PEDRO FIGUEIREDO

400 Bizzell St, College Station, TX | +1 979-288-1930 | pedrofigueiredo@tamu.edu | people.tamu.edu/~pedrofigueiredo

EDUCATION

Texas A&M University, United States of America — **January 2020 - Present**
Doctor of Philosophy in Computer Science

Eötvös Loránd University, Hungary — **January 2018 - December 2019**
Bachelor of Science in Computer Science

Universidade Federal da Paraíba*, Brazil — **February 2015 - December 2017**
Bachelor of Science in Computer Engineering
*Transferred to Eötvös Loránd University

PUBLICATIONS

Neural Importance Sampling of Many Lights — **In submission, PhD**
Texas A&M University, United States of America — *Nima Kalantari, PhD*
- Estimates spatially varying light selection distributions to improve importance sampling in Monte Carlo rendering.
- To efficiently manage hundreds or thousands of lights, we integrate our neural approach with light hierarchy techniques using a residual learning strategy.

Neural Path Guiding with Distribution Factorization — **In submission, PhD**
Texas A&M University, United States of America — *Nima Kalantari, PhD*
- Introduces a fast and expressive neural path guiding method that breaks down the 2D distribution over the directional domain into two 1D probability distribution functions (PDF) modeled by TinyCUDA networks.
- Reduces variance of the gradient during optimization by caching the incoming radiance with an additional network.

Frame Interpolation for Dynamic Scenes with Implicit Flow Encoding — **PhD**
Texas A&M University, United States of America — *Nima Kalantari, PhD*
- Interpolates between a pair of images of a dynamic scene featuring brightness and illumination changes.
- Encodes pre-trained bidirectional flows into a coordinate-based network, powered by a hypernetwork, to obtain a continuous representation of the flow across time. Significantly outperforms SOTA frame interpolation algorithms.

RESEARCH

Real-Time Affine Transformations of 3D Meshes — **BSc**
Eötvös Loránd University, Hungary — *Csaba Bálint, MSc*
- Created OpenGL application using octrees to leverage SDFs as a way of performing fast affine transformations in 3D meshes.

Physically-Based Rendering for Motivating Undergraduate Students — **BSc**
Universidade Federal da Paraíba, Brazil — *Christian Pagot, PhD*
- Developed CPU Pathtracer application in C++ for motivating computer engineering undergraduate students.

EXPERIENCE

Research Intern — **May 2023 - August 2023**
NVIDIA, United States of America
- Researched rendering-focused frame interpolation algorithms applied to NVIDIA's commercial frame interpolation solution (DLSS).
- Engineered efficiency improvements to current DLSS software. Proposed larger-scale architecture shifts for future iterations.

Machine Learning Intern — **May 2021 - August 2021**
Ericsson, United States of America
- Designed and developed hardware resource forecaster for network infrastructure. Containerized solution uses statistical and deep-learning methods trained on existing logged usage data. Allows on-demand probability forecast suiting diverse use-cases.
- Lead the development of smart search engine for network defects. Containerized API and interface allows engineers to quickly find previously logged solutions of similar defects across Ericsson global. Uses combination of existing search algorithms and trained NLP models for enhanced suggestions. Validated and approved by network engineers.

Software Developer Intern — **May 2018 - December 2019**
Ericsson, Hungary
- Developed prototypes for Ericsson's edge computing platform leveraging quick 20ms response times from 5G hardware.
- Engineered and deployed 5G IoT applications for cloud computing hosted on AWS and Microsoft Azure.

C++ Developer Intern — **January 2016 - December 2017**
LAVID/UFPB, Brazil
- Developed software for image and video processing focused on data structure refactoring and algorithm optimization. Work resulted in 200% faster, more efficient modules and overall better user experience validated with user studies.
- Implemented application that leveraged object recognition via CNNs and text-to-speech tools for the visually impaired.
- Worked on main open-source project in Brazil for sign language translation, VLIBRAS.