Bob Wei

q25wei@edu.uwaterloo.ca
in/bobqywei
github.com/bobqywei
bobqywei.github.io/me

Skills & Technologies

Python C/C++ Golang Java Objective C Swift C# Scala SQL
Pytorch Tensorflow Unity3D OpenCV Postgres MongoDB Docker Unix Git

Work Experience

Uber Advanced Technologies Group (Toronto, ON) Research Intern — September 2019 – Present

- Experimenting with novel approaches in the fields of self-driving and general machine learning (details under NDA)
- Implementing deep learning based computer vision algorithms using **Pytorch** and **CUDA C**

Side Effects Software (Toronto, ON) 3D Software Developer Co-op — January 2019 – April 2019

Houdini 17.5 launch: sidefx.com/tutorials/machine-learning-data-preparation/

- Designed an interactive terrain generation algorithm to learn the mapping between 2D sketch and real-world height-field
- Completed a full-fledged prototype for a node-based approach to ML, dictating future deployment in SideFX products
- Developed and tuned machine learning models to apply simulated erosion and weathering to high-res terrains, achieving similar qualitative and quantitative results (>**95%** SSIM) nearly **50,000x** faster than the conventional methods in VFX
- Created an asynchronous, pipelined environment integrated into SideFX Houdini for hyper-parameter space search

BlackBerry Messenger (Mississauga, ON) Software Developer Intern — May 2018 – August 2018

- Refactored legacy MVC code to Clean architecture, using reactive programming principles in Objective C and Swift
- Redesigned user interface for BBM Channels and Official Accounts features on iOS

Research & Projects

UWFlow

uwflow.com (**1.0**)

- UWFlow is the primary website for course related info and reviews at Uwaterloo with over **25k** monthly users
- Working together with a small team to develop and deploy version 2.0, with completely revamped code base
- Building the new back-end infrastructure from the ground up with **Golang**, **Postgres**, and **Hasura** at the core
- Designed a new authentication server to support Facebook and Google Login over OpenID and Oauth 2.0 protocols

Image Inpainting Project

youtube.com/watch?v=laq6mqo0r-E

- Developed a Unet based generative model to perform image inpainting, filling in irregular holes in natural images
- PyTorch implementation of partial/masked convolutions based on published research from Nvidia
- Currently maintaining code base on GitHub, investigating issues and improvements such as weight compression

EquiSurf: Computer Vision Research

- Collaborated with graduate students from the University of Toronto
- Experimented with current state-of-the-art in single image super-resolution using deep ResNet and GAN based models, studying the effect of added depth information and the semantics of the super-resolution task itself

Infinity Runner 3D Platformer

youtube.com/watch?v=rk8PiT0AI7s

- Designed a Unity3D, platformer game for both iOS and Android platforms, utilizing procedurally generated level design
- Defined behavior of player and the terrain using C# scripts attached to Blender 3D assets

Education

Bachelor of Software Engineering | University of Waterloo (3.95 GPA) | Expected Graduation: April 2022