Marcus Loo Vergara

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SUMMARY OF QUALIFICATIONS

Senior student at the Norwegian University of Science and Technology working towards a master's degree in Computer Science. Specializing in computer graphics and computer vision, with a recent focus on deep learning. Expecting graduation June 2019. Self-motivated, quick learner, and enjoy helping others.

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

EDUCATION

University of California, San Diego, San Diego, USA — Oct 2017 – Jun 2018
Master of Science in Computer Science — GPA: 3.49
- Studied at UC San Diego for a year

Norwegian University of Science and Technology, Trondheim, Norway — Aug 2013 – Expected Jun 2019
Master of Science in Computer Science — GPA: 3.00
- Specializing in computer graphics, computer vision, and deep learning

WORKING EXPERIENCE

Graphics Software Engineering Intern, Sony PlayStation — Jul 2018 – Sep 2018
Internship at PlayStation's Developer Technology Group (DTG)
- Created a performance analysis tool to help DTG more quickly debug and suggest improvements to our customers regarding their GPU performance on the PlayStation 4™
- Implemented physically-based shading on the PlayStation 4™
- Exposure to low-level programming for specialized hardware
- Gained experience in teamwork and good coding practices
- Trained an autoencoder to generate metallic, roughness and ambient occlusion textures

Software Developer, Grabster — Jul 2017 – Aug 2017
Summer job assisting a start-up in app development
- Grabster is a sharing economy platform based on buying and selling food between individuals
- Implemented and tested screen navigation and backend functionality for the Android app
- Gained experience in using *React Native* and *Node.js*

Teaching Assistant, Norwegian University of Science and Technology — Aug 2015 – May 2017
On-campus part-time job assisting students
- Support and advising in solving theoretical and practical questions
- Graded assignments
- Assigned subjects:
  - Aug 2015 – Dec 2015: Computers and Digital Design (Assembly programming)
  - Jan 2016 – May 2017: Procedural and object-oriented programming (C++)

RELEVANT PROJECTS

Human Keypoint Detection, CSE 252C Course Project — Jun 2018
Created a Mask R-CNN based model to detect human keypoints in images of people
- Uses Mask R-CNN for instance-level bounding box and keypoint detections
- Trained with Keras and TensorFlow

Deep Learning on Point Cloud Data, CSE 291-I00 Course Project Apr 2018
Used the convolutional architectures PointNet and PointNet++ to segment stem and leaf points in 3D point scans of plants in various stages of growth and various environments
- Experimented with different data preprocessing to enable PointNet for big (1+ million) point clouds

OptiX Project, 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

Image Captioning, CSE 190-C00 Course Project Dec 2017
Used LSTMs to generate captions for input images
- CNN extracts features from image and recurrent LSTMs generate image captions

Recommender Systems, CSE 258 Course project Nov 2017
Used bag-of-word techniques to identify user preferences by their comment history
- Used linear regression, SVMs and latent factor models to make predictions on user preferences
- Participated in a Kaggle competition for the class – reached top 90%
- Used Reddit API to mine comments and post history through PRAW

Autonomous Vehicle Perception, TDT4265 Course Project May 2017
Trained a model based on Faster R-CNN recognize and locate cars in images
- Setting up a development environment in Ubuntu to train the deep network in *Caffe*

Game Engine Programming, Side-project 2010 – Present
Writing a game engine from scratch in C++ with OpenGL
- Ongoing side-project of 7 years
- Used the game engine to make a procedurally generated 2D game

CAMPUS ACTIVITIES

Abakus GameDev, Norwegian University of Science and Technology Aug 2014 – Present
Co-founder and leader of student organization *Abakus GameDev*: a student organization for people who enjoy making games and discussing various topics in game design
- Responsible for creating frameworks for AI competitions
- Participating in meetings, discussing workshop ideas, and advertising