

# Sen (Forrest) Yang

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## EDUCATION

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### Rutgers University, the State University of New Jersey

- M.S & Ph.D., in Electrical & Computer Engineering, GPA 3.9/4.0, GRE 1510, TOEFL 103

Piscataway, NJ  
Sept 2013 - Present

### Nanjing University of Posts and Telecommunications, China

- B.A., in Communication Engineering

Nanjing, China  
Sept 2008 – June 2012

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## WORKING EXPERIENCE

### Nokia Bell Labs

- Data Scientist Intern, Machine Learning Group

Murray Hill, NJ  
May 2017 – Aug 2017

### Rutgers University & Children's National Medical Center (CNMC)

- Research Assistant & Data Scientist

Piscataway, NJ & Washington, D.C.  
Aug 2014 - Present

### Huawei Technologies Co. Ltd.

- Software Engineer in GSM, LTE network maintenance

Shenzhen, China  
Aug 2012 – June 2013

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## RESEARCH AND PROJECTS

### 1. Smart Trauma Resuscitation Decision Support System

*NIH Project, Rutgers & CNMC, Aug 2014 - Present*

- During trauma resuscitation, multidisciplinary teams rapidly identify and treat potentially life threatening injuries, then develop and execute a short-term management plan for the identified injuries. To improve medical team performance and reduce the adverse outcomes on the patients, we are developing a computerized decision support system for trauma resuscitations and other fast-paced, high-risk critical care settings. The system monitors workflow and alerts users of errors, allowing remedial actions to be taken to prevent adverse outcomes.
- Developed and repair knowledge-based workflow models using data
- Identified and analyze workflow deviations using process mining techniques
- Developed a real-time computerized decision support system that alerts the of medical team of errors

### 2. Recommender System for Medical Treatment Procedures (VIT-PLA 2.0)

*NIH Project ,Rutgers, Sept 2016 - Present*

- Proposed a novel time-warping-based pairwise process trace similarity measure
- Tested state-of-art clustering algorithms and proposed a novel algorithm for deciding the number of clusters
- Proposed a novel algorithm for calculating process cluster prototype
- Designed a regression model for treatment procedure recommendation

### 3. Workflow Model Mining based on State-Splitting HMM

*NIH Project, Rutgers, Sept 2016 - Present*

- Proposed an alignment-based state-splitting HMM algorithm that can significantly speed up the HMM training process
- The workflow model discovered using our State-Splitting HMM algorithm can handle duplicate activities

### 4. Visual Interactive Tool of Process Log Analysis (VIT-PLA)

*NIH Project, Rutgers, Sept 2015 – Sept 2016*

- Built a framework for clustering process traces, finding cluster prototype using trace alignment, and visualizing the results.
- Discovered associations between process clusters and process context attributes using multinomial logistic regression
- Acquired knowledge from cluster prototypes and regression results

### 5. Sudoku Solver (Java, Java Swing)

*Course Project, Rutgers, Sept 2014 – Dec 2014*

- A Java-app to solve Sudoku with backtracking, simulated annealing, dancing links, and a novel algorithm.

### 6. NBA Game Winner Prediction (Python, SQL)

*Course Project, Rutgers, Jan 2014 – May 2014*

- Crawled ESPN website for game and player data for each game
- Predicted the winner of each NBA game using different classifiers

### 7. Web Development for Stock Forecast (PHP, JS, HTML, CSS)

*Course Project, Rutgers, Jan 2014 – May 2014*

- Collected historical stock data from Yahoo finance
- Predicted stock prices using HMMs, Curve Fitting, and ARMA models

### 8. Health Monitoring Analytics based on Twitter (Android, Java, MongoDB)

*Course Project, Rutgers, Sept 2013 – Dec 2013*

- Queried tweets that correlated to health and fitness using Twitter APIs
- Visualized data analytics in an Android app

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## RECENT PUBLICATIONS

### 1. A Data-driven Process Recommender Framework

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- Sen Yang**, Xin Dong, Leilei Sun, Yichen Zhou, Richard A. Farneth, Hui Xiong, Randall S. Burd and Ivan Marsic  
Accepted by 2017 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2017) 2017 Accepted
- 2. Intention-based Process Recommender System: An Application in Trauma Resuscitation**  
**Sen Yang**, Xin Dong, Weiqing Ni, Shuhong Chen, Richard A. Farneth, Randall S. Burd and Ivan Marsic  
Will submit to IEEE International Conference on Data Mining 2017 In progress
- 3. Automatic Workflow Capture and Analysis for Improving Trauma Resuscitation Outcomes**  
**Sen Yang**  
Doctoral Consortium in 2016 IEEE International Conference on Health Informatics (ICHI 2016) 2016 Published
- 4. VIT-PLA: Visual Interactive Tool for Process Log Analysis**  
**Sen Yang**, Xin Dong, Moliang Zhou, Shuhong Chen, Ivan Marsic, and Randall S. Burd  
KDD 2016 Workshop on Interactive Data Exploration and Analytics (IDEA 2016) 2016 Published
- 5. Duration-Aware Alignment of Process Traces.**  
**Sen Yang**, Moliang Zhou, Rachel Webman, JaeWon Yang, Aleksandra Sarcevic, Ivan Marsic, and Randall S. Burd  
Industrial Conference on Data Mining. Springer International Publishing, 2016 2016 Published
- 6. Medical Workflow Modeling Using Alignment-Guided State-Splitting HMM**  
**Sen Yang**, Moliang Zhou, Shuhong Chen, Omar Ahmad, Ivan Marsic, and Randall S. Burd  
Submitted to IEEE International Conference on Healthcare Informatics (ICHI 2017) 2017 Submitted
- 7. Deviation Analysis of the Pediatric Trauma Resuscitation Process**  
**Sen Yang**, Richard A. Farneth, Rachel Webman, Shuhong Chen, Moliang Zhou, Omar Ahmed, Aleksandra Sarcevic, Ivan Marsic, and Randall S. Burd  
Will submit to Journal of Biomedical Informatics, Elsevier In progress

