Large-Scale, Real-Time 3D Image Reconstruction Using Multi-View Stereo Algorithms

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Project Overview

The goal of the project is to implement a system that takes a large-scale set of two-dimensional images and output a three-dimensional stereoscopic image accurately in real-time.

The focus will be on creating and optimizing a system that integrates structure-from-motion (SfM), Clustering Views for Multi-view Stereo (CMVS), Patch-based Multi-view Stereo Software (PMVS), and Poisson Surface Reconstruction (PSR).

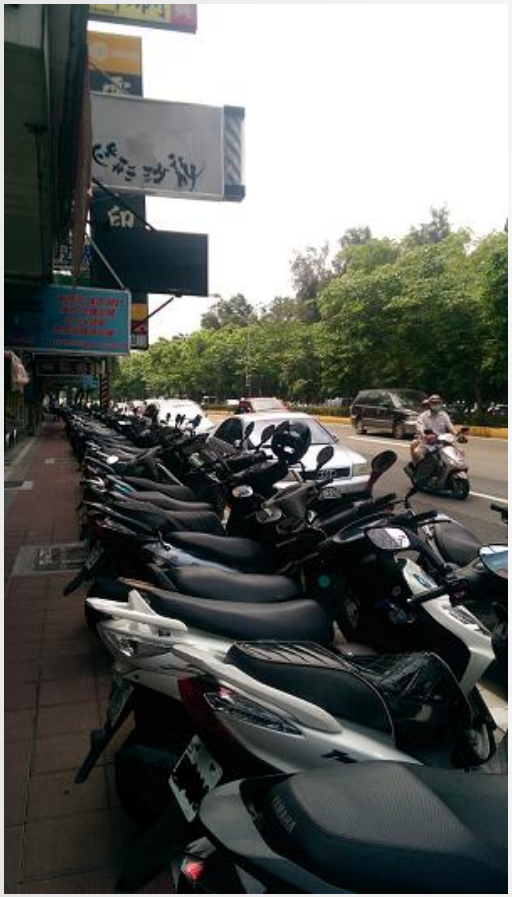
Progress

- Fixed and set up work computer. Clean installed Ubuntu 14.04.
- Downloaded source codes for Bundler/SfM, CMVS, PMVS2, and PSR.
- After tweaking the Makefile and the Bash and Perl scripts, got Bundler/SfM V0.3 to compile and run. Then got Bundler V0.4 working to ensure compatibility with the latest CMVS/PMVS software.
- After fixing some lines of problem code, editing the Makefiles, and downloading relevant packages and libraries, successfully got the individual source codes for CMVS, PMVS2, and PSR working.

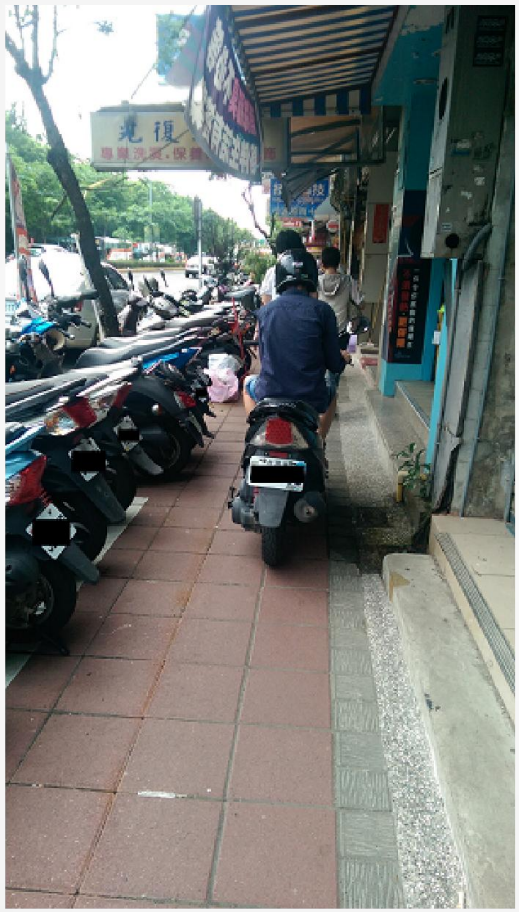
Upcoming Goals

- Start integrating Bundler/SfM with CMVS.
- Develop a better understanding of the PMVS2 algorithm/software, which currently appears to be the biggest bottleneck when trying to achieve real-time performance for a large set of images.
- Continue reading research papers related to multi-view stereo algorithms.

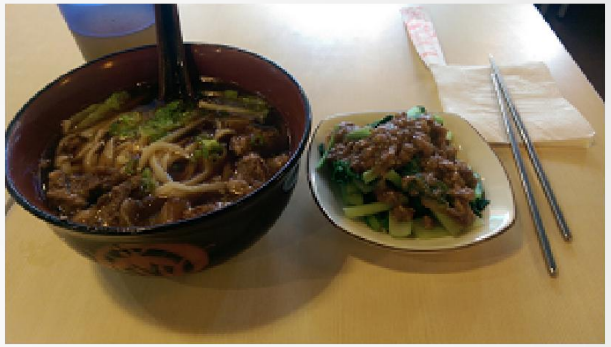
Culture



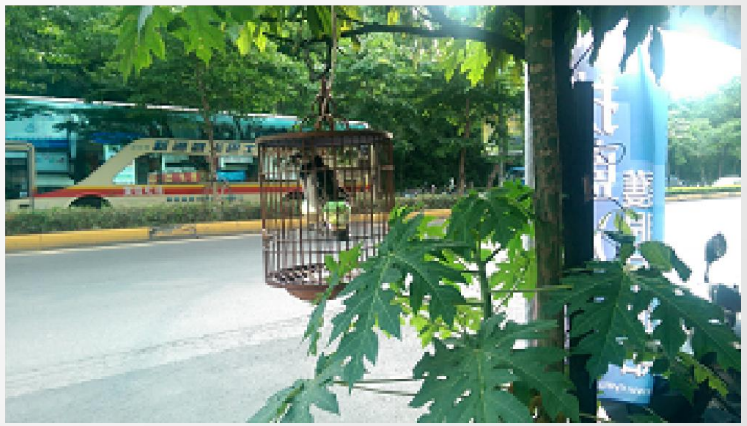
Everyone uses scooters here.



Scooters can be operated and parked on the sidewalk.



Taiwanese beef noodle soup – very popular dish



This bird lovingly shrieks at you out of nowhere as you pass by.

Acknowledgments

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