

Interactive App & Video Game Development Scorecard

Items Evaluated	Contestant Team Number													
	101	102	103	104	105	106	107	108						
Planning, Concept Art & Storyboard	Possible Points													
	100													
Presentation, Summary & Analysis	100													
Game Play/Effective Simulation & UI	200													
Visual Design, 2D & 3D Assets & Audio	200													
Technical Skills & Code Development	150													
Performance & Optimization	150													
Written Test	100													
Résumé Penalty	0 or -10 only													
Clothing Penalty	Up to -50													
Total Possible Points	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0

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SkillsUSA National Championships

Interactive Application and Video Game Creation

2017

Professional Competencies

The technical committee has identified the following professional competencies addressed in the contest:

VG 1.0 — Solve a problem or create a conceptual design in a visual format

- 1.1 Conceptualization, visual communications for artists, and storyboarding techniques
 - 1.1.1 Solve problems and/or develop stories creatively
 - 1.1.2 Define how a problem will be solved or how a story will be told
 - 1.1.2 Describe the concept with enough depth to substantially and accurately communicate the final output for team members and interested third parties

VG 2.0 — Create and manipulate 2D, 3D, and audio computer-generated objects (assets).

- 2.1 Create assets using various technologies
 - 2.1.1 Create and modify 2D artwork, including textures, sprites, and backgrounds
 - 2.1.2 Create and modify 3D geometry to produce characters, objects, and environmental elements (models) that possess shape and texture
 - 2.1.3 Create and modify audio elements
 - 2.1.3 Optimize all assets for use in real-time, interactive environments
 - 2.1.4 Use programming to apply physics and other properties to assets for creating complex behaviors and relationships

VG 3.0 — Develop, Optimize, and Deploy Complex Interactive Multimedia Applications

- 3.1 Position assets, lights, and cameras and organize environments into scenes/levels, and output as a functional, interactive multimedia application or video game
 - 3.1.1 Apply logical properties to lights, cameras, and other assets so they appear and behave properly
 - 3.1.2 Add sounds, particles and/or visual effects to enhance the quality of the user experience
 - 3.1.3 Create a functional user interface
 - 3.1.5 Test, optimize, and deploy as an application or video game

VG 4.0 — Demonstrate the ability to work in a team environment

- 4.1 Cooperate with others to achieve the solution to a problem or bring a project from concept through development
 - 4.1.1 Demonstrate consensus building
 - 4.1.2 Apply written- and visual- communication skills to convey ideas between team members and interested third parties
 - 4.1.1 Divide tasks, set goals, and meet deadlines to complete complex projects with multiple contributors

VG 5.0 — Demonstrate proficiency in technical, small-group communications

- 5.1 Show the judges that your submission evokes the intended response from the audience by using technical presentation skills and other communication techniques
 - 5.1.1 Demonstrate in a manner appropriate to the audience
 - 5.1.2 Capture and retain the audience's attention and interest
 - 5.1.3 Elicit intended aesthetic responses to visual, auditory, and kinesthetic stimuli
 - 5.1.4 Achieve learning, familiarization, persuasion, or other intended objectives

Judging Rubric

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Presentation, Summary & Analysis	100
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SkillsUSA National Championships
Interactive Application and
Video Game Creation 2017

Written Examination

Overview: There are 100 possible points in this examination, which will count for ten percent (10%) of the overall score for the Interactive Application and Video Game Creation competition.

Teamwork: You and your teammates may work on the exam together. This is competitive, so take care not to expose your answers to other teams. Also note, it is a “closed book” examination.

Instructions: Please read the questions carefully. For true/false and multiple-choice questions, only answers that are *most specific and most correct* will be credited.

A maximum of forty-five minutes will be allowed to complete and turn in your answers.

Scoring: Scoring shall be as follows:

- Each of the twenty-five true/false and multiple-choice questions are worth four points.

Good Luck!

Michael Edmonds
Technical Committee Chair
Interactive Apps & Video Games

Team Number: _____

1. “Skin” is a 3D character’s exterior mesh that accepts UVW maps and textures. (T/F)
TRUE / FALSE
2. Physically-based rendering (PBR) is superior to Global Illumination because it takes into account micro-surfaces as well as indirect, reflective lighting. (T/F)
TRUE / FALSE
3. Optimization on the target platform to maximize frame rates include the following.
 - A. Optimizing CPU Usage
 - B. Optimizing Draw Calls to the GPU
 - C. Optimizing storage and memory requirement
 - D. All of the above
4. Which of these design elements affect “flow” in gameplay?
 - A. Pathways
 - B. Choke points
 - C. Spawn points
 - D. All of the above
5. The point where edges meet in a 3D mesh are called ...
 - A. Bodies
 - B. Edges
 - C. Vertices
 - D. Polygons
6. Perspective views use vanishing points at the zenith and/or horizon. (T/F)
TRUE / FALSE
7. MPEG is an example of a lossless video codec. (T/F)
TRUE / FALSE
8. Over 16 million different colors can be stored in 24 bits of data. (T/F)
TRUE / FALSE
9. Z-Fighting is the flickering that occurs in real-time rendering when two polygons exist in the same space and alternate providing color for the screen pixels. (T/F)
TRUE / FALSE
10. Including multiple images in a decal sheet increases the number of draw calls. (T/F)
TRUE / FALSE

11. Which of the following can be used to improve run-time performance?
- A. LOD Substitution
 - B. Backface Culling
 - C. Occlusion Culling
 - D. All of the above
12. FMOD is a sound effects engine for video game development. (T/F)
- TRUE / FALSE
13. Ray traced shadows are more accurate and render faster than shadow maps. (T/F)
- TRUE / FALSE
14. Which type of light would be best to simulate a florescent light fixture?
- A. Spot
 - B. Point/Omni
 - C. Area
 - D. Directional
15. Which elements are used to construct character rigs?
- A. Bones
 - B. Skins
 - C. Both A. and B.
 - D. Neither A. nor B.
16. Surface normal are not relevant for one-side polygons. (T/F)
- TRUE / FALSE
17. In computer modeling, turning Grid on does not necessarily cause objects to snap to a grid. A separate step is usually required to enable snapping. (T/F)
- TRUE / FALSE
18. Inverse Kinematics (IK) is a process that uses which of these principle(s)?
- A. Hierarchical linking from “child” objects back to their “parent” objects.
 - B. Placement of animation keys to define the forward movement of an object.
 - C. The sum of transforms in a chain of linked objects flowing to the end-effector.
 - D. All of the above.
19. The specular color of an object is measured at its brightest reflection point. (T/F)
- TRUE / FALSE
20. Session based, persistent and asynchronous are examples of:
- A. Physics Engines
 - B. Multiplayer Games
 - C. Game Engines
 - D. Game Objects

21. Physics systems can be used to simulate which of these 2D and 3D special effects?
(Check all that apply, no partial credit...)
- A. Collisions
 - B. Gravity
 - C. Atmospherics
 - D. Dynamics
22. Flocking is a technique to:
- A. Retarget animations
 - B. Group procedural particles
 - C. Simulate Crowds
 - D. Grunge textures
23. Artificial intelligence and machine learning (AI/ML) can be used for...
- A. Advanced game mechanics
 - B. Game analytics
 - C. Marketing and merchandising
 - D. All the above.
24. A first person camera always shows the player's viewpoint in perspective. (T/F)
TRUE / FALSE
25. Nested prefabs allows prefabs or slices of a game to be included in larger prefabs.
(T/F)
TRUE / FALSE