Zhouhan Lin

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EDUCATION BACKGROUND

Aug. 2008-Jul. 2012 School of Electronics and Information Engineering, Harbin Institute of Technology
Degree: Bachelor GPA: 85.6/100 GPA Rank: 19.0%
Honored Graduate of HIT (top 10%) **Excellent Graduation Thesis (top 5%)**
People's Scholarship **Shinchang Corporation Scholarship**

Aug. 2012-2014(Exp.) School of Electronics and Information Engineering, Harbin Institute of Technology
Degree: Master (Expected)
First-class Entrance Scholarship **First-class Studentship**

STANDARD TESTS

TOEFL 98 (Reading 28 Listening 27 Speaking 22 Writing 21)
GRE 320+3.5 (Verbal: 152 – 53% Quantitative: 168 – 97% Analytical Writing: 3.5 – 30%)

INTERNSHIP EXPERIENCE

Jul. ~Sep., 2013 **Yoshua Bengio's deep learning group, LISA, Université de Montréal, Canada**

- Use Gated Autoencoders to learn relations between images
- Tried inference and sampling on both binary and real-valued Gated Autoencoders
- Working with **Yoshua Bengio** and **Roland Memisevic**

Feb. 2012 **Chinese Academy of Sciences, Ningbo Institute of Materials Tech. & Eng.**

- **Independently** implemented **QR** algorithm in **C** and **CUDA** without using math libraries, optimized the algorithm for large conjugate symmetric matrixes, and transferred the algorithm into a parallel version using CUDA on GeForce GTX 460
- Got familiar with GPU-equipped **supercomputers** (ShuGuang-1000)

Jul. 2011 **Twenty First Century Aerospace Technology Co., Ltd, Beijing**

- Attended trainings of the preprocessing of remote sensing images, including radiation correction, geometric correction, image matching and fusion, image classification

PUBLICATIONS

1. Haicheng Qu, Junping Zhang, Yushi Chen, Hao Chen, **Zhouhan Lin**, Parallel Implementation for SAM Algorithm based on GPU and Distributed Computing, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), pp. 4074-4077, 2012.
2. Haicheng Qu, Junping Zhang, **Zhouhan Lin**, Hao Chen, Bormin Huang, GPU Acceleration of Simplex Volume Algorithm for Hyperspectral Endmember Extraction, Proc. of SPIE, vol. 8539 85390b-1, 2012. (oral)
3. HaiCheng Qu, Ye Zhang, **Zhouhan Lin**, Hao Chen, Hyperspectral Image Feature Extraction Accelerated by GPU, Proc. of SPIE, vol. 8539 85390m-1, 2012. (oral)
4. Yushi Chen, **Zhouhan Lin**, Changbo Qu, Riemannian Manifold Learning based K-Nearest-Neighbor for Hyperspectral Image Classification, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2013. (oral)
5. Yushi Chen, Changbo Qu, **Zhouhan Lin**, Supervised Locally Linear Embedding based Dimension Reduction for Hyperspectral Image Classification, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2013.
6. **Zhouhan Lin**, Yushi Chen, Xing Zhao, Gang Wang, Spectral-Spatial Classification of Hyperspectral Image using Autoencoders, International Conference on Information, Communications and Signal Processing (ICICS), 2013. (oral) (I tuned parameters of the model without any clusters or GPUs, and within 2 weeks.)
7. Yushi Chen, **Zhouhan Lin**, Xing Zhao, Gang Wang, Deep Learning Based Classification of Hyperspectral

Imagery, (Submitted, Under review)

RESEARCH EXPERIENCE

Jul. 2011 - present **Involved in several researches in Institute of Image and Information Technology of HIT**

- Deep Learning
  - Image Classification using Autoencoders, Contractive Autoencoders, Denoising Autoencoders, and Stacked Autoencoders. And tuned these networks to outperform SVM
  - Generating MNIST digits by sampling on Denoising Autoencoders and Gated Autoencoders
  - Inspected the working principle of Restricted Boltzmann Machine and its application on MNIST data
- Manifold Learning
  - Proposed a Riemannian manifold learning-based kNN classifier,
  - a supervised version for LLE algorithm, and
  - a Riemannian manifold learning-revised Maximum Likelihood Estimator.
- Feature Extraction
  - Independently implemented Kahunen-Loeve Transformation in C and CUDA without using ready-made mathematical libraries
- Parallel and distributed computing for Machine Learning and Image Processing
  - Implemented and optimized a parallel edition of Simplex Volume Algorithm on NVidia GeForce 560 using CUDA, yielding a total speedup of around 300 times as compared to its CPU counterpart
  - Implemented Spectral Angle Mapping algorithm on the same hardware environment. The total speed up is around 80 times
  - Built up a 4-node cluster by both Matlab Distributed Computing Engine and Hadoop

