CARLOS LOPEZ GARCES

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Portfolio and blog: www.clopezgarces.com · Code repository: github.com/carlos-lopez-garces

EDUCATION

University of Pennsylvania 2023 - 2025

M.S. Computer Graphics and Game Technology (CGGT) *Philadelphia, Pennsylvania, USA*

Indiana University 2020 - 2023

B.S. Mathematics *Richmond, Indiana, USA*

Selected coursework: Linear Algebra, Probability, Mathematical Statistics, Topology, Real Analysis.

Tecnológico de Monterrey 2006 - 2010

B.S. Computer Science *Guadalajara, Jalisco, Mexico*

With a specialization in Computer Graphics and AI.

SELECTED PERSONAL PROJECTS

clopezgarces.com/projects/cpbrt My implementation of the renderer of the book *Physically Based Rendering: From Theory to Implementation* by Pharr, Jakob, and Humphreys.

clopezgarces.com/projects/cdxr A DirectX 12 real-time hybrid rasterization-raytracing renderer.

clopezgarces.com/projects/cdx A DirectX 12 renderer featuring a few real-time rendering techniques.

EMPLOYMENT

HOVER Inc. (hover.to) 2019 – 2023

Real-time rendering and interactive 3D modeling of homes. *San Francisco, California, USA*

Senior 3D Graphics Engineer

· Implemented global illumination algorithms, normal and roughness mapping, a linear workflow for color management, procedural generation of terrain, procedural generation of geometry for enhancing the base polygon mesh of the HOVER house model.
· Implemented detection algorithms for types of roofs over the polygon mesh of the HOVER house model.
· Contributed to HOVER's real-time path tracer on the web.

Apcera, now a subsidiary of Ericsson (apcera.com) 2016 – 2018

A container runtime and orchestrator for the cloud. *San Francisco, California, USA*

Senior Software Engineer

· Implemented rolling update and restart of replicas.
· Implemented autoscaling of replicas using a proportional-integral-derivative controller.
· Participated in the reimplementation of the container runtime for compliance with the Open Container Initiative industry standard.

Oracle Corporation (oracle.com) 2011 – 2016

RDBMS database kernel. *Guadalajara, Jalisco, Mexico*

Senior Member of Technical Staff

· Worked across the Virtual OS, a part of the RDBMS's kernel: memory allocation, background process management, synchronization primitives, and threading.
· Responsible for maintaining and optimizing the Shared Server architecture and the kernel's diagnostic system.
· Participated in porting Oracle 12c from Linux x64 to HPUX IA64 and AIX PowerPC-64. In particular, the startup and shutdown services of the RDBMS server and the Oracle Java Virtual Machine.

SKILLS

C (5+ years professionally)
C++ (5 years, side projects)
Go programming language (3 years professionally)
Linux systems programming (5+ years professionally)
DirectX12/HLSL (3+ years, side projects)
WebGL/GLSL (4+ years professionally)
Vulkan (1 year, side projects)
3D Math

INTERNSHIPS

Google Summer of Code (GSoC) 2010 May - August 2010

A student program sponsored by Google for contributing to open-source software.

· Better Print Support project: Scalable maps for mapnik.org. [Archive record]

RESEARCH EXPERIENCE

Indiana University, Undergraduate Student Researcher 2022
Research paper: *Derivation and Evaluation of Monte Carlo Estimators of the Scattering Equation Using the Ward BRDF and Different Sample Allocation Strategies*
Advised by Dr. Nayeong Kong, Assistant Professor of Mathematics.
Submitted for publication in the Journal of Student Research at IU East (JSRIUE). Acceptance pending.

TALKS

28th Indiana University Undergraduate Research Conference (IUURC) December 2022
Derivation and Evaluation of Monte Carlo Estimators of the Scattering Equation Using the Ward BRDF and Different Sample Allocation Strategies *IUPUI Campus*

HONORS AND AWARDS

Honors and Excellence Distinction for B.S. Computer Science 2010
A distinction given by Tecnológico de Monterrey to students that graduate with GPA higher than 95 / 100. Ranked 1st of class 2010.

Academic Merit Award 2009
Awarded by the Student Affairs Division and Alumni Association of Tecnológico de Monterrey for obtaining the highest GPA (98.83 / 100) of all undergraduate engineering, architecture, and health sciences students in the whole year 2009.

CERTIFICATIONS

Georgia Tech on edX 2021
Linear Algebra IV: Orthogonality & Symmetric Matrices and the SVD [Certificate]

DeepLearning.AI on Coursera 2017 - 2018
Neural Networks and Deep Learning [Certificate]
Improving Deep Neural Networks: Hyperparameter Tuning, Regularization [Certificate]
Structuring Machine Learning Projects [Certificate]

Ardan Labs 2017
Ultimate Go (programming language) [Course]

The Linux Foundation 2014
Developing Applications for Linux (LFD401) [Course]