Xindong Lin

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Research Interests: computer graphics, scene representation, motion capture, computer vision and deep learning

Education

The University of British Columbia 2017 – Present
BSc, Computer Science and Mathematics, final year GPA: 93.9/100 *Vancouver, BC*

Research Experience

Relative motion capture under clothing with electromagnetic and optical devices May 2022 — Present
Supervisor: *Dr. Dinesh K. Pai, Aiming at SIGGRAPH 2023*

- This project investigates the amalgam of electromagnetic and optical motion capture data, and aims to collect motion capture data under clothing to drive better simulations.
- Set up the electromagnetic motion capture system (Polhemus Viper 16) data collection pipeline in the Sensorimotor System Lab (SSL).
- Visualized and analyzed the data collected to improve the stability of the collection pipeline.
- Contributed to developing a least-square-fitted transformation matrix to calibrate the electromagnetic device Viper and the passive optical device Vicon.
- Contributed to testing the accuracy of Viper in an electromagnetic-benign environment using a well-calibrated optical device Vicon.

Local smoothness layer for implicit coordinate learning Jan 2022 – Present
Supervisor: *Dr. Helge Rhodin, Aiming at Transactions on Machine Learning Research (TMLR)*

- This project presented a novel implicit neural representation using coordinate learning.
- The Local Smoothness layer (LS-layer) learns the local Gaussian ellipsoids adaptively as feature anchors and exploits the local information between coordinates to produce faithful results in both the high and low-frequency data regions.
- Configured and ran baseline projects such as BACON, ACORN, SAPE, NeRF and SIREN on Compute Canada. Trained these baselines with new data and modified the code for a fair comparison to our model.
- Computed and analyzed metrics for both 2D and 3D tasks using self-crafted scripts.
- Contributed to the manuscript preparation.

Work Experience

Full Stack Developer Intern | *Vue.js, Spring Boot, Java, JavaScript* Sep, 2022 - Present
SAP, Partner Technology Team, Partner Finder *Vancouver, BC*

- Maintained and created frontend components using Vue.js.
- Developed unit tests and end-to-end (E2E) tests using Vue Test Utils and Chai.
- Maintained and developed elastic search related features on the backend side using Spring Boot.
- Created backend tests in JUnit, Mockito, and Hamcrest.
- Contributed to developing Postman collection to initiate traffics. Tested backend REST APIs using Postman.

Teaching Assistant | *THREE.js, JavaScript, WebGL, OpenGL* Sep 2021 — present
The University of British Columbia, Computer Graphics *Vancouver, BC*

- Created assignments and exam questions on shadow mapping, various shadings, textures, skybox and environment mapping in THREE.js and GLSL.
- Held office hours to assist students with course concepts and assignments.

Software Developer Intern | *Thymeleaf, HTML5, CSS3, Velocity, Java* May 2021 — Dec 2021
Global IQX, Quoting Engine *Ottawa, Ontario*

- Developed over 40 dynamic PDF and CSV quoting templates using the Thymeleaf and Velocity engine.
- Optimized Java Spring message files and reorganized the quote data structures in the quoting engine.

Software Test Engineer Intern | *Python, Linux, VPN, Selenium* Jan 2020 — Aug 2020
Sierra Wireless Inc., MG90 *Richmond, BC*

- Developed and maintained multithreading automation test scripts for the frontend portal on router MG90 using Selenium.
- Set up and maintained the Python automation testbed for the IPsec VPN, network traffics and GPS on MG90.
- Developed a TCP/UDP test tool based on server-clients architecture using Python Socket.

Course Projects

Ray Tracer | *C++* Nov 2020 – Dec 2020

- A simple ray tracing engine written in C++ that extended the Ray Tracer from Peter Shirley.
- This project renders 3D objects such as spheres, cubes and torus with various lighting and shadowing.

Insight Facade | *TypeScript, JavaScript, HTML5, REST, AJAX, Mocha, Chai, JSZip* Sep 2020 – Nov 2020

- A web query application that is used to explore the information about courses and rooms at UBC.
- The frontend is built from scratch with a query builder, indexer and sender to interact with the backend.
- The backend is built using the Restify API with GET, PUT, POST and DELETE requests.
- A scheduler was developed to accommodate classes into classrooms in the most time-saving manner.
- Tested with 100% code coverage using Mocha and Chai for both the backend and frontend.

Machine Learning Projects | *Python, scikit-learn* Sep 2020 – Dec 2020

- A tweets classifier that uses word2Vec data to classify if a tweet is made by Trump or Biden. Several models were built from scratch to compare the performance of classifying word data.
- A COVID-19 predictor that uses an auto-aggressive linear regression model to predict Canadian death cases.
- A MNIST classifier that classifies different handwritten digits from 0-9 using CNN.

Image Player | *C++* Jan 2019 – Apr 2019

- Image processing algorithms written in C++ that consist of 3 parts: Image reassemble, color flood and lossy compression.

Honours and Awards

Work Learn International Undergraduate Research (WLIUR) Awards May 2022
The University of British Columbia *Vancouver, BC*

- An award for outstanding students interested in research.

Reginald Palliser-Wilson Scholarship Sep 2021
The University of British Columbia *Vancouver, BC*

- An award for exceptional mathematics students recommended by the department.

Science Scholar/Dean's Honour List Sep 2020
The University of British Columbia *Vancouver, BC*

- Students with a standing of 90% or better in the previous Winter Session.

Dean's Honour List Sep 2018
The University of British Columbia *Vancouver, BC*

- Students with a standing of 85% or better in the previous Winter Session.

Vantage College Top 10 Students Award Jun 2018
The University of British Columbia *Vancouver, BC*

- Top 4 student of 2017 Vantage College graduated students.

Technical Skills

Languages: Python, TypeScript/JavaScript, C++, HTML, CSS, Java, GLSL, C, C#, SQL, LaTex
Libraries/Frameworks: PyTorch, Numpy, scikit-learn, THREE.js, Node.js, Vue.js, Tensorflow, Keras, REST, Selenium