



Australian Government

ICTGAM530 Develop and implement physics in a 3-D digital game

Release: 1

ICTGAM530 Develop and implement physics in a 3-D digital game

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

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

It applies to individuals 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 using a programming language and create instances of the rendering engine, the scene manager and physics engine's world objects 1.2 Constrain the frame rate to a desired frame rate
2. Develop components to support game world creation using physics	2.1 Create and implement the game physics system 2.2 Implement the game object primitives 2.3 Use or develop a physics debugger to show collision frames

ELEMENT	PERFORMANCE CRITERIA
3. Develop an understanding of constraint dynamics	3.1 Generate game objects or physics bodies constrained by joints 3.2 Build a ragdoll using the game physics system
4. Develop an understanding of physics interactivity	4.1 Use the game physics system to ray cast the scene 4.2 Implement a player-controlled model 4.3 Implement and develop game physics system models
5. Develop an interactive scene	5.1 Use primitives to build a scene 5.2 Use trigger volumes to fire off events 5.3 Capture the collision events with call-backs 5.4 Use a toggle for collision frames
6. Compile a report	6.1 Build class diagrams for all objects 6.2 Describe the techniques used to create interactivity 6.3 Describe the objects and when they were used 6.4 Document the libraries used

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.1, 2.1, 2.3, 6.1, 6.2, 6.3, 6.4	• Uses technical terminology to document reports • Uses the appropriate programming code, syntax and conventions to develop the game
Numeracy	1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.3, 5.1, 5.2, 5.3	• 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
Get the work done	1.1, 1.2, 2.1-2.3, 3.1, 3.2, 4.1-4.3, 5.1-5.4,	• Plans, organises and completes work according to defined requirements and schedules

	6.1-6.4	• Uses a systematic process to evaluate work, implement improvements and solve problems • Uses creativity and initiative in the application of game physics • Uses the key features of, specific digital systems and tools, and operates them effectively to complete design tasks
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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM530 Develop and implement physics in a 3-D digital game	ICAGAM530A Develop and implement physics in a 3-D digital game	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for ICTGAM530 Develop and implement physics in a 3-D digital game

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Performance Evidence

Evidence of the ability to:

- develop and document an interactive game that implements game physics
- identify, evaluate, and use a physics library.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

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

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- suitable development environment
- physics libraries
- computer hardware and software
- games engines
- file storage.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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