

## Buhwan Jeong

Post-Doctoral Researcher  
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### Personal Information

- Citizenship: Republic of Korea (ROK)
- Resident of: South Korea
- Birth date: April 9, 1977
- Gender: Male
- Marital Status: Unmarried

### Education

- **Doctor of Philosophy (Ph.D.)**, August 2006, Industrial and Management Engineering, Pohang University of Science and Technology (POSTECH), South Korea, GPA: 4.0/4.3, Dissertation: Machine Learning-based Semantic Similarity Measures to Assist Discovery and Reuse of Data Exchange XML Schemas (*Advised by* Dr. Hyunbo Cho)
- **Master of Science (MS)**, February 2002, Industrial Engineering, POSTECH, GPA: 3.51/4.3 Thesis: A Framework of Process Automation for the Efficient Development of Shop Floor Control Systems (SFCs) (*Advised by* Dr. Hyunbo Cho)
- **Bachelor of Science (BS)**, February 2000, Industrial Engineering, POSTECH, GPA: 3.55/4.3 (Magna cum laude)

### Professional Experience

- 2008.03 ~ present: Data Mining Team, Daum Communications Corp., Jeju, South Korea
- 2006.09 ~ 2009.02: Post-Doctoral Researcher, POSTECH Information Research Laboratories (PIRL), Pohang, South Korea
- 2003.07 ~ 2005.01: Guest Researcher, National Institute of Standards and Technology (NIST), Gaithersburg, MD
- 2002.06 ~ 2002.08: Guest Researcher, NIST, Gaithersburg, MD
- 2000.03 ~ 2006.08: Teaching and Research Assistant, POSTECH, Pohang, South Korea
- 1999.07 ~ 1999.08: Summer Internship, POSCO, Pohang, South Korea
- 1997.09 ~ 2000.02: IT Assistance and Web Master, Department of Industrial Engineering, POSTECH, Pohang, South Korea

### Areas of Research Interest and Specialty

- **B2B and SOA**: Data-centric/Service-oriented integration, interoperability and testing, web service discovery and composition, service registry, service validation, supply chain integration
- **Web/XML data mining**: Similarity metrics for XML documents, semantic web, schema/ontology matching, XML content mining
- **Data mining**: Semi-/un-/supervised learning, collaborative filtering (recommender system), machine learning and graphical model, kernel methods, bio-/chem-informatics, text/web/XML data mining
- **Internet of Future**: Collective intelligence, Long Tail marketing, social networking, Web X.0, open innovation, emerging technology
- Non-research interests: Creativity, design, presentation, technology ecosystem

## **Skill and Language**

- **Computer skill** (Programming, tools, and algorithms)
  - ▶ Programming ability in Java (with eclipse), C, Matlab, VBA, SAS, DBMS/SQL (Oracle, MySQL), web programmings (HTML, XML/XSLT, JSP, Servlet, Apache Tomcat, Perl), etc
  - ▶ Office/Authoring tools in Apple iWorks, MS Office, LaTeX, Photoshop, etc
  - ▶ Modeling tools in XML/RDF/OWL/XSLT, JESS, Schematron, IDEF, UML, FSM and Petri net, Rationale Rose, etc
  - ▶ e-Business related technologies in XML, ebXML, BPEL, WSDL, UDDI, SOAP, etc
  - ▶ Data mining and machine learnings, such as artificial neural network (ANN), partial least squares (PLS), support vector machine (SVM), kernel methods, principal component analysis (PCA), stochastic process (e.g., Markov model), genetic algorithm, model predictive control (MPC), clustering, semi-supervised learning, variable/feature selection, collaborative filtering, etc
  - ▶ Text mining, such as vector space model (VSM), latent semantic analysis/indexing (LSA/I), kernel methods for structured data (e.g., string kernel), natural language processing (NLP, i.e., term semantic similarity), etc
  - ▶ Quality engineering, such as design of experiment (DOE) and ANOVA, quality function deployment (QFD), robust design, six sigma, statistical quality control (SQC), etc
- **Language**
  - ▶ Korean (Native)
  - ▶ English (Intermediate both in verbal and in written English)

