Chang **Liu**

Software Development · Embedded Systems · Data Science

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Education

KTH Royal Institute of Technology (KTH)

Stockholm, Sweden

M.Sc. Major: Embedded Systems, Minor: Innovation & Entrepreneurship — *2015 - PRESENT*

- **Machine Learning, Data Analysis, Software Development**, Internet of Things, ASIC Design and FPGA, System Modeling

Eindhoven University of Technology (TU/e)

Eindhoven, The Netherlands

M.Sc. Major: Embedded Systems, Minor: Innovation & Entrepreneurship — *2014 - 2015*

- Computer Architecture, Embedded Software and Hardware, Multiprocessors, Network-on-Chip, Wireless Networks, Digital Design

EIT Digital Master School

The Netherlands & Sweden

Innovation & Entrepreneurship — *2014 - PRESENT*

- **Innovation & Entrepreneurship, Business Development, Marketing Research, Financial Analysis, Product Development**

University of Electronic Science and Technology of China (UESTC)

Chengdu, China

B.Sc., Electronics and Computer Science related subjects, **GPA: 88%** — *2010 - 2014*

- **Excellent Graduation Thesis**: "*Modeling, Control Algorithm Design and Experiments based on Euler–Bernoulli Beam.*"

Skills & Competences

Programming Python, C, C++, Java, Apache Spark, Scala, VHDL, Verilog, CUDA, SystemC (and TLM)

Tools Linux Environment, Shell Script, LaTeX, Git, Travis CI, Eclipse, Amazon EC2, Microsoft Office

Languages English, Chinese (Mandarin)

Business Innovation & Entrepreneurship, Business Development, Marketing, Financial Analysis, Product Development

Personality Team-player, Problem-solver, Motivated, Result-oriented, Open-minded, Ambitious, Curious, Proactive, Adaptive

Experience

Research

Ericsson

Stockholm, Sweden

Internship and Master Thesis — *Jan. 2016 - PRESENT*

- **Machine Learning and Data Analysis.** Recurrent Neural Network (RNN). **Python and Amazon EC2**.
- **Continuous Integration and Delivery. Lean & Agile** Software Development. **Java**.
- **Large scale software architecture.**

Robotics Institute, UESTC

Chengdu, China

Research Assistant — *Sep. 2012 - Jun. 2014*

- Design and development of intelligent controlling algorithms and solutions for robot manipulators and marine risers.
- Implementation of the algorithms on real robots. Accomplishment of several papers published.

Projects

Personal Projects on Machine Learning

Stockholm, Sweden

KTH Royal Institute of Technology (KTH) — *Sep. 2015 - PRESENT*

- Machine Learning (ML) algorithms analysis and programming using **Python**.
- Audit Advanced Machine Learning Course in KTH.
- Study and practice Apache Spark and Scala language.

System Design using SystemC (C++) and Transaction Level Modeling (TLM)

Stockholm, Sweden

KTH Royal Institute of Technology (KTH) — *Sep. 2015 - Nov. 2015*

- System design and implementation using SystemC: Bus, RAM and ROM, Channel and Interface, Transaction Level Modeling, Concurrency and Time, Process and Thread, Simulation, Debugging, Signal and Data Type.

Digital Design using VHDL based on Altera Cyclone-V FPGA *Stockholm, Sweden*

KTH Royal Institute of Technology (KTH) *Sep. 2015 - Nov. 2015*

- Sequential Logic, Resolution Function and Databus. Latch, Flip-flop, and FSM. RTL and Synthesis. Datapath and Microcontroller.
- Tools: Quartus II and ModelSim.

Audio Processing based on Xilinx's Spartan FPGA using Verilog *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Apr. 2015 - Jun. 2015*

- Design & optimization: pipelining, re-timing, folding, unfolding, strength reduction, re-use of partial results, vectorization, etc.
- Implementation media: VLSI, FPGA, Digital Signal Processors. ISE Design Suite.

JPEG Decoding based on Xilinx's MicroBlaze Multiprocessor Embedded Platform *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Feb. 2015 - Jun. 2015*

- JPEG Decoding algorithm and Image Processing.
- Focused on the impact of multiple processors, accelerators, distributed shared heterogeneous memory hierarchy.
- Various parallel strategies. DMAs and Network-on-Chip Communication with limited bandwidth.

Dynamic Memory Management for High Performance and Low Power Cost *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Dec. 2014 - Jan. 2015*

- Use smaller memories/buffers: Scratch Pad Memory (faster and less energy consuming)
- Reduce the number of memory accesses by optimizing C code: Loop Transformation, Temporal and Local Data Reuse, etc.

Bitcoin Mining based on NVIDIA's GPUs using CUDA *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Oct. 2014 - Dec. 2014*

- Solve the hash algorithm for mining "fake" bitcoins by utilizing GPU's powerful data parallelism and multi-thread features.
- GPU architecture, multi-thread computing, shared memory. **CUDA C and OpenCL.**

Intel: Processor Design Space Exploration based on the Silicon Hive Architecture *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Sep. 2014 - Oct. 2014*

- Design and optimize a low power VLIW processor for the ECG application using Intel's TIM language.
- In particular focus on the trade-off between performance and energy consumption.

Wireless Sensor Network (WSN): Automatic Agricultural Monitor and Control *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Sep. 2014 - Dec. 2014*

- Design and evaluate a WSN based on a bunch of Atmel's low-power MCUs using C.
- Implement Beacon-enabled CSMA-based MAC protocol (IEEE 802.15.4) and hierarchy routing layer.

Virtual Environment: Panum's Fusional Area Approximation *Eindhoven, The Netherlands*

Eindhoven University of Technology (TU/e) *Sep. 2014 - Dec. 2014*

- Design and conduct an experiment to measure the shape of a fusion area.
- Based on Fontys' VR-Cave laboratory and WorldViz Vizard (**Python**).

Honors & Awards

Scholarships

2014 **Scholarship of Excellent Graduate** Outstanding performance during entire undergraduate time *UESTC, China*

2013 **Jiuzhou Scholarship** Only two students were honored *Jiuzhou Group, China*

2012 **Suzhou Industrial Park Scholarship** Top 5% *Suzhou Industrial Park, China*

2011 **The People's Scholarship** Great grades in the first year *UESTC, China*

Extracurriculums

Business Development. Market Research. Presentation and Communication. *Finland & The Netherlands*

EIT Digital Summer School *Aug. 2015, Helsinki, Finland*

EIT Digital Winter School *Feb. 2015, Eindhoven, The Netherlands*

Volunteer on ICONS 2013 *Chengdu, China*

The 3rd IFAC International Conference on Intelligent Control and Automation Science (ICONS 2013) *Sep. 2013*

Volunteer on ICSR 2012 *Chengdu, China*

International Conference on Social Robotics (ICSR 2012) *Oct. 2012*