

## CUI, LiYing (Olivia)

(814) 441-3913(Mobile), (814) 865-7859(LISQ Lab)

128 South Barnard Street, State College, PA 16801

cui.liying@gmail.com, <http://www.personal.psu.edu/luc5>

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Proven innovative scientist and educator, skilled operations analyst and motivated project manager with five-year experience with industry and seven-year research experience with academia in modeling, computing and analytics

### INTERESTS

Service Computing, Business Analytics, Complex Networks, Optimization, Revenue Management, and Supply Chain.

### EDUCATION

- **Ph.D. candidate, Industrial Engineering and Operations Research**, Penn State, Aug.2007-present (defense passed on Dec 15, 2010)  
Dissertation: “Mathematical theory of service composition and service networks”
- **M.S., Operations Science and Control**, Tianjin University, China, Sep.2002-Mar. 2005  
Dissertation: “Data envelopment analysis in anti-HIV immunotherapy”
- **B.S., Mathematics**, Tianjin University, China, Sep.1997-Jul. 2001  
Dissertation: “Revenue management and control of fishery”

### WORK EXPERIENCES

- **Operations and Analytics Intern/Co-OP**, Kimberly-Clark Corporation, Jun. 2009-Nov. 2010  
Invented a set of business intelligence tools on demand forecasting, promotion recommendation, shelf-layout and pricing that could increase 7.5 million of working capital annually for the group  
Worked on the following research efforts
  - Demand forecasting
  - Recommendations on Promotions activities
  - Shelf-layout
  - Pricing
  - Product portfolio optimization
  - PoS(Point of Sales) portfolio optimization
  - Web-based user Interface with Google Map applications
- **Research Assistant**, Laboratory for Intelligent Systems and Quality, Industrial Engineering Dept., The Pennsylvania State University, Jan.2009-present  
Worked on the following research efforts
  - Web Service Discovery and Composition
  - Consumer goods portfolio recommendation based on forecasting
  - Maintenance scheduling based on the integration of manufacturing and after-sale service
  - Hotel management and scheduling
  - Cyber Security
  - ID Fraud Detection

Published three journal papers, and gave six presentations on service composition, revenue management and marketing intelligence. Invented the concept of CyGene. Tutor two master students in their own thesis topics in Terrorist monetary network and Data mining in supply chain.
- **Research Assistant**, Electrical Engineering Department, The Pennsylvania State University, Feb. 2007-May 2008

Coordinated group work, and generated auto-meshing for large scale antenna array that cannot be achieved in GID

- Auto meshing algorithm for computational electromagnetism(EM)
- Developed Auto meshing program which was parallelized to support multiple computing nodes for a CFDTD software package “GEMS” from a contracted company, using C++.

- **Teaching Assistant**, Math department of Tianjin University, Sep. 2002-Jan. 2005  
Improved skills of communication and instruction
  - TA for the course Advanced Mathematics, undergraduate level
  - Graded the math papers for National Matriculation Test, 2003 and 2004
- **System Analyst**, Crisen Technology Co. Ltd., Mar. 2002-Aug. 2002
  - Analyzed the demands and generated the development plans of the resources management system (PetroRM) for Tianjin Petrochemical Corporation in Sinopec group
  - Analyzed the customer requirements and built the database of the facility management system (PetroFM) using SQL Server for Tianjin Petrochemical Corporation in Sinopec group
  - Generated the static analysis of Xianchuan viaduct of Japan using finite element method using FORTRAN, C++, and Cosmos27, and provided work plan for fixing the damage of fatigue

## INTERNSHIP

- **Operations and Analytics Intern**, Latin American Operations, Kimberly-Clark Corporation, Roswell, GA, USA., Jun-Aug. 2009 and 2010
- **Securities operator trainee**, Ping-An Insurance Co., China, Jul.-Aug. 2001
- **Securities operator**, Tianjin branch of Hainan negotiable securities, China, Aug.-Sep. 2000
- **Summer Statistics intern**, Math department, Tianjin University, China, Jul.-Oct. 2000
- **Summer Computational intern**, designed a micro-software tool for spline interpolation, curve and surface fitting, Math department, Tianjin University, China, Aug. -Sept. 1999

## PUBLICATIONS

### Refereed Journals

1. **Complex Networks: An Engineering View**, IEEE Circuits & Systems, Issue 3, Vol. 10, 2010, pp10-25 (L. Cui, S. Kumara, R. Albert)
2. **DEA-based anti-HIV immunotherapy model**, Progress in Natural Science, Vol.14, No.9, 2004, pp828-832 (F. Bian, L. Cui, L. Lessener)
3. **Scenario Analysis of Web Service Composition based on Multi-Criteria Mathematical Goal Programming**, Service Science, Vol 3, No 3, 2011 (L. Cui, S. Kumara, D. Lee, accepted, 2011)

### Refereed Proceedings

4. **Large-Scale Network Decomposition and Mathematical Programming Based Web Service Composition**, Proceedings of IEEE Conference on Commerce and Enterprise Computing, 2009, pp511-514 (L. Cui, S. Kumara, J. Yoo, F. Cavdur)
5. **A Service based Platform Design Method for Customized Products**, Proceedings of CIRP Integrated Production and Service Systems, 2010, pp3-10 (S.K. Moon, T. W. Simpson, L. Cui, S. R. T. Kumara)
6. **Service Composition based on Dynamic Programming and Concept Service (CS) Network**, Proceedings of IERC 2011, Reno, Nevada, USA, May 21-26, 2011 (L. Cui, S. Kumara, T. Yao)

