Chen, Zihan

Electrical and Computer Engineering, University of Toronto
Applying for full time software developer

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EDUCATIONAL QUALIFICATIONS

University of Toronto, Master of Applied Science *09/2015 - Present*
Overall GPA: 4.0/4.0 | Computer Engineering | IEEE Student Member
Research assistant at Signal Integrity Laboratory | Supervisor: Piero Triverio
Research: High Performance Computing, Numerical Computing, Computer Graphics, Machine Learning

Zhejiang University, Bachelor of Engineering (Honours) *09/2011 - 06/2015*
Overall GPA: 3.85/4.0 | Information Engineering | Ranking: Top 5% of 149 students
Research and Coursework: Computer Vision, Algorithms and Data Structures, Computer Organization, Software Engineering, Operating Systems, Embeded System, Applied Electromagnetism

University of California, Davis *07/2014 - 09/2014*
Global Research Experience in Advanced Technologies (GREAT) Program | Research Internship

PROGRAMMING SKILLS

Language: Python, C/C++, Verilog HDL, MATLAB, Java, Bash/Perl, html/css, Sql
Toolkits & Software: Visualization Toolkit (VTK), Git, MPI/OpenMP/CUDA, Hadoop/MapReduce, Docker

RESEARCH & PROJECTS

Thesis: Computational Fluid Dynamics Toolkit for Vascular Modeling and Simulating *2015 - 2017*
We developed a toolkit compatible with SimVascular for non-invasive coarctation severity assessment using computational fluid dynamics.

- Creating the 3D reconstructing geometry files of the cardiovascular system from its MRI images using vtk marching cube iterations and unstructured meshing (Delaunay tetrahedralizations) via TetGen.
- Implementing MPI for solving the Navier-Stokes equations via Finite Element Analysis in parallel.
- Achieving: **93%** of studied cases show great consistency with the clinical data.

Course projects:

N-Gram AutoComplete, Hadoop/Map Reduce *2017*

- Building N-Gram Library from wiki datasets and creating Language Model based on its probability of occurrence. Using MySql Database for Querying.
- Accessing database and showing auto completion results on local host via JQuery, PHP and Ajax.

Recommender System, Hadoop/Map Reduce *2017*

- Implementing the item collaborative filtering algorithm to generate the co-occurrence matrix and the user-specific rating vector based on the users' rating history from the Netflix Prize Data Set.
- Matrix computation with Map Reduce jobs to find out the recommending movie(s) for specific users.

2D Finite Element Analysis on Transmission Line problems, Numerical Computing *2016*

- Computing the electric distribution on the cross section of Transmission Line by solving Maxwell's equations via FEM. Comparison of the results from my solver and COMSOL shows very good consistency.
- Parallelize the matrix manipulation with MPI. For 5000 elements scale, implementing with 1, 2, 4, 8, 16, 32, 64 cores, the performance is enhanced by 1.0, 1.99, 3.93, 7.65, 10.28, 12.71, 13.74, respectively

Face Recognition and Gender Classification, Machine Learning *2016*

- Implementing K-Nearest Neighbors (L2 distance) algorithm for 30 celebrities (15 actors and 15 actresses)
- With 100 cases for training, 10 cases for validation, 10 for test, achieving 68% and 71% accuracy on test set for face recognition and gender classification, respectively.

Handwritten Digit Recognition with Neural Networks, Deep Learning *2016*

- Implementing Perception and Hidden-Layer neural network with mini-batch gradient decent algorithm to classify Hand-Written Digits from MNIST dataset.
- Achieving 92% (within 95 training epoch) and 97% (within 485 training epoch) accuracy on test set with Perception and Hidden-Layer neural networks, respectively.

High Resolution Stereoscopic Display System *2014 - 2015*

- Video streaming Face Recognition by OpenCV Haar cascading classifier and AdaBoost algorithm. Using Integral Image to accelerate processing.
- Stereoscopic Visual Reconstruction for auto stereoscopic display via OpenGL.

WORK EXPERIENCE

Teaching Assistant, University of Toronto

CSC 258 Computer Organization (Winter 2016)
ECE 253 Digital & Computer System (Fall 2016)
APS 105 Computer Fundamentals (Winter 2016)
CSC 180 Introduction to Computer Programming (Fall 2016)

CONFERENCE AND PUBLICATION

[1] Z. Chen, F. Ballarin, G. Rozza, A. M. Crean, L. Jimenez-Juan, P. Triverio, "Non-invasive assessment of aortic coarctation severity using computational fluid dynamics: a feasibility study," in 20th Annual Scientific Sessions, Society for Cardiovascular Magnetic Resonance, Washington, DC, Feb. 1--4 2017

For more project and personal information, visit my website: zihanchen-ece.github.io