Marcus Loo Vergara

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SUMMARY OF QUALIFICATIONS

M.Sc. in Computer Science. Graduated from the Norwegian University of Science and Technology June 2019. Specialized in computer graphics and real-time computational systems, with an additional interest in deep learning. Self-motivated, quick learner, and enjoy collaborating with others.

- C, C++ & Rust
- Vulkan, DX11 & OpenGL
- GPGPU
- Python
- API Design
- Deep Learning
- Windows & Linux
- Frontend, Qt, UI
- Network Programming

EDUCATION

Norwegian University of Science and Technology, Trondheim, Norway — Aug 2013 – Jun 2019
Master of Science in Computer Science
- Specializing in computer graphics, computer vision, and deep learning

University of California, San Diego, San Diego, USA — Oct 2017 – Jun 2018
Additional Studies, Computer Science
- Studying at UC San Diego as part of my degree

WORKING EXPERIENCE

Senior Software Developer at myVR/Hexagon, Oslo, Norway — Aug 2024 – Present
Software Developer — Nov 2022 – Aug 2024
Full-time R&D position focusing on rendering of parametrically defined geometry in addition to optimizing API-level rendering code for mobile, desktop and web platforms
- Extending the internal multiplatform rendering API with modern features
  - Compute shaders, storage buffers, uniform buffers, etc.
  - Must support DirectX11, DirectX12, Vulkan, OpenGL, WebGL, WebGPU, Metal
- Optimized rendering of parametric geometry showing improvements up to 30% on some devices
- Adding functionality to convert and visualize CAD files

Drone Software Engineer at Nordic Unmanned, Oslo, Norway — Feb 2021 – Nov 2022
Full-time position developing custom software solutions for maintenance and delivery drones
- Writing drivers to read IMU data from the on-board sensors
- Improving and extending in-house simulator capabilities
- Implementing video streaming, focusing on stability over low-bandwidth links
- Integrating and testing third-party hardware and microcontrollers

Junior Graphics Programmer at Funcom, Oslo, Norway — Oct 2019 – Feb 2021
Full-time position as an Unreal Engine rendering programmer working on *Dune: Awakening*
- Researching modern rendering techniques and extending Unreal Engine's rendering capabilities
- Optimizing development workflows for artists and other users
- Fulfilling internal support and debugging of rendering issues

Graphics Software Engineering Intern at Sony Interactive Ent., San Mateo, USA — Jul 2018 – Sep 2018
Internship at SIEA's Global Developer Technology Group
- Implemented a physically-based shading model running on the PlayStation 4
- Investigated possibilities for implementing tools to extract and analyze GPU performance data

Software Developer at Grabster, Trondheim, Norway — Jul 2017 – Aug 2017
Summer job assisting a start-up with app development
- Grabster was a food-selling marketplace app for iOS and Android

- Implemented screen navigation and backend functionality for the Android app (*React Native*)

Teaching Assistant at the Norwegian University of Science and Technology Aug 2015 – May 2019
On-campus part-time job assisting students
- Support and advising in solving theoretical and practical questions
- Assigned subjects:
  - Jan 2019 – May 2019: Computer vision and deep learning
  - Jan 2016 – May 2017: Procedural and object-oriented programming (C++)
  - Aug 2015 – Dec 2015: Computers and digital design (Assembly programming)

RELEVANT PROJECTS

Game Engine Programming, Side-project 2011 – Present
Written a game engine from scratch and making a GPGPU heavy sandbox physics game using it
- Supported rendering APIs: Vulkan and DirectX11 (previously OpenGL 4.2)
- Threaded rendering and performance metrics
- Focused on programmer-centric workflows to simplify development
- See Twitter or Bluesky for more:
  - https://x.com/bitsaucedev
  - https://bsky.app/profile/bitsauce.bsky.social

Reinforcement Learning for Autonomous Vehicles, Thesis Sep 2018 – Jun 2019
Research in the field of deep reinforcement learning, implementing methods to teach a simulated car to drive inside the open-source driving simulator, *CARLA*
- Implemented a custom version of the *Proximal Policy Optimization* reinforcement learning method with *Python* and *TensorFlow*
- Created an *OpenAI gym*-like environment that works with CARLA – to make RL research in CARLA easier
- Substantially reduced training time through experimentation with reward functions, environment designs, and improvements to the PPO algorithm by scaling the output mean to respective limits
- Video of results: *https://youtu.be/iF502iJKTIY*

MISCELLANEOUS

Seismic Map Illustration for European Standard, Commissioned Work Apr 2021
Used official seismic data from EFEHR along with geographical boundaries of municipalities in Norway to programmatically create a seismic map, printed in the official standard: *NS-EN 1998-1:2004+A1:2013+NA:2021*.

Teaching Assistant Training, Norwegian University of Science and Technology May 2019 – May 2019
Certificate awarded for attending a pedagogical training course for teaching assistants

Abakus GameDev, Norwegian University of Science and Technology Aug 2014 – Jun 2019
Co-founder and leader of student organization *Abakus GameDev* – a student organization for people who enjoy making games, discussing their development, design, and the industry in general
- Responsible for creating a socket-based framework that was used for AI competitions
- Participates in meetings, discussing workshop ideas and advertising
- Held a presentation on deep reinforcement learning for games