Bob Wei

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Skills & Technologies

Python C/C++ Java Objective C Swift C# Scala SQL
Pytorch Tensorflow Unity3D OpenCV Unix Postgres Xcode

Work Experience

3D Software Developer | *Side Effects Software* January 2019 – Current

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

- Designed an interactive terrain generation software, using a conditional GAN to model the mapping between 2D sketch and real-world height-field (extracted from satellite imagery of Rocky Mountains)
- 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

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

- Refactored legacy MVC code to Clean architecture, using reactive programming principles in Objective C and Swift
- UI overhaul redesign for BBM Channels and Official Accounts features

Research & Projects

EquiSurf: Computer Vision Research

- Currently working with graduate students on computer vision research
- Experimenting 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
- Interpolated sparse depth maps to more useful, high-density maps through nearest neighbors and barycentric coordinates
- Projected LIDAR depth maps to 3D point cloud representations to be visualized using mesh rendering

Image Inpainting Project

Demo: 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

UWFlow

Active site: uwflow.com

- UWFlow is the primary website for course related info and reviews at UWaterloo
- Working together with a small team of developers to maintain and overhaul the front-end and back-end
- Migration of Flask and MongoDB backend to lightweight Falcon and Postgres
- Currently fixing active issues on the Python backend, addressing the concerns of the public user base

Infinity Runner 3D Platformer

Demo: 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)*

Interests

Rowing (Crew) Basketball Weight Training Graphic Design Computer Hardware Product Design