

# Jianmo Ni

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## Education

- Ph.D. University of California San Diego, U.S.A Expected 2021  
Major: Computer Science
- M.E. Shanghai Jiao Tong University, P.R.China March 2016  
Major: Electrical Engineering (GPA 3.9/4.0)
- M.E. Waseda University, Japan September 2014  
Major: Information, Production and Systems Engineering (GPA 3.9/4.0)
- B.S. Shanghai Jiao Tong University, P.R.China July 2013  
Major: Electrical Engineering (GPA 3.7/4.0)

## Research Interest

My research focus on optimization methodologies and machine learning algorithms related with energy-efficient computing in computer systems, Internet of Things and Smart grid.

## Research Experiences

### *University of California San Diego, System Energy Efficiency Lab*

**Advisor:** Prof. Tajana Rosing September 2016-present

#### **Context-aware engine for IoT Applications**

- Developed a context-aware engine by leveraging various kind of context data collected from IoT systems (eg. smart cities, smart grid).
- Accomodated machine learning algorithms (eg. regression, clustering, anomaly detection) to pre-process and analyze large scale data.

### *Shanghai Jiao Tong University, Smart Grid Research Center*

**Advisor:** Prof. Qian Ai October 2014-October 2015

#### **Multiple Micro-Grids Energy Management System**

- Developed the energy management system (Java) for a distribution network containing multiple micro-grids, decide dispatch strategies for the distributed energy resources in the system.
- Implemented optimization algorithms (linear/non-linear programming and game theory) to reduce system cost, maintain the stability of the micro-grids system
- Designed economic transaction scheme by taking advantage of direct trading of micro-grids.

## *Waseda University, VLSI Design Optimization Lab*

**Advisor:** Prof. Takeshi Yoshimura

April 2013-August 2014

### **Function Unit and Register Binding for Interconnection Reduction**

- Reformulated the interconnection reduction problem into a min-cost max-flow by introducing edge-weight function to estimate the interconnection cost.
- Performed simultaneous FU and register binding by finding flow paths and binding FUs and registers on the same path.
- Proposed a primal-dual based method to solve the problem min-cost max-flow problem and improved final result compared with conventional greedy algorithm.

### **Multiple Voltage Scheduling for Power-aware High Level Synthesis**

- Developed a scheduling scheme for multiple voltage scheduling under both timing and resource constraints (benchmark operations are formulated as Directed Acyclic Graph) aiming at minimize power consumption.
- Proposed a coarse-grained tabu search by representing the vector of tabu search as the state of sub-problems which only consider the timing constraint, search from solution space to solution space, effectively avoid from getting into local optimal.
- Introduced heuristic function to estimate the solution of sub-problems, skipped those solution spaces with worse estimation value and therefore accelerating the searching speed.

## Work Experiences

### *Data/Algorithm Engineer Intern, Ping An Insurance Corp.*

Big Data Platform Division

March 2016-August 2016

**Advisor:** Dr. Jing Xiao [Link]

#### **Data Management Platform**

- Established data management platform (Java Play Framework) to support data analysts quick access to back-end databases.
- Implemented data searching via Apache Lucene and Chinese Tokenizer.

#### **Mobile Advertisement Recommendation System**

- Implemented ensemble algorithm (GBDT + Logistic Regression) and achieved 25% CTR increase compared with correlation-based method.

#### **Bank Office Site Recommendation System**

- Designed a generalized linear regression based algorithm to recommend potential bank office site, achieved 10% error on training set.
- Utilized Python Scrapy framework to crawl data from 20+ websites to enlarge input data set for the site recommendation system.

#### **Group Company Customer Profiling**

- Performed customer profiling (3 billion+ users) using both static and dynamic attributes (10 thousand+ dimensions) on big data platform (Hadoop Hive).
- Designed a geocoder tool to transform longitude and latitude information into address to supplement location-based data via Alibaba Map API.

## Publications

### *Journal papers*

- Cong Hao, **Jianmo Ni**, Nan Wang, Takeshi Yoshimura, Interconnection Allocation Between Functional Units and Registers in High-Level Synthesis, IEEE Transactions on Very Large Scale Integration Systems, to be published.
- **Jianmo Ni**, Qian Ai, Economic Power Transaction using Coalitional Game Theory in Microgrids, IET Generation, Transmission & Distribution, 2015.
- Kai Yu, Qian Ai, Shiyi Wang, **Jianmo Ni**, Tianguang Lv, Analysis and Optimization of Droop Controller for Microgrid System Based on Small-Signal Dynamic Model, IEEE Transactions on Smart Grid, 2015.

### *Conference Papers*

- **Jianmo Ni**, Qian Ai, Cong Hao, Nan Wang, Takeshi Yoshimura, A Primal-dual based Method for Interconnection Reduction in FU and Register Binding, IEEE International Conference on ASIC (**ASICON**), Chengdu, China, Nov. 2015.
- Cong Hao, **Jianmo Ni**, Takeshi Yoshimura, Simultaneous Scheduling and Binding for Resource Usage and Interconnect Complexity Reduction in High-Level Synthesis, IEEE International Conference on ASIC (**ASICON**), Chengdu, China, Nov. 2015.
- Cong Hao, Nan Wang, **Jianmo Ni**, Takeshi Yoshimura, An Efficient Tabu Search Methodology for Port Assignment Problem in High-Level Synthesis, International Workshop on Logic & Synthesis (**IWLS**), Mountain View, CA, Jun. 2015.
- **Jianmo Ni**, Nan Wang, Takeshi Yoshimura, Tabu Search based Multiple Voltage Scheduling under both Timing and Resource Constraints, International Symposium on Quality Electronic Design (**ISQED**), Santa Clara, CA, Mar. 2015.

## Honors

- 2016-2019 Focht-Powell Fellowship (Most prestigious fellowship of UC San Diego)
- 2014-2015 National Scholarship, P.R.China (top 2%)
- 2012-2014 Waseda Asia Special Scholarship (Most prestigious fellowship of Waseda University)
- 2011-2012 Shanghai Jiao Tong University Academic Excellence Scholarship (top 10%)

## Skills & Languages

- Languages: Java, C/C++, Python, Hive, SQL, MATLAB
- Platforms: Linux, Hadoop, Spark, Mysql
- Tools: Pandas, scikit-learn, Latex, CPLEX, SVN