Hang Gao

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EDUCATION

School of Electronic, Information and Electrical Engineering (SEIEE), Shanghai Jiao Tong University (SJTU), Shanghai, China; *B.E. in Information Security Engineering (expected in July 2017)*
Major GPA: **3.81/4.0**; Ranking: **2/83**

- Chinese National Scholarship in 2015 (56/15437, top 0.3%)
- Rong Chang Science and Technology Innovation Scholarship in 2016 (10/15437, top 0.06%)
- National first prize of the Chinese Undergraduate Mathematical Contest in Modeling (CUMCM), 2015, and "the Best Undergraduate Essay of the Year" (10/25347, top 0.03%)
- Meritorious Winner of the Interdisciplinary Contest in Modeling (ICM), 2016 (top 5%)
- Silver Medal of the Intel International Science and Engineering Fair (ISEF), 2012 (the historical award of the Chinese Delegation)

PUBLICATIONS

- **Hang Gao**, Xiangyu Xu, et al. "*ER: Early Recognition of Inattentive Driving Events Leveraging Audio Devices on Smartphones"*. INFOCOM. 2017. accepted. (SCI)
- **Hang Gao**, Feng Qiu, Yang Nan. *"Distribution Modeling for Smart City's Taxi Resources Allocation"*. Chinese Journal of Engineering Mathematics. 2016 annual. 57 - 64. awarded "the Best Undergraduate Essay of the Year". (EI)
- **Hang Gao**, et al. *"Channel Allocation Reasoning for Multi-transceiver Wireless Mesh Networks"*. Journal of Hunan University of Science and Engineering. 2016. Vol (3). 103 - 113. (EI)
- Xie Ji, **Hang Gao**, Xinquan Zhao. *"Dynamic Modeling for Chinese Choicest Currency Interest Rate"*. Chinese Journal of Chongqing University. 2016. Vol (2), 60 - 66. (EI)

RESEARCH EXPERIENCES

Context-aware Programming of IoT Infrastructure | CMU | Summer Intern *Jun 2016 - Sept 2016*
Advisor: Anind K. Dey, professor and director of Human-Computer Interaction Institute, CMU

- Implemented LSTM deep learning model on temporal serial vehicular dataset with unsupervised LSTM encoder to automatically label new data input; ultimate accuracy of over 96% on average.
- Abstracted LSTM modeling code as a library called "EasyLSTM" to be incorporated into future IoT analysis infrastructure.
- Programed a dashboard-alike application for context-aware interference with the edge-cutting sensors; optimized overall management by setting up a cloud platform using Google's APIs.

Early Recognition of Inattentive Driving | SJTU | Independent Researcher *Aug 2015 - Jun 2016*
Advisor: Minglu Li, professor and vice dean of Department of Computer Science, SEIEE, SJTU

- Put forward a fine-grained and low-cost activity identification system based on sound signal only.
- Leveraged Doppler spectrum analysis to process raw audio input and Deep Belief Network model to conduct semi-supervised learning task; proposed early recognition system with ultimate accuracy of 94% and less than half of traditional gesturing segment time.
- Firstly proposed the combination way of Deep Belief Network and early recognition for pragmatic usage.

Smart City Taxi Resource Allocation | SJTU | Research Team Leader *Aug 2015 - Nov 2015*
Advisor: Xiaotie Deng, professor of Department of Computer Science, SEIEE, SJTU

- Conducted the big-data analysis and distributed learning to find regression model of multivariate programming.

- Leveraged smart city theory to optimize the model before training the system by ANN.
- Provided a comprehensive derivation of the dynamics between demand and supply of taxi in Shanghai by analyzing real-time statistics and optimized internet-plus company's policy of bidirectional subsidy for drivers and passengers.

PROJECT EXPERIENCES

- **LSNM, a systematic command line tool based on LSM in Linux kernel** *Oct 2016 - Nov 2016*
  A command-line tool of personal firewall based on Linux Security modules (LSM); Cross-platform Implementation between C and Python; realized customized rule for filtering local networking behaviors; hooked embedded functions in root mode of kernel.
- **BeeksBeacon, a context-aware admin dashboard of nearby beacons** *Jul 2016 - Sept 2016*
  An IoT framework done in Ubicomp Lab, HCII, CMU, as pioneering project to extend existing sensor allocation; Cross-platform Implementation between Android, systematic Java and PHP; realtime management of local beacons in admin mode, with automatic update on the Google Cloud.
- **EasyLSTM, a library of LSTM for handy temporal signal processing** *Jun 2016 - Aug 2016*
  An abstracted framework done in Ubicomp Lab, HCII, CMU, for swifter development on temporal sensor signal processing; Python Implementation; provided basic training module, testing module, along with advanced visualization module and smoothing module beforehand.
- **ER, an app to avoid inattentive driving with early warning** *Jan 2016 - May 2016*
  The demo of the paper: *"ER: Early Recognition of Inattentive Driving Events Leveraging Audio Devices on Smartphones";* system and app design on Android platform; synthesized multi-sensors on smartphone, the optimization of Doppler & FFT algorithm; semi-supervised learning though Deep Belief Network.
- **Scheme-Interpreter based on R5RS standard for Python** *Apr 2015 - Jul 2015*
  Inspired by DFA-based text processor; C++ implementation; over 5000 pageviews on "SJTU self-motivated project exhibition" website.
- **Text Processor based on DFA algorithm** *Mar 2015 - Apr 2015*
  Course Project of "Compile Principles"; a simple text processor built by Flex; provided simple text processing function such as autocompletion and jump-in between files; DFA algorithm realization.
- **Gene Analyzer of submergence tolerant factors in general rice types** *Sept 2011 - Apr 2012*
  Extra-curriculum Project awarded silver medal on ISEF'12; the very first trying in C implementation; parse biotic informations abstracted from electronic swimming then leveraged Independent Component Analysis algorithm to rank the most influential gene for submergence tolerance in rice;

SKILLS

Programming: C, C++, C#, Python (over 30k lines of code), Java, Swift, SQL, HTML, Javascript, Matlab, Octave, Scala, LabVIEW, Verilog, $LaTeX$.

Applied Machine Learning / Deep Learning: traditional classifications, early recognitions, and distributed generative models.

App Development: iOS & Android platform, web applications, systematic kernel modules in Linux.