## **Publications and Presentations**

- **In Preparation**
  - ▶ Improving Memory-based Collaborative Filtering via Similarity Update and Prediction Modulation, Targeted to Information Science
  - ▶ Collaboration Framework between Design and Manufacturing in a Distributed and Uncertain Environment (with J. Joo)
  - ▶ An Evolutionary Optimization Approach to Large-Scale Transductive Support Vector Machines (TSVM)
  - ▶ Novel Kernel Methods to Exploit Semantics of XML Documents
  - ▶ Petri Net-based Validation for Integrity and Quality of Services Composition (with T. Yoo)
  - ▶ Clustering XML Documents using HMM-based Structural Similarity Measure
  - ▶ Graphical Interpretation of Collaborative Filtering: A Preference Propagation Algorithm (with K. Jung)
  - ▶ A Robust Collaborative Filtering Algorithm based on Co-Clustering (with K. Jung)
  - ▶ Market Segmentation through Preference Propagation (with K. Jung)
  - ▶ Incremental Similarity Computation for Large Scale Data
- **Journal Papers**
  1. **Buhwan Jeong** , J. Lee, and H. Cho, User Credit-based Collaborative Filtering, *Submitted* to Expert Systems with Applications, 2008
  2. **Buhwan Jeong** , J. Lee, and H. Cho, An Iterative Semi-Explicit Rating Method for Building Collaborative Recommender Systems, *Submitted* to Expert Systems with Applications, 2008
  3. **Buhwan Jeong** , H. Cho, and C. Lee, Building Functional Classification Schemes for the Effective Registration and Retrieval of Web Services and Information Content, *Submitted* to Information Systems, 2008
  4. **Buhwan Jeong** and H. Cho, On the Functional Quality of Service (FQoS) to Discover and Compose Interoperable Web Services, *Submitted* to Expert Systems with Applications, 2007

5. **Buhwan Jeong**, J. Woo, B. Kulvatunyou, C. Lee, and H. Cho, Agile Test Framework for Diverse B2B Integration Specifications and Software Solutions, *Submitted* to International Journal of Electronic Commerce (IJEC), 2007
6. J. Joo, **Buhwan Jeong**, and J. Ko, Using Web Service Technologies to Automate Design and Manufacturing Collaboration (Manuscript in Korean), *Accepted* by Journal of the Korean Institute of Industrial Engineers, 2007
7. **Buhwan Jeong**, J. Woo, B. Kulvatunyou, and H. Cho, JESS-based Web Interface for XML Document Validation, *Accepted* by Expert Systems with Applications (39(1)) (Submitted in 2007, Corresponding author) (DOI: 10.1016/j.eswa.2007.10.018))
8. **Buhwan Jeong**, D. Lee, J. Lee, and H. Cho, Support for Seamless Data Exchanges between Web Services through Information Mapping Analysis using Kernel Methods, *Accepted* by Expert Systems with Applications (38(4)) (Submitted in 2007) (DOI: 10.1016/j.eswa.2007.10.021)
9. J. Jang, **Buhwan Jeong**, B. Kulvatunyou, J. Chang, and H. Cho, Discovering and Integrating Distributed Manufacturing Services with Semantic Manufacturing Capability Profiles, *Accepted* by International Journal of Computer Integrated Manufacturing (Submitted in 2006, Corresponding author)
10. **Buhwan Jeong**, D. Lee, H. Cho, and J. Lee, A Novel Method for Measuring Semantic Similarity for XML Schema Matching, Expert Systems with Applications, 34(3), 1651-1658, April 2008
11. **Buhwan Jeong**, D. Lee, H. Cho, and B. Kulvatunyou, A Kernel Method for Measuring Structural Similarity between XML Documents, New Trends in Applied Artificial Intelligence (H.G. Okuno and M. Ali Eds), Lecture Notes in Artificial Intelligence (LNAI) 4570, pp. 572-581, 2007 (IEA/AIE 2007)
12. **Buhwan Jeong** and H. Cho, Feature Selection Techniques and Comparative Studies for Large-Scale Manufacturing Processes, International Journal of Advanced Manufacturing Technology, 28(9), 1006-1011, 2006
13. **Buhwan Jeong**, J. Lee, and H. Cho, Efficient Optimization of Process Parameters in Shadow Mask Manufacturing using NNPLS and Genetic Algorithm, International Journal of Production Research, 43(15), 3209-3230, 2005

