Project 3 Theme Park

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ID \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| Criterion | Target | Score | Comment |
| Upload   * Source code * Executable file * User manual * Tech document * 1.5~3minute introduction videos |  |  | If you did not finish this, you cannot get any score. |

* Check Point #1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (10)
* Check Point #2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (5)
* Final Demo score: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (238)
* Total: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Total = (Check Point #1 + Check Point #2 + Final Demo)
* The maximum number of points is 110.

Theme Park Final Demo (12/20)

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| **Train-related techniques** | | | |
| Criterion | Target | Score | Comment |
| Real Train Wheels | 1 |  |  |
| Simple Physics | 2 |  |  |
| Adaptive subdivision   * The level of detail in the subdivision is determined by the curvature of the curve. (2) * The level of detail in the subdivision is determined by the viewing distance. (2) | 4 |  |  |
| Improve the user interface of the frame work | 1 |  |  |
| Multiple tracks and trains   * The railroad tracks have junctions and switches, allowing you to choose the direction. (1) * Trains won't collide with each other. (1) | 2 |  |  |
| Approximating C2 curve | 2 |  |  |
| Sketch-based interface (1 ~ 5) | 5 |  |  |
| Have People on your Roller Coaster | 1 |  |  |
| Headlight | 1 |  |  |
| Smoke | 3 |  |  |
| Non-flat terrain   * Non-flat terrain * Altering the terrain with a brush (1) * Trains and rails do not penetrate the terrain (1) * When the slope becomes too steep, trestles are used for connection. (1) | 3 |  |  |
| Support Structure | 1 |  |  |
| Tunnels | 1 |  |  |
| Load obj model. (At least three models.) | 3 |  |  |
| Make totally over-the-top tracks   * Different kinds of cars. (1) * Multiple carriages. (1) * 3D rails (Instancing) (1) | 3 |  |  |

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| **Water surface-related techniques** | | | |
| Criterion | Target | Score | Comment |
| Wave equation (5) \_\_\_\_\_\_ | 5 |  |  |
| * Multi-passed scenic * Refraction (5) \_\_\_\_\_\_ * Reflection (5) \_\_\_\_\_\_ | 10 |  |  |
| Interactive Water Surfaces | 3 |  |  |
| Hack caustics effect | 3 |  |  |
| Photorealistic simulated caustics effect | 5 |  |  |
| Buoyancy and Floating Objects | 3 |  |  |
| Foam and Spray(1 ~ 5) | 5 |  |  |
| Dynamic Tessellation | 3 |  |  |

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| **Rendering techniques** | | | |
| Criterion | Target | Score | Comment |
| Texture mapping (3) 標靶、鑽頭 | 3 |  |  |
| Performance Tricks   * Level of Detail (3) \_\_\_\_ * Trick 1(1 ~ 5) \_\_\_\_使用CPU計算normal matrix * Trick 2(1 ~ 5) \_\_\_\_ 使用GPU計算模型的世界空間 * Trick 3(1 ~ 5) \_\_\_\_ | 15 |  |  |
| Shadow Mapping   * Directional light and Spot light (2.5) \_\_\_\_ * Point light (2.5) \_\_\_\_ | 5 |  |  |
| Really cool shaders   * Shader 1(1 ~ 5) \_\_\_\_子彈時間後處理 * Shader 2(1 ~ 5) \_\_\_\_子彈時間標靶雷達效果 * Shader 3(1 ~ 5) \_\_\_\_鑽頭的黑色線條 * Shader 4(1 ~ 5) \_\_\_\_自跟隨速度線背景 | 15 |  | Grayscale(1)  Edge Detection(1)  Bump Mapping(3)  Anti-aliasing(3) |
| Hack rendering and performance tricks   * Local lights (1) \_\_\_\_\_\_ * Inter-object reflections (3) \_\_\_\_\_\_ * Trick 1(1 ~ 5) \_\_\_\_ 使用投射於地上的影子 * Trick 2(1 ~ 5)\_\_\_\_ 降低飽和度使用灰階值與原本顏色的混合，而非精確的算法 * Trick 3(1 ~ 5)\_\_\_\_ specular使用近似算法 | 15 |  |  |
| Non-photorealistic rendering   * NPR 1(1 ~ 5) \_\_\_\_ *IMPACT FRAME* * NPR 2(1 ~ 5) \_\_\_\_ * NPR 3(1 ~ 5) \_\_\_\_ | 15 |  | Toon shading(1)  Pencil drawing(1~5) |
| Very Advanced Texturing   * Skybox (3) 有欸 * Billboard Object (3) \_\_\_\_\_ * Projector Textures (5) \_\_\_\_\_ * Environment Map (3) \_\_\_\_\_ * Texturing 1(1 ~ 5) \_\_\_\_\_\_\_ 地形的高度圖與標靶的深度圖 * Texturing 2(1 ~ 5) \_\_\_\_\_\_\_ 水的高度/法向量貼圖 | 15 |  |  |

