Chang **Liu**

Software Development · Embedded Systems · Data Science

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Education

KTH Royal Institute of Technology (KTH) — *Stockholm, Sweden*

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

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

University of Electronic Science and Technology of China (UESTC) — *Chengdu, China*

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

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

Skills

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

Tools Linux Environment, LaTeX, Git, Eclipse, Microsoft Office

Languages English, Chinese

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

Experience

Research

Ericsson AB — *Stockholm, Sweden*

Internship and Master Thesis — *Dec. 2015 - PRESENT*

- Unstructured **log data analysis using Machine Learning** based on Component Based Architecture.
- Continuous Integration and Agile Software Development. **Java**.
- Scrum Team.

Robotics Institute, UESTC — *Chengdu, China*

Research Assistant — *Jul. 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 based on Machine Learning — *Stockholm, Sweden*

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

- Machine Learning (ML) algorithms analysis and programming using **Python**.
- 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*

Publications

Vibration Control of a Timoshenko Beam System with Input Backlash. *IET Control Theory & Applications (IF: 2.048)*

Wei He and Chang Liu *vol. 9, no. 12, pp. 1802-1809, 2015.*

Boundary Control for Flexible Mechanical Systems with Input Dead-Zone. *Nonlinear Dynamics (IF: 2.849)*

Shuang Zhang, Wei He, Shuangxi Nie and Chang Liu *vol. 82, no. 4, pp. 1763-1774, 2015.*

Adaptive Boundary Control for a Class of Inhomogeneous Timoshenko Beam Equations with Constraints. *IET Control Theory & Applications (IF: 2.048)*

Wei He, Shuang Zhang, Shuzhi Sam Ge and Chang Liu *vol. 8, no. 14, pp. 1285-1292, 2014.*

Boundary Control Design and Stability Analysis of an Euler-Bernoulli Beam System with Input Backlash. *34th Chinese Control Conference (CCC)*

Xiuyu He, Wei He, Hui Qin and Chang Liu *pp. 1389-1394, 28-30 July 2015*