighting the development of 3D interactive graphics.

Existing systems and environments for 3D game programming. Examples of applications/packages supporting the development of applications with interactive 3D graphics.

Interactive computer 3D graphics. Geometric modelling, transformation and navigation in 3D space. Virtual reality as interactive 3D environment. Representation of 3D space. Construction and placement basic 3D elements. Methods of modifying of 3d objects. Representation of 3D objects -- shading and lighting. Mesh construction. Terrain component.

Animation and interactions in 3D game environment. Movement keying, simulation of move based on physics models. System of collision detection. Animation of position, rotating and scale. Interaction of user.

Tools supports of 3D game developing and programming. Performance of real-time applications. Techniques of 3d graphics scene optimization like occlusion culling, level of details. Scripting in 3D game systems.

Component and data model in 3D game. Application of Entity Component System pattern in computer games.

Selected aspects of networking in 3D games. Server and client creation. Overview of basic algorithms for synchronizing position of player in a 3D environment across the network.

Metody kształcenia

Lecture: conventional lecture

Laboratory: laboratory exercises, group work

Project: project method, discussions and presentations

Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbol efektów	Metody weryfikacji	Forma zajęć
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Opis efektu	Symbol efektów Metody weryfikacji	Forma zajęć
Student can evaluate of a 3D game application (criticise its contents, technical quality and evaluate the method of its preparing).	<ul style="list-style-type: none"> • sprawdzian z progami punktowymi 	<ul style="list-style-type: none"> • Wykład
Can prepare a sample or prototype of computer game in selected development environment	<ul style="list-style-type: none"> • projekt 	<ul style="list-style-type: none"> • Projekt
Can use advanced features of programming and developing tools for creation of a game with 3D graphics	<ul style="list-style-type: none"> • obserwacja i ocena aktywności na zajęciach • sprawdzian z progami punktowymi 	<ul style="list-style-type: none"> • Laboratorium
Student is able to plan and carry out multi-stage work schedule of 3D game project.	<ul style="list-style-type: none"> • sprawdzian z progami punktowymi 	<ul style="list-style-type: none"> • Wykład

Warunki zaliczenia

Lecture - obtaining a positive grade in written exam.

Laboratory - the main condition to get a pass are sufficient marks for all exercises and tests conducted during the semester.

Project - a condition of pass is to obtain positive marks from all project tasks and preparation written report of project.

Calculation of the final grade: = lecture 30% + laboratory 30% + project 40%.

Literatura podstawowa

1. Hardman, C.: Game Programming with Unity and C#, Apress, 2020.
2. Ross, J.: Unity i C#. Praktyka programowania gier, Helion, 2020.
3. Lintrami T.: Unity 5.x Game Development Essentials, Packt Publishing, 3rd ed., 2017.
4. Rhodes G.: Unity 5.X 2D Game Development By Example, Packt Publishing, 2nd ed., 2017.
5. Hocking J.: Unity in Action: Multiplatform Game Development in C# with Unity 5, Manning Publications; 2015.
6. Nystrom, R: Game Programming Patterns, Genever Benning, 2014.
7. Vince J.: Virtual Reality Systems, Addison Wesley, Cambridge, 1995.

Literatura uzupełniająca

1. Kalwick D.: Animating Facial Features & Expressions, Charles River Media; 2nd ed., 2006.
2. Creighton R.H, Unity 4.x Game Development by Example: Beginner's Guide, Pack Pub, 2013.
3. Pereira V., Learning Unity 2D Game Development by Example, Pack Pub, 2014.
4. Smith S., Queiroz C., Unity 4.x Cookbook, Pack Pub, 2013.

Uwagi

-- no comments --

Zmodyfikowane przez dr hab. inż. Marek Sawerwain, prof. UZ (ostatnia modyfikacja: 15-07-2021 22:04)

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