CWSF 2019 - Fredericton, New Brunswick

Ethan Breit

Performant GPU Pathtracing

Challenge: Innovation
Category: Intermediate
Region: Toronto
City: Toronto, ON
School: Western Technical-Commercial School

Abstract: This project tests the effectiveness of prioritizing performance over fidelity in the development of a unidirectional pathtracer. The hypothesis is that a focus on parallel GPU computing and a novel implementation of algorithms can reduce render times without significantly impacting image quality. This approach could greatly improve draft iteration speed on large photorealistic computer graphics projects. The created pathtracer outperformed commercial pathtracers tested.

Biography

Ethan Breit is a Grade 10 student at Western Technical Commercial School in Toronto. From a very young age, Ethan had an interest in computers and computer graphics. In Grade 4, he started making text adventures in Java. Later, he moved to pixel graphics, and then eventually in Grade 8, hardware accelerated 3D graphics. Currently, he is working on his third hobby game engine featuring a level editor, physics, audio, and 3D graphics. He volunteered last summer at the Toronto District School Board, helping the Web App Development team. At the beginning of Grade 10, he took an interest in raytracing and more complex computer graphics. For his science project, he created a basic pathtracer that was roughly 50x faster than commercial renderers for simple scenes (however this speed, unfortunately, did not scale to more complex scenes). He decided to improve upon it (focusing on efficiency for complex scenes) and try his luck in the Toronto Science Fair where his project "Performant GPU Pathtracing" was selected to go to the CWSF. Ethan's current goal is to get into the University of Toronto for undergraduate work and then, ideally, ETH Zurich for a master's degree in computer graphics.

Awards	Value
Excellence Award - Intermediate - Bronze Medal Sponsor: Youth Science Canada	
Western University Scholarship Bronze Medallist - $1000 Entrance Scholarship Sponsor: Western University	$1 000
Total	$1 000