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, with additional interest in deep learning-based methods. Self-motivated, quick learner, and enjoy collaborating with others.

- C/C++
- OptiX & CUDA
- OpenGL & GLSL

- Python
- Deep Learning
- Keras, PyTorch & TensorFlow

- TCP & UDP
- Windows & Linux
- 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
Additional 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