

XIANGLONG HU

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EDUCATION

Master of Science in Computer Science

New York University

Expected December 2019

New York City, U.S.

Exchange Student

University of California in Berkeley

September 2016 - December 2016

Berkeley, U.S.

Bachelor of Science in Physics

Fudan University

September 2013 - July 2017

Shanghai, China

PROJECTS

Microsoft's Language Server Protocol for Wolfram *Mathematica* Contributor, Open Source Project, hosted on [Github](#) Sep 2018 - Now

- **Design:** Type checking, logging, and unit test systems were constructed to facilitate development. The server was implemented in Wolfram *Mathematica* in a functional programming paradigm and immutable data. Developed in a bootstrapping style.
- **Features:** Providing grammar diagnostics, hover, completion, resolving, etc, which are missing in Wolfram *Mathematica* frontend and other extensions. Alpha version client in javascript and typescript released on [VS Marketplace](#).
- The client communicated with the server by socket through local port abiding JSON-RPC protocol. The language service can directly work on any client supporting LSP like Emacs and Vim. To be integrated with Debug Adaptor Protocol.

Raft Consensus Protocol Distributed System, New York University

Oct 2018 - Dec 2018

- **Virtualization & GRPC:** Docker, Kubernetes, VirtualBox and Vagrant were used to encapsulate servers and clients to form a real P2P network. APIs of client-server communication generated through the grpc protocol in Go.
- Full APIs of basic Raft implemented, including voting and log replication. Implemented a remote hash table (key-value store) server-client service. The P2P network could commit logs correctly with server failures and rejoining.

Harmonic Coordinates for Character Articulation Geometric Modeling, New York University

Mar 2018 - May 2018

- **Mathematical Methods:** Introduced a cage-based continuous deformation method using Laplacian weights of mesh models in linear time. This made mesh model deform more naturally with handle points.
- **Computational Geometry:** Implemented the full functionalities with external cage control. Designed a frontend with ImGui for users to change parameter and deform in real-time. Reduced 3D-mesh model to 2D and re-triangulated. Intensive usage of mesh processing library libigl and linear algebra library Eigen to do transformation and differentiation.

MiniC Compiler Compiler Construction, New York University

Sep 2018 - Dec 2018

- Designed and verified programming idioms and attributes in a functional style.
- Implemented a scanner, parser and MinARM32 (a subset of ARM32) code generator for MiniC (a subset of C) in HACS which is a frontend based on CRSX higher-order rewriting engine.

RESEARCH EXPERIENCE

Laboratory of Computer Vision and Machine Learning School of Data Science, Fudan University

May 2017 - Dec 2017

- **Purpose:** Mathematically formulated a hierarchical Bayesian neural network and adapted it to incremental learning to eliminate catastrophic forgetting when new classes appeared. Further simplified with variational inference to model true distribution.
- **Experiment:** Network of Gaussian probabilistic weights implemented with local reparametrization and practical Monte Carlo in Pytorch to expedite computation. Setting up a remote Linux server from scratch. Manage environments through Anaconda. Automated training based on scripts ran on servers with Cuda GPUs.

PATENT APPLICATION

Apparatus for Acoustic Wave Generation and Experiments Department of Physics, Fudan University

Jun 2017 - Nov 2017

- **Functionality:** Measuring and analyzing acoustic properties on Android smartphones for pedagogical purposes, primarily Fourier transformation of acoustic waves, real-time data processing and rendering.
- **Techniques:** Designed the frontend, which provided interactive charts and experiments parameter settings, and backend in Android. Interacted with hardware by thread programming. Data export supported.
- **Publishment:** Research results published in *Physics Experiments*, funded by the National Natural Science Foundation (China).

SKILLS

Programming Languages: C/C++, Python, Go, Java, Wolfram *Mathematica*, MATLAB, LabVIEW, \LaTeX , R.

Framework: Arduino Platform, Android, PyTorch, NumPy, libigl, Eigen

Software: Vagrant, Microsoft Visual Studio, JetBrains toolset, Emacs, Vim.