## Refereed Book Chapter

7. *Internet based Service Networks*, Chapter 8, Vol.2, Handbook of Optimization in Complex Networks, Springer (L. Cui, S. Kumara, R. Albert, under review, 2011)

## Under preparation

8. *Topology Analysis and Planning in Large-scale Service Networks*, to M&SOM, May., 2011
9. *Real Time Service Composition based on Dynamic Programming and Concept Service (CS) Network*, March, 2011
10. *The Oracle of Digital Artifacts: Heredity and Provenance*, to Nature, May., 2011 (L. Cui, S. Kumara)
11. *The Net of Things*, March, 2011 (L. Cui, S. Kumara)
12. *Service Computing: Composition Algorithms*, June, 2011
13. *Network Science in Retailing Intelligence*, May, 2012
14. *Quantitative aspects of social networks* (L. Cui and S. Kumara), Handbook of Statistics; Vol. 31, Machine Learning, Elsevier Publishers (V. Govindaraju, and C.R. Rao: eds.), Targeted for 2012.

## PRESENTATIONS

1. *Binary Code heredity and provenance based on Gene detection and Network Science*, NetSci conference, Boston, MA, USA, May 12-14, 2010. (Refereed)
2. *Large-scale service composition based on networks*, INFORMS annual conference, Austin, USA, Nov.7-11, 2010. (Invited)
3. *Binary code provenance and heredity detection modeling and error analysis*, INFORMS annual conference, Austin, USA, Nov.7-11, 2010. (Invited)
4. *Service Composition Based on Networks and Mathematical Programming*, Invited paper, INFORMS annual meeting, San Diego, CA, USA, Oct 10-14, 2009. (Invited)
5. *MCMP Model for Flexible Hotel Cleaning Scheduling*, Contributed paper, INFORMS annual meeting, San Diego, CA, USA, Oct 10-14, 2009. (Contributed)
6. *Service Networks and Service Computing*, OR590 colloquium, Industrial Engineering Dept., The Pennsylvania State University, Sept 7, 2010. (Contributed)
7. *Demand Forecasting and Network based Sales Data Analytics*, Kimberly Clark LAO Graduation Day, Aug 21, Roswell, GA, USA, 2009. (Selected)
8. *Marketing intelligence and POS analysis*, Kimberly Clark LAO Graduation Day, Aug 12-13, Roswell, GA, USA, 2010. (Selected & Competition)
1. *Service Networks Mining and Computing*, Network Science Seminar, Physics Dept. Pennsylvania State University, Jan. 18, 2011 (Contributed)

## COMPUTER SKILLS

- Certified Administrator of **Linux**, Certified Administrator of **AIX V4.3**
- Experienced in **Python, JAVA, FORTRAN, C/C++, XML** and **SQL**
- Good at **MATLAB, Mathematica, AutoCAD, Cosmos27, PhotoShop, Lotus Notes, AUTOMOD, Minitab, LINDO, GAMS** and **C-PLEX solver**
- Experienced in database of **My SQL**, Certified database administrator of **DB2**
- Professional in many mathematical and optimization algorithms; and able to develop, modify, improve and parallelize **large scale computational algorithms** according the properties of the algorithms, the purpose and the environmental constraints of real applications. (Participated the development of high performance computing software package “GEMS.”)
- Experienced in **Google Map and Visualization applications**.

## SERVICE

- **Session Co-Chair**, Complex Information Networks, IERC 2011, Reno, Nevada, USA, May 21-26, 2011.
- **Web Designer/Technique Support**, The first International Crowd Sourcing Workshop, at the Ubiquitous Computing Conference, Copenhagen, Denmark, Sept. 2010 (service provided from USA)
- **Session Co-Chair**, Modeling and Analysis of Real-World Large Scale Networks, INFORMS annual conference, Austin, TX, USA, Nov.7-10, 2010.
- **Group Coordinator and Computer Programmer**, Designed the Auto mesh algorithm for CFDTD software package using C++, Electromagnetic Communication Lab, The Pennsylvania State University, Feb. 2005- May 2005, and May. 2006- Jan. 2007
- **Tutor**, English as the Second Language, Mid-State Literacy Council, State College, PA, USA., 2006-2007
- **Vice President**, Student's science and technology association, Tianjin University, China, 1999-2000
- **Head**, R&D department, Student's science and technology association, Tianjin University, China, 1998-1999
- **Vice President**, Math 97 student Association, Tianjin University, China, 1997-1998
- **Office Manager**, Qichuang Science&Technology Ltd.,Co., Tianjin, China, Jan. 2003-Oct. 2004
  - Operated the office of 8 people, negotiated new location of the business, led business culture and made operating policies
  - The company developed the national Changjiang Scholar application system, and Management of Information System for Ministry of Education of China. It closed in Oct. 2004, due to the reason that all the four co-founders left Tianjin city to pursue Ph.D. study and other career.

## SOCIETIES

IEEE, INFORMS, ALPHA PI MU

## AWARDS

- **Bronze medal**, "Hope Cup" National Mathematics Competition, at the 10<sup>th</sup> grade, China, 1995.
- **Distinguished Student Leader**, School of Science, Tianjin University, 1999.
- **Distinguished Student**, School of Science, Tianjin University, 2004.
- **Kimberly Clark LAO Excellence Award**, 2010, <http://live.psu.edu/story/47989>
- **INFORMS Service Science Finalist Best Paper Award**, Nov.7, 2010