DOU, JIN

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EDUCATION

University of Southern California, USC — Los Angeles, United States
Master of Science — August 2018 - May 2020
Major: Computer Science — GPA:3.92/4.0

Dalian University of Technology, DUT (Class A of Double Top University Plan, 211 & 985 Project) — Dalian, China
Bachelor of Engineering — September 2014 - July 2018
Major: Computer Science and Technology — GPA:3.79/4.0
Minor: Finance — GPA:3.20/4.0

HONORS & AWARDS

Scholarship for Excellent Learning, Dalian University of Technology (top 15%) — 2017/2016/2015
Merit Student, Dalian University of Technology (top 3%) — 2016
Ethics Scholarship, Dalian University of Technology (top 10%) — 2015

INTERNSHIP EXPERIENCE

MIT Media Lab, Brain Computer Interface Research Intern — *Massachusetts Institute of Technology, United States*
Binary Classification of Auditory and Visual Attention (Python, MATLAB) — June - October 2019

- Mainly worked on the AttentivU project of the Fluid Interface Group. Worked remotely from September to October.
- Designed experiments for data collection after exploring the literature on related paradigms.
- Implemented programs for presenting stimulus and recording markers based on PsychoPy in python.
- Preprocessed the collected data using MNE in python, and EEGLab in MATLAB.
- Modified an existed auditory attention model with a new objective function based on Keras and Scikit-learn in Python.
- Built models in Python to perform Time-Frequency Analysis on Visual Evoked Potential to achieve high accuracy.

Medicinovo Co. Ltd. , Machine Learning Intern — *A health care big data company located in Beijing, China*
Abnormal Electroencephalogram (EEG) Detection (MATLAB, Python) — December 2017 - May 2018

- Used EEGLab toolbox in Matlab for data preparation and preprocessing.
- Built model to detect abnormal EEG segment (binary classification problem). The small dataset was obtained from a hospital in Beijing and was labeled by professional doctors.
- Implemented a feature extraction framework based on python 3.5 involving convolutional neural network (CNN), recurrent neural network (RNN), and other statistical methods. Experiment results showed that CNN performs better than RNN in dealing with short segment of Epileptic EEG.

Epileptic Seizure Electroencephalogram (EEG) Data Processing (CUDA, C++, MATLAB) — August 2017

- Designed and implemented a part of a C++ class, which provided discrete wavelet transform (DWT) and data normalization functionality based on CUDA, with the application of Resource Acquisition Is Initialization (RAII) and handle-to-data model.
- Wrote MATLAB program to verify the effectiveness of discrete wavelet transform ability provided by the C++ Class.

Parallel Computing Library Implementation (CUDA, C++) — June – July 2017

- Built a part of the company's GPU computing library in C++ based on Compute Unified Device Architecture (CUDA) including several matrix operations: matrix multiplication, and matrix inverse (invertible larger than 1500 dimensions).
- Implemented the matrix inverse function via CUDA based on Gauss-Jordan algorithm, and optimized this function by implementing semaphores, which is not provided by CUDA, and using CUDA's atomic operation.

PROJECT RESEARCH

Visual Evoked EEG Data Enhancement (Python), *USC* Present

- Exploring the combination of Autoencoder and Gaussian Mixture Clustering to enhance the raw visual evoked EEG.

Accelerate Scientific Computation Using GPU (CUDA, C++) September 2018 - Present

Professor Ivan Bermejo-Moreno, *Computational Aerospace Lab, USC*

- Applied synchronous callback and interchangeability programming to the implementation of Iteration Parallelism.
- Separated the CUDA threads allocation and the detailed computation (built in the form of callback function) into two parts. The generalized threads-allocation function can accommodate three-layer nested loop.
- Now using CVODE_CUDA to accelerate solving the stiff chemical kinetics problem in reactive flow simulations.

Weather Search Web Application (Angular 9, Bootstrap 4, Android 8, Express), *USC* September - November 2019

- Full stack development of a weather search application with responsive design.

Octane - Ethane-like Software-Defined Network (Linux Socket, C/C++), *USC* February - April 2019

- Developed a Software-Defined Network emulator which supports several network protocols.
- Separated and implemented control panel and data panel. A primary router oversees network flow control by sending control message to the secondary routers, which are in charge of data transmission based on the control message.

Hypermedia – Creation and Consumption (QT, C++) November - December 2018

Parag Havaldar, *Multimedia System Design Class, USC*

- The target is to explore the creation and consumption of Hyperlinked video, which contains embedded, user-clickable anchors allowing navigation between video and other hypermedia elements.
- Implemented the backend and part of the frontend of this hypermedia player.
- Solved the problem of limited host memory size by implementing a frames swap class which can dynamically load and unload video frames. Applied multithreading to it to achieve prefetching of video frames.

Multi-User Scientific Visualization Based on MR (Unity) September - November 2018

Professor Aiichiro Nakano, *Materials Genome Innovation for Computational Software, USC*

- Collaborated with Microsoft MR Academic to develop an application for visualizing molecular structure based on Unity 3D in Mixed Reality environment.
- Worked in a team to accomplish multi-player functionality, allowing players to synchronize motion and position of molecules by building a network management framework.

Used Cellular Automaton to Simulate Throughput at Airport Checkpoints (MATLAB), *DUT* January 2017

- Built a cellular automaton to simulate the behavior of passenger crowds at airport security checkpoints.
- Designed the cellular automaton with two layers, presentation and calculation layer, to make it more extensible.

SKILLS

- Brain Signal Analysis: Abnormal EEG, Visual Evoked Potential, Auditory Evoked Potential, Experiment Design.
- Frameworks: TensorFlow, QT, Unity, CUDA, MPI, OpenMP, Angular, NodeJS.
- Programming: C/C++, Python, MATLAB, Web Languages, Git, CMake.
- Research Tools: MNE, EEGLab, PsychoPy

EXTRA-CURRICULAR ACTIVITIES

The Second Violist in the University's Orchestra, DUT September 2014 - May 2018

- Took part in large-scale concerts held in every semester.

Member in DUT Bicycle Traveler Association's Summer Expedition Practice Activity, DUT July - August 2015

- Rode 2000 kilometers across the northeast of China in 21 days, took notes of the environment along the journey.

Volunteer in Faculty's Voluntary Association, DUT September 2014 - July 2015