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#### DATA VISUALIZATION AND ANALYSIS TOOLS (DEVELOPED AND LEAD BY ME)

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- VIT-PLA 2.0**  
• Web-App (<http://34.198.151.101/test.html>, prototype for testing purposes) Developed in 2017
- Visual Interactive Tool of Process Log Analysis (VIT-PLA)**  
• JAVA-App (<https://forrestyang119.github.io/>) Developed in 2016

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#### RESEARCH INTERESTS

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- Data Mining and Knowledge Discovery, Algorithms, Process Mining, Software Engineering in Data Visual Analytics, Deep Learning in Big Data Analytics. (Special focus: Temporal Event Sequences, Process Logs, Workflow Data, Streaming Data)

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#### RELATED COURSES

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- Machine Learning, Data Mining, Data Structures & Algorithms, Data Analytics, Software Engineering, Web App Design, Mobile App Design, Computer Architecture, Linear Algebra, Regression Models (Coursera)

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#### TECHNICAL STRENGTHS (SORTED BY PROFICIENCY)

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<b>Programming Languages</b>	Java, Matlab, R, Python, JavaScript, Android, Java Swing, C++/C, PHP, JSP, HTML, CSS
<b>Database Systems</b>	MySQL, Oracle SQL Database, Mongo DB, AWS Cloud SQL, Google Cloud SQL
<b>Data Mining Skills</b>	Data Analysis, Data Visualization, Machine Learning, Deep Learning Process Mining, Web Crawling
<b>Distributed Computing</b>	Hadoop, Spark 2.0
<b>Operating Systems</b>	Win 10, MacOS Sierra, Ubuntu 16
<b>Enterprise Tools</b>	Office (skilled at macros), Eclipse, Pycharm, Matlab, Netbeans, RStudio, Visual Studio, Latex

#### ADVISORS

Ivan Marsic ([www.ece.rutgers.edu/~marsic/](http://www.ece.rutgers.edu/~marsic/))  
Hui Xiong (<http://datamining.rutgers.edu/>)

#### Mentoring Experience

Bowen Pan (graduate student, Software Engineer at ALK)  
Jiaqi Guo (graduate student, Software Engineer at Amazon)  
Gang Yang (graduate student, Software Engineer at Epic)  
Stephen Hoeffner (undergraduate student)  
Moliang Zhou (graduate student, PhD candidate at Rutgers)  
Mehul Salhotra (undergraduate student, Analyst at Goldman Sachs)  
Linan Meng (graduate student, Software Engineer at (Amazon (China)))

Jingsong Yuan (graduate student, Software Engineer at Amazon)  
Aditya Shukla (graduate student, Software Engineer at Hitachi Data Systems)  
Shuhong Chen (undergraduate student, currently at Rutgers)  
Shuyu Lyv (graduate student, Software Engineer at Amazon)  
Yichen Zhou (graduate student, Software Engineer at Amazon)  
Xin Dong (graduate student, currently at Rutgers)  
Shun Ge (graduate student, currently at Rutgers)  
Shubhank Varshney (graduate student, currently at Rutgers)  
Haiyue Ma (graduate student, currently at Rutgers)  
Shiyu Xu (graduate student, currently at Rutgers)  
Jingyuan Li (graduate student, currently at Rutgers)  
Vancha Verma (undergraduate student, currently at Rutgers)

There are several new students who will join my research team in summer 2017. They are:

Qiyang Wang (1<sup>st</sup> year master student at ECE Rutgers)  
Weiqing Ni (1<sup>st</sup> year master student at ECE Rutgers)  
Yusong wang (1<sup>st</sup> year master student at ECE Rutgers)  
Dawei Wang (1<sup>st</sup> year master student at ECE Rutgers)  
Yifeng Guo (1<sup>st</sup> year master student at ECE Rutgers)  
Xiaoyi Tang (1<sup>st</sup> year master student at ECE Rutgers)  
Himabindu Paruchuri (Undergraduate student at ECE Rutgers)  
Yanhao Wang (1<sup>st</sup> year master student at CS Rutgers)