Darryl Gouder

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Experience

Computer Graphics Group at Charles University, Prague. · PRAGUE, CZECH REPUBLIC
Scientist · *September 2022 – Present*

Currently conducting research, looking to improve importance sampling for subsurface scattering. The research will be part of my doctoral dissertation. I am supervised by Prof. Alexander Wilkie, at CGG. Dr. Jiri Vorba (from Wētā FX) is a consulting advisor on the project. The project is fully funded by Wētā FX.

Wētā FX · PRAGUE, CZECH REPUBLIC
Rendering Researcher (part-time) · *December 2023 – Present*

Currently focusing on getting my research into production in manuka.

Unity PRAGUE, CZECH REPUBLIC
Rendering Researcher (part-time) · *September 2022 – December 2023*

I moved to Unity as part of the Wētā Digital acquisition. I stayed part of the Gazebo team, conducting research in real-time ray tracing. Our objective is to leverage hardware ray tracing to lift our image quality whilst handling VFX-level workloads in a real-time or responsive manner.

Wētā Digital · WELLINGTON, NEW ZEALAND
Rendering Researcher · *January 2020 – September 2022*

I worked on Wētā's real-time renderer, Gazebo, which is used as the primary viewport renderer. My role mainly involved developing new features, specifically a UDIM-based texturing workflow, and a Virtual Texturing system. I also maintained the Gazebo RT, a GPU Path Tracer. I additionally provided support and was expected to liaise with artists regarding bugs and feature requests.

Moving Picture Company · LONDON, UK
Rendering Software Developer · *October 2018 – December 2019*

I was part of the Genesis team. I was investigating the use of Microsoft's DXR API, combined with Unity. The objective was to combine rasterization and ray-tracing techniques for real-time previews, during virtual production, using Unity, DXR and Unity's HDRP. This work was presented at GTC 2019. I am currently investigating hair and fur shading models, for their use in real-time rendering.

Software Developer · *August 2017 – October 2018*

I was part of the New Technology team as a researcher and software developer, where my role was to keep updated on current research trends and develop software and tools for our pipeline. The role also required facetime with artists and external clients who provided us with new technology to experiment and prototype with such as PRMan 21/22, Fabric Engine, Maya and NUKE. The main languages used were C++ and Python. I was also the co-author of a pending patent application related to colour grading.

Nordiska Group. · NAXXAR, MALTA
Software Developer · *March 2017 – August 2017*

I was employed as a Software Developer to assist with the development and maintenance of the CRM system. Development was done in Python.

dormouse Ltd. · NAXXAR, MALTA
Research/Trading Assistant · *March 2016 – August 2016*

I was developing an in-house fund account management system whilst also assisting with the R&D of mathematical models used to compute trading decisions and also other applications which facilitate trading and monitoring. All development was carried out in Python 3.5.

Transactium Ltd. · ZEBBUG, MALTA
Student Software Developer · *June 2014 – August 2014*

Web development using web technologies and C#.

Bank of Valletta · ST. VENERA, MALTA
Student Software Developer · *June 2013 – August 2013*

Web development using web technologies and Java.

Student Software Developer · *July 2012 – December 2012*

Web development using web technologies and Java.

Education

University of Warwick
<div style="text-align: right">Coventry, England</div>

Master of Science in Scientific Computing
<div style="text-align: right"><i>October 2014 – September 2015</i></div>

Focused on the more of the scientific aspects of computation, such as High Performance Computing, Practical Data Structures and Algorithms, Agent-Based Systems, Monte Carlo Methods, Data Mining, and Computer Graphics. I obtained a Merit for the course and an A in my final dissertation.

University of Malta
<div style="text-align: right">Msida, Malta</div>

Bachelor of Science in Computer Science and Artificial Intelligence
<div style="text-align: right"><i>October 2011 - June 2014</i></div>

Covered different aspects of Computer Science such as During my 3-year degree I was also part of a team that took part in the Microsoft Imagine Cup. We won the national finals and represented Malta in St. Petersburg, Russia, at the international finals, albeit unsuccessfully. I was also the Student Representative for the Faculty of ICT between March 2012 and March 2013.

Publications

A Data-Driven Approach to Dwivedi Guiding

Computer Graphics Forum
<div style="text-align: right"><i>June 2025</i></div>

Presented at EGSR 2025, this paper explored accelerating volume path tracing by combining analytical Dwivedi Guiding with surface path guiding data to guide volumetric paths to exit in the illuminated regions of the boundary. The other co-authors were Jirka Vorba, Marc Droske, and Alexander Wilkie.

Sculpting Colour Spaces

SIGGRAPH Talk
<div style="text-align: right"><i>August 2019</i></div>

This project investigated the use of mesh manipulation tools for performing colour grading by modifying the colour space when it is represented in 3D space. I was the one who started it and provided the first few prototypes in Fabric Engine, before I had a shift in responsibilities, and Yanli Zhao took over and got it over the finish line. Rob PiekĂĺ was our lead, supporting us throughout the project.

Projects

Valinor

Physically Based Renderer
<div style="text-align: right"><i>March 2024 – Present</i></div>

A Vulkan renderer used for learning real-time ray tracing techniques and light transport on the GPU.

High Performance Physically Based Rendering for Virtual Light Fields

M.Sc. Dissertation
<div style="text-align: right"><i>June 2015 – September 2015</i></div>

I worked on parallelising a Physically Based Renderer using distributed computing, to generate a set of spherical images for virtual light field rendering. The Virtual Light Field was created to view the environment using stereoscopic displays at interactive frame rates, using a variety of interpolation techniques. The renderer was coded in C++ and parallelised using OpenMPI and the viewer was developed for use with the Oculus Rift using Unity 3D and Direct Compute shaders. I was supervised by **Dr. Kurt Debattista** and **Dr. Thomas Bashford-Rogers**.

A Final Gathering Technique for Rasterisation

B.Sc. Dissertation
<div style="text-align: right"><i>October 2013 – May 2014</i></div>

Researched and proposed a novel rendering technique called *Instant Irradiance Cache*, which used a cached set of pre-computed points to pre-calculate diffuse interreflections using Virtual Point Lights. We also proposed an acceleration structure which was used only by the VPLs to increase the speed of the calculation of the diffuse interreflections. I was supervised by **Dr. Keith Bugeja** and **Dr. Sandro Spina**.

Skills

Technical expertise:

Proficient in: C++, C, Python, OpenGL, Vulkan

Some experience with: CUDA, DirectX, OpenGL, R, OptiX, embree, PRMan

Tools used: git, LaTeX, Visual Studio, Unity3D, Intel VTune.

Natural languages:

English *(mother tongue)*, Maltese *(mother tongue)*.

Licenses:
Category B Driving Licence

Interests

Non-exhaustive and in no particular order: trail running, competitive swimming, rock climbing, football, mathematics, fantasy novels, gaming and computer graphics.