Kefan (Arthur) Chen

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EDUCATION

University of Toronto Sep 2014 – May 2018

- Bachelor of Applied Science in Electrical Engineering
- Relevant coursework: Machine Learning (graduate), Computer Graphics (graduate), Artificial Intelligence, Computer Architecture (graduate), Operating System, Partial Differential Equations

SKILLS

Python, C++, C, Tensorflow, Pytorch, Computer Vision, Deep Learning, Research

INDUSTRIAL EXPERIENCE

Gatik AI, Research Engineer, Toronto Sep 2020 – Present

- Research and develop long-range multimodal perception and sensor fusion for autonomous delivery.
- Coordinate research projects with universities and academic labs.
- Correspond with the executives of the third-party LiDAR, radar companies for advanced sensor solutions.

Google AI Research, AI Resident, New York City Jun 2018 – Aug 2020

- Researched on 3D vision and geometric representation under Ameesh Makadia and Noah Snavely.
- Developed a novel deep learning algorithm for large motion relative camera pose estimation that achieves state-of-the-art performance.
- Published a first-authored paper at CVPR and co-authored paper at NeurIPS.
- Designed and experimented with various models and ran large scale distributed training in Tensorflow.
- Designed and implemented high-performance data pipeline to generate large scale wide-baseline stereo image datasets from panorama images in Tensorflow.
- Contributed to the engineering infrastructure for 3D vision and graphics in Tensorflow.

NVIDIA, Deep Learning Research Intern, Toronto May 2017 – Aug 2017

- Conducted research on deep learning in animation and pose estimation for robotics using domain transfer.
- Led a project to build the perception part of a robot trained to play Domino with human in the real world.
- Designed and trained a multi-stage convolutional neural network to localize the Domino card and estimate their poses using synthetic data and achieved competitive performance in real world without fine-tuning. Demonstrated at ACM SIGGRAPH 2017. (Video: https://youtu.be/5olgFSYM_Kw?t=88)
- Implemented the phase-functioned neural network for animation character control in C++.
- Maximized the efficiency of labeling motion capture data by automating the process using PCA.

PUBLICATION

[1] **Kefan Chen**, Noah Snavely, Ameesh Makadia, "Wide-Baseline Relative Camera Pose Estimation with Directional Learning," *Proceedings of Computer Vision and Pattern Recognition (CVPR)*, 2021.

[2] Jake Levinson, Carlos Esteves, **Kefan Chen**, Noah Snavely, Angjoo Kanazawa, Afshin Rostamizadeh, Ameesh Makadia, "An Analysis of SVD for Deep Rotation Estimation," In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020. (https://arxiv.org/abs/2006.14616)

ACADEMIC EXPERIENCE

UofT Machine Learning Group, Research Assistant Feb 2017 – May 2018

- Researched on Motion Generation using Adversarial Training supervised by Prof. Sanja Fidler.
  - Proposed using Gated Graph Sequence Neural Network (GGS-NN) with a soft attention mechanism to learn the spatial-temporal representation for motion capture data.
  - Implemented the Gated Graph Sequence Network with adversarial training in Pytorch.
  - Implemented Wasserstein GAN, Least Squares GAN, and Deconvolutional GAN.
- Researched on Homography Estimation for Sports Analytics, supervised by Prof. Raquel Urtasun.
  - Designed and implemented a convolutional neural network to localize the hockey rink and estimate the homography between the template and the rink in the frames from broadcast videos.
  - Implemented ResNet, DenseNet and spatial transformer network in Tensorflow and Pytorch.

AWARDS & SCHOLARSHIPS

- Dean's Honor List, Department of Electrical and Computer Engineering 2014 – 2017
- Summer Research Studentship, Department of Electrical and Computer Engineering May 2016
- University Entrance Scholarship, University of Toronto Sep 2014