



Australian Government

ICTGAM556 Develop and implement physics in 3-D digital games

Release: 1

ICTGAM556 Develop and implement physics in 3-D digital games

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 6.0.

Application

This unit describes the skills and knowledge required to integrate a physics, and rendering, engine into a 3-D digital game.

The unit applies to those with high-level technical and mathematical skills working as game engine developers, gameplay programmers and other personnel working in the game development industry.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Develop a game world system	1.1 Develop code and create instances of rendering engine 1.2 Develop scene manager and physics engine's world objects 1.3 Constrain frame rate to a desired frame rate
2. Develop components	2.1 Create and implement game physics system requirements 2.2 Implement game object primitives 2.3 Use physics debugger and show collision frames
3. Develop constraint dynamics	3.1 Generate required game objects and physics bodies constrained by joints and springs 3.2 Build ragdoll using game physics system
4. Develop physics interactivity	4.1 Ray cast scene

ELEMENT	PERFORMANCE CRITERIA
	4.2 Implement player-controlled model 4.3 Implement and develop required game physics system models
5. Develop an interactive scene	5.1 Build scene 5.2 Use trigger volumes to fire off events 5.3 Capture the collision events with call-backs 5.4 Respond to collision events
6. Compile a report	6.1 Build class diagrams for required objects 6.2 Document methodologies used to create interactivity 6.3 Document inventory of utilised objects and how they were used 6.4 Document libraries used 6.5 Submit documentation to required personnel and seek and respond to feedback

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

SKILL	DESCRIPTION
Numeracy	• Uses complex physics to simulate the world by creating mathematical models which measure mass • Computes algorithms to regulate time and speed • Interprets matrix-related functions to determine rate and scale • Completes algorithmic geometry to determine the relationship between points, angles, lines, surfaces and solids
Reading	• Recognises and interprets technical, manufacturer and organisational documentation to determine and confirm job requirements
Writing	• Creates cohesive and well-structured documents using required spelling and grammar, together with required programming code, syntax and conventions
Planning and organising	• Plans, organises and completes work according to defined requirements and schedules
Problem solving	• Uses the key features of, specific digital systems and tools, and operates them effectively to complete design tasks • Uses creativity and initiative in the application of game physics • Uses a systematic process to evaluate work, implement

SKILL	DESCRIPTION
	improvements and solve problems
Self-management	• Takes full responsibility for identifying and considering organisational protocols and requirements

Unit Mapping Information

Supersedes and is equivalent to ICTGAM530 Develop and implement physics in a 3-D digital game.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTGAM556 Develop and implement physics in 3-D digital games

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- identify, evaluate, and develop one interactive game that implements game physics on at least two occasions.

In the course of the above, the candidate must:

- use and document a physics library.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- basic programming techniques needed to develop game objects
- integration issues of common physics concepts in games design
- industry standard game-play hardware and software products, including any technical constraints they impose on design and development
- human resources required in the process of creating a game
- techniques for applying concept development and visualisation skills.

Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- suitable development environment
- physics libraries
- computer hardware and software
- games engine

- file storage.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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