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| **Modeling techniques** | | | |
| Criterion | Target | Score | Comment |
| Hierarchical Animated Model (1 ~ 5) \_\_\_\_\_\_\_ | 5 |  |  |
| Parametric Instancing (1 ~ 5) \_\_\_\_\_\_\_ | 5 |  |  |
| Sweep Objects (1 ~ 5) \_\_\_\_\_\_\_ | 5 |  |  |
| Subdivision (1 ~ 5) \_\_\_\_\_\_\_   * Sphere Subdivision (2) \_\_\_\_\_\_\_ | 5 |  |  |
| Other Modeling Methods   * Complex Procedural Model (3) \_\_\_\_\_\_\_ * Fractals (3) \_\_\_\_\_\_ * L-Systems (3) * Techniques 1(1 ~ 5) \_\_\_\_\_\_ * Techniques 2(1 ~ 5) \_\_\_\_\_\_ * Techniques 3(1 ~ 5) \_\_\_\_\_\_ | 15 |  |  |

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| **Animation Techniques** | | | |
| Criterion | Target | Score | Comment |
| Animation Techniques   * + - Particle system 有       * Technique 1 (2) \_\_\_\_\_\_\_ 簡單物理模擬       * Technique 2 (1) \_\_\_\_\_\_\_ 漸變色       * Technique 3 (1) \_\_\_\_\_\_\_ 橢圓形粒子     - Fake Physics Effects (1)     - Very Complex Behaviors (1)     - Complicated Animations (1)     - Techniques 1(1 ~ 2) \_\_\_\_\_ 運鏡     - Techniques 2(1 ~ 2) \_\_\_\_\_ 關鍵幀與插值 | 10 |  |  |

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| **Other items** | | | |
| Criterion | Target | Score | Comment |
| Something cools   * Cool point 1(1 ~ 5) \_\_\_\_\_\_\_ 超大鑽頭 * Cool point 2(1 ~ 5) \_\_\_\_\_\_\_ 超自由相機視角 * Cool point 3(1 ~ 5) \_\_\_\_\_\_\_ 超酷FUMO天元突破鑽頭飛天砲彈坦克車 * Cool point 4(1 ~ 5) \_\_\_\_\_\_\_ 超可愛gamma5.0和超可怕gamma 0.1 | 15 |  |  |
| Artistic Points   * Artistic point 1(1 ~ 5) \_\_\_\_\_\_\_ 超大鑽頭(和旋轉的黑線)(和速度線) * Artistic point 2(1 ~ 5) \_\_\_\_\_\_\_ RGB電競噴泉和阿姆斯特朗石碑 * Artistic point 3(1 ~ 5) \_\_\_\_\_\_\_ 和FUMO對坐，感受心靈的祥和與圖學的美妙 * Artistic point 4(1 ~ 5) \_\_\_\_\_\_\_ 世外桃源風格，配合skybox的特調水面顏色 | 15 |  |  |
| Make it a game (1 ~ 10) \_\_\_\_\_\_\_ 用火箭炮打標靶 | 10 |  |  |