May 2011-Jun. 2011 **Designed a general signal source for communication system based on FPGA**

- Simulation of AM, FM, 2ASK,2FSK, 2PSK, 16QAM and GMSK signals
- Hardware realization

Oct. 2008-Feb. 2009 **Won a Freshman Foundation for research on heating radiators**

PATTERNS

National Invention Patent: Yushi Chen, Zhouhan Lin, A nonlinear dimensionality reduction method for hyperspectral data, Patent No. 201310087912.2

SKILLS

- Familiar with **C** programming, **CUDA** parallel programming, **Linux** operating system and **MATLAB**
- Familiar with **Python**, **Theano**, NumPy, SciPy, and peripheral libraries. (Instead of MATLAB I use Python to code up my research algorithms.)
- Preliminary understanding of Hadoop, C++, Open CV and Open CL
- Familiar with deep learning models, e.g., Autoencoders, RBMs, Convolutional Nets and Sparse Coding
- Familiar with a wide variety of Machine Learning algorithms, and have research experience in Manifold Learning
- Familiar with **Adobe Photoshop**, AutoCAD, ENVI, ERDAS

EXTRACURRICULAR ACTIVITIES

Nov. 2010 **Attended China National Model United Nations in Chongqing (CNMUN 2010)**

- One of the 4 selected delegates on behalf of Harbin Institute of Technology

Feb.2009-Jun.2011 **A member of Harbin Institute of Technology International Communication Association**

- Involved in establishing the 1st and 2nd Model United Nations Conference in HIT

- Leader of TOEFL-Club, Language Department

Jan.2010-Jun.2011 **A member of Students' Union in School of Electronics and Information Engineering**

- Established WuSi Forum, which provides schoolmates with a series of lectures given by famous professors & outstanding students
- Nominated as Vice-Chairman of the Students' Union

LANGUAGE SKILLS

English:	Fluent	**French:**	30 hours of learning
Chinese-Mandarin:	Fluent	**Chinese-Wu:**	Mother Tone

OTHER HONORS AND CERTIFICATES

2011	University-level Excellent Youth League Member
2010	Certificate of appreciation for participating in China National Model United Nations Conference
2010	Award of Excellence in University-level Project-based English Essay Contest
2010	Outstanding Research Report Award in Social Survey
2008	Freshman Foundation for research on heating radiators

SELF DESCRIPTION

- I am very interested in machine learning algorithms. Although my major is into EE, I'm never an outsider of Computer Science. In addition of my major course, I began to take a lot of courses in the C.S. department as an audition student back in my undergraduate years. These courses include **Operating Systems** (Taught by Zhigang Sun) and **Pattern Recognition** (Jiafeng Liu). After **Coursera** established, I began to learn from the web. So far I've got two Stanford courses finished with certificate on that website, including **Machine Learning** (Andrew Ng) and **Algorithms** (Tim Roughgarden).
- Here is a terse list of some of the algorithms that I have coded up: K-Nearest-Neighbors (In C, Python and MATLAB), PCA (Coded from bottom up, in C and CUDA), LDA (MATLAB), Simplex Volume Algorithm (in C and CUDA(**300 times** faster!)), Riemannian Manifold Learning (MATLAB), Autoencoder, Denoising Autoencoder, Contractive Autoencoder, Gated Autoencoder and their corresponding stacked deep architecture (Python, with Theano). And there are interesting tools for image processing and encrypting your file. Please refer to my home page for more details.
- I have once built up a 4-node cluster using Hadoop and Matlab Distributed Computing Engine in our lab, but since I can't write Java, I just ran the demos and didn't use it too much.
- I like sketching, Chinese Painting and table-Tennis.

MAIN COURSES

- **Mathematics:** Linear Algebra and Analytic Geometry, Mathematical Analysis for Science & Technology Majors, Mathematical and Physical Equations, Probability Theory and Mathematical Statistics, Complex Function and Integral Transformation, Game Theory, Matrix Analysis, Numerical Analysis
- **Signal Processing:** Signals and Systems, Random Signal Analysis, Modern Statistical Signal Processing, Adaptive Signal Processing, Digital Signal Processing, Digital Image Processing
- **Computer Science:** Fundamentals of Computer Application II, C Programming language, Fundamentals of computer software, Operating Systems (audit), Algorithms I (Coursera), Computer Graphics, Computer Communication Networks, Pattern Recognition, Machine Learning (Coursera)
- **Physics and Circuits:** College Physics II, Electromagnetic Field & Wave, Electric Circuit II, Basics of electronic circuit, Digital Logic Circuits and Systems, Microwave Technology II, Electronic Circuits for Communication, Communication Principle II