# Liangqun Lu

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## Education

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**University of Memphis**                                                          **Memphis, T**N
*MS student in Computer Science*                                                   *2017 - Present*
*Thesis area: Machine Learning, Deep Learning, Natural Language*
*Processing, Information Retrieval, Dialogue System and*
*AutoTutor*
Current GPA: 3.73

**University of Memphis**                                                          **Memphis, T**N
*PhD student in Biology Department (Main Advisor: Dr. Bernie Daigle, Jr. )*         *2016 - Present*
*Dissertation area: Machine Learning, Biomarker Discovery and*
*Bioinformatics*
Current GPA: 3.73

**University of Hawaii at manoa**
*M.S. in Molecular Biosciences and Bioengineering (Main Advisor: Lana Garmire)*     **Honolulu, H**I
*Thesis area: Bioinformatics, Cancer Biology and Data*                              *2014 - 2016*
*Integration*
Thesis title: Multi-omic data integration to stratify population in hepatocellular
carcinoma
GPA: 3.60

**China Agricultural University**                                                   **Beijing, China**
*M.S. in Bioinformatics*                                                            *2010 - 2013*
*Thesis area: Bioinformatics, database construction and plant*
*genomics*
Thesis title: Functional database construction on Carbohydrate-active enzymes
GPA: 3.41

**China Agricultural University**                                                   **Beijing, China**
*B.S. in Biological Science*                                                        *2006 - 2010*
Thesis title: FK506 research as an adjuvant treatment of EAE in mice
GPA: 3.56

## Skills

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**Machine Learning**
Formal training in various aspects of machine learning, including feature reduction, regression,
classification, clustering, bayesian network, recommendation system, reinforcement learning.

Be familiar with Deep Learning framework TensorFlow and Keras. Used deep learning architectures autoencoder and DNN in cancer datasets. Used Neural Network language model, Generative Adversarial Network and Reinforcement Learning in dialogue system in AutoTutor.

**Bioinformatics / Computational Biology and Cancer Bioinformatics**
Formal training in bioinformatics, NGS and microarray analysis. Processed the cancer data from TCGA, ICGC and cBioPortal. And involved in driver gene research and cancer evolution.

**Programming Languages**
Extensive programming experience in my previous projects. Being familiar with R (Limma, ggplot2, caret, CMA) and Python (sklearn, pandas, tensorflow, keras). And have finished projects using perl, php, matlab and C++.

**Web Development**
Used ASP.NET MVC to build a new interface for CohMetrix webtool (http://tool.cohmetrix.com/). In 2017 HackMemphis, used Python Django to build a demon one-stop convenience website (https://github.com/LiangqunLu/HackMemphis), Ruby on Rails

**Microbiology and Molecular Biology**
Being familiar with the basic microbiology skills from instructing introductory microbiology course. Exposed to the RT-PCR, ELISA experiments and microarray chips in undergraduate training.

# Experience

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**Computer Science Program, University of Memphis**                                      **Memphis, T**N
*Research Assistant*                                                                     *2017 - Present*
Research on Deep Learning for AutoTutor Systems, models applied including RNN, LSTM, Generative Adversarial Network and Reinforcement Learning

**Bioinformatics Program, University of Memphis**
*Research Assistant*                                                                     
Research on Large-scale Microarray Data Based Feature Selection For Improved                **Memphis, T**N
Molecular Classification, Clinical Subgroup-Specific PTSD Classification and Biomarker      *2017 - Present*
Identification, Multi-omic data integration to discover subgroups at PTSD and Use of deep
learning to predict survival in cancer.

**Institute for Intelligent Systems, University of Memphis**                             **Memphis, T**N
*Summer Intern*                                                                          *2017 Summer*
Summer internship on using ASP.NET MVC (Model-View-Controller, C#) structure to
build a new interface for CohMetrix webtool (http://tool.cohmetrix.com/), including
recaptchas implementation and Socket IP connection.

**Department of Biology, University of Memphis**                                         **Memphis, T**N
*Teaching Assistant*                                                                     *2016*
Instructed the introductory Microbiology. Educated students to know aseptic techniques,
use of microscope, bacteria identification and functions of antibiotics

**Epidemiology Program, University of Hawaii Cancer Center**                             **Honolulu, H**I

*Research Assistant*                                                        *2014 - 2016*
Worked on Time Series miRNA-mRNA integrated analysis reveals critical miRNAs and
targets in macrophage polarization, and integrated RNA-seq, miRNA-seq and Methylation
datasets to classify patients in liver cancer, and deciphering the impact of driver genes on
transcriptions and survival

**Department of Computational Biology, Beijing Computing Center**          **Beijing, China**
*Bioinformatics Engineer*                                                   *2013 - 2014*
Being responsible for RNA-seq analysis, including pipeline management and customer
service. Finished analysis projects, such as on rice, cows and pigs. Instructed RNA-seq
analysis in the next-generation sequencing workshop.

**Bioinformatics Program, China Agricultural University**                  **Beijing, China**
*Research Assistant*                                                        *2010 - 2013*
Built the database of carbohydrate-active enzymes in plants using PHP and Mysql.
Analyzed the conservative domains in five main categories of carbohydrate-active
enzymes and predicted new members and visualized the information Gene Ontology,
KEGG pathways, location and function.

**Department of Plant Science, China Agricultural University**             **Beijing, China**
*Teaching Assistant*                                                        *2011*
Helped instruct the course Bioinformatics, and answered questions from students

# Publications

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**peer reviewed journal articles**

1. **Liangqun Lu \***, Sara McCurdy \*, Sijia Huang, Xun Zhu, Karolina Peplowska, Maarit Tiirikainen, William A. Boisvert, and Lana X. Garmire. 2016. "Time Series miRNA-mRNA Integrated Analysis Reveals Critical miRNAs and Targets in Macrophage Polarization." Scientific Reports 6 (December): 37446.

2. Chaudhary, Kumardeep \*, **Liangqun Lu \***, Olivier B. Poirion, Travers Ching, and Lana X. Garmire. 2017. "Phenotypic Associations of Consensus Driver Genes in Hepatocellular Carcinoma." bioRxiv. doi:10.1101/166090.

3. Chaudhary, Kumardeep \*, Olivier B. Poirion \*, **Liangqun Lu**, and Lana X. Garmire. 2017. "Deep Learning Based Multi-Omics Integration Robustly Predicts Survival in Liver Cancer." Clinical Cancer Research: An Official Journal of the American Association for Cancer Research, January. American Association for Cancer Research, clincanres.0853.2017.

**Conference abstracts/posters**

1. Large-scale Microarray Data Based Feature Selection For Improved Molecular Classification. 16th annual UT-KBRIN Bioinformatics Summit 2017, Burns, TN, April 21-23, 2017

2. Large-scale Microarray Data Based Feature Selection For Improved Molecular Classification. MCBIOS 2017, Little Rock, AR, Mar. 23-25, 2017

3. Association analysis of driver genes of hepatocellular carcinoma with cancer hallmarks. 13th Rocky Mountain Bioinformatics Conference, Aspen, CO, Dec.10-13, 2015

4. Integrative analysis of RNA-seq and miRNA-seq revealed functional miRNAs in the macrophage. Jabsom Symposium, Honolulu, HI, Apr. 15, 2015

5. Pan-cancer analysis based on transcriptional response reveals similarity among different human cancers. The sixth National Conference on Bioinformatics and Systems Biology and International Workshop on Advanced Bioinformatics, Nanjing, China, Oct.06-09, 2014

## Other activities

2015    Volunteer at Humane Society, Honolulu