

Marcus Loo Vergara

Oslo, Norway

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SUMMARY OF QUALIFICATIONS

M.Sc. in Computer Science. Graduated from the Norwegian University of Science and Technology June 2019. Specializing in computer graphics and computer vision via deep learning. Self-motivated, quick learner, and enjoy collaborating with others.

- C/C++
- Python
- TCP & UDP
- OptiX & CUDA
- Deep Learning
- Windows & Linux
- OpenGL & GLSL
- Keras, PyTorch & TensorFlow
- JavaScript, HTML & CSS

EDUCATION

Norwegian University of Science and Technology, Trondheim, Norway Aug 2013 – Jun 2019
Master of Science in Computer Science GPA: 3.1/5

- Specializing in computer graphics, computer vision, and deep learning

University of California, San Diego, San Diego, USA Oct 2017 – Jun 2018
Extracurricular studies, Computer Science GPA: 3.5/4

- Studying at UC San Diego as part of my degree

WORKING EXPERIENCE

Graphics Programmer at Funcom, Oslo, Norway Oct 2019 – Present
Full-time position as a Unreal Engine rendering programmer:

- Researching modern rendering techniques and extending Unreal Engine's rendering capabilities with e.g. DX12 bindless textures, texel density tools, decal importing tools, etc.
- Focused on making efficient UE workflows for artists and other users
- Fulfilling internal support and debugging of reported rendering issues

Graphics Engineering Intern at Sony Interactive Entertainment, San Mateo, USA Jul 2018 – Sep 2018
Internship at SIEA's Global Developer Technology Group

- Implemented a physically-based shading model running the PlayStation 4
- Investigated tools for automatically extracting and analyzing GPU performance data
- Exposure to low-level programming for specialized hardware

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
- Graded assignments
- 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

Reinforcement Learning for Autonomous Vehicles, Thesis Sep 2019 – Present

Used state-of-the-art deep reinforcement learning 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 decreased training time by scaling the output mean of each action's Gaussian distributions to the action's respective limits
- Video of results: <https://youtu.be/iF502iJKTIY>

Ray-traced Soft Shadows, CSE 274 Course project Mar 2018

Used NVIDIA's OptiX ray tracer to implement *Axis-Aligned Filtering for Interactive Sampled Soft Shadows*

- Provided a fundamental understanding of the use of frequency analysis in ray tracing
- Achieved *interactive* framerates of about 5-30 FPS on a NVIDIA GTX 970

Game Engine Programming, Side-project 2010 – Present

Writing a game engine from scratch in C++

- Ongoing side-project since 2010
- Uses OpenGL 4.2 and Simple DirectMedia Library to render to the screen
- Intended to serve as a mode of learning the inner-workings of game engines
- Developed alongside an infinite, procedurally-generated, sandbox game
 - See my homepage, bitsauce.github.io, for more information regarding these and other projects

MISCELLANEOUS

Teaching Assistant Training, Norwegian University of Science and Technology Feb 2019 – May 2019

Certificate of attending a 20-hour 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