Bob Wei

Email q25wei@edu.uwaterloo.ca
LinkedIn in/bobqywei
GitHub github.com/bobqywei
Website bobwei.ml

Skills & Qualifications

Python C/C++ Java Objective C Matlab Swift C#
PyTorch Unity3D Git GCP Compute UNIX Cuda

Work Experience

Software Developer Intern | *BlackBerry Messenger* — May 2018 – August 2018

- Improved and maintained a messaging platform that reaches nearly 2 million daily-active users, working as one of the primary **iOS** developers on both the Channels and Partners teams
- Accelerated BBM iOS performance through efficient **reactive programming** design (Reactive Cocoa) and through code refactoring on the architectural level: moving from **MVC** and **MVVM** to the more dynamic **Clean** architecture
- Modernized the user experience with the **complete redesign** of the client-facing Channels & Official Accounts features, from the core level to the view-controller level
- Introduced **picture-in-picture** support for YouTube playback in BBM conversations and chat bot messages

Projects

Image Inpainting Model | *Convolutional Neural Network* **GitHub**

- Developed and trained a model capable of filling in **irregular holes** in an image through a **single forward pass** (https://youtu.be/laq6mqo0r-E), making it fast and flexible enough for real world applications
- Constructed **PyTorch** model based on **U-Net** encoder-decoder architecture and the **partial convolutional** layers detailed in *Liu, G., Reda, F.A., Shih, K.J. (2018) "Image Inpainting for Irregular Holes Using Partial Convolutions"*
- Experimented with the use of ImageNet pre-trained **VGG**-based models (for feature extraction) in order to compute higher level **style loss** values, as well as with other loss functions used by *Liu et al., 2018*
- Leveraged **Google Cloud Compute** Cuda GPU's for training and fine-tuning the model
- Currently working on improvements such as compressing the weights for potential integration on mobile platforms and in-place batch-normalization for decreased GPU VRAM usage during training

Infinity Runner | *Mobile Game* **GitHub**

- An infinite 3D platformer game for both iOS and Android platforms (https://youtu.be/rk8PiT0Al7s), developed in **Unity3D** (C#) with the use of models created in **Blender**
- Designed the endless gameplay mechanics using built-in gradient randomization and **procedural generation**

Volunteer Work

Research Assistant | *Brock University* — June 2016 – June 2017

- Worked in the material physics lab with Dr. Thad Harroun and his team
- Increased precision of experiments involving energy propagation by **40%** through frequency optimization performed with **NumPy** fast fourier transforms
- Improved the efficiency of experiments by automating data collection through **PySerial** interface

Embedded Software Developer | *Waterloop* — October 2017 – April 2018

- Designed and implemented the data-transfer architecture for the **sensor systems** onboard the Hyperloop pod, specifically using CAN-BUS and I2C protocols
- Contributed to the redesign of the Hyperloop pod as part of Waterloop's new phase, documenting various **failure scenarios** for the embedded systems and the corresponding response

Education

Bachelor of Software Engineering | *University of Waterloo* — September 2017 – April 2022

Interests

Rowing (Crew) Basketball Weight Training Graphic Design Cool Hardware