• **Conference Papers**

1. **Buhwan Jeong**, H. Cho, B. Kulvatunyou, and A. Jones, A Multi-Criteria Web Services Composition Problem, Proceedings of the 2007 IEEE International Conference on Information Reuse and Integration, Las Vegas, NV, August 2007
2. **Buhwan Jeong**, D. Lee, H. Cho, and B. Kulvatunyou, A Kernel Method for Measuring Structural Similarity between XML Documents, To appear in the 20th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE-2007), Kyoto, Japan, June 2007
3. **Buhwan Jeong**, H. Cho, T. Yoo, and J. Chang, An Intelligent Test Methodology to Achieve Interoperability between Business-to-Business (B2B) Applications, Proceedings of the 3rd International Conference of Interoperability for Enterprise Software and Applications (I-ESA'07), Madeira Island, Portugal, March 2007 (Nominated to Best Paper Award)
4. **Buhwan Jeong**, T. Yoo, J. Woo, and H. Cho, A Petri-Net-based Semantic Validity Model for Services Composition, The E2ESU Scientific Foundations Workshop, Gaithersburg, MD, March 2007
5. **Buhwan Jeong**, D. Lee, J. Lee, and H. Cho, Towards XML Mining: The Role of Kernel Methods, Proceedings of the 2006 Fall Data Mining Conference, Seoul, South Korea, November 2006 (**SAS Excellent Student Paper Award**)
6. J. Jang, **Buhwan Jeong**, H. Cho, and J. Lee, Capability and Extension of UDDI Framework for Semantic Enterprise Integration, Proceedings of International Conference on Advances in Production Management Systems, Washington DC, September 2005
7. **Buhwan Jeong**, B. Kulvatunyou, N. Ivezic, H. Cho, and A. Jones, Enhance Reuse of Standard e-Business XML Schema Documents, Proceedings of International Workshops on

- Contexts and Ontology: Theory, Practice and Applications (C&O'05) in the 20th National Conference on Artificial Intelligence (AAAI'05), Pittsburgh, PA, July 2005
8. N. Ivezic, B. Kulvatunyou, A. Jones, S. Frechette, H. Cho, and **Buhwan Jeong**, An Interoperability Testing Study: Automotive Inventory Visibility and Interoperability, 14th e-Challenge Conference, Vienna, Austria, pp. 551-558, October 2004
  9. B. Kulvatunyou, K.C. Morris, **Buhwan Jeong**, and P. Goyal, Development Life Cycle and Tools for XML Content Models, XML Conference 2004, Washington DC, November 2004
  10. B. Kulvatunyou, N. Ivezic, and **Buhwan Jeong**, Testing Requirements to Manage Data Exchange Specifications in Enterprise Integration - A Schema Design Quality Focus, In Proceedings of the 8th World Multi-Conference on Systemics, Cybernetics, and Informatics (SCI 2004), Orlando, FL, July 2004
  11. S. Kim, J. Woo, S. Park, **Buhwan Jeong**, and H. Cho, Integrated Development of Nonlinear Process Planning and Simulation Based Shop Floor Control, Proceedings of the Winter Simulation Conference, San Diego, CA, December 2002
  12. **Buhwan Jeong**, S. Kim, S. Gong, and H. Cho, Design and Development of Process Execution Software for Processes Specified with the PSL Ontology, Proceedings of the 2002 Fall KIIE Conference, Suwon, Korea, October. 2002
  13. **Buhwan Jeong**, H. Hwang, and H. Cho, System Architecture for On-line Quality Assurance, Proceedings of the 7th KIPE Conference, Pohang, Korea, October 2002
  14. J. Shin, S. Park, **Buhwan Jeong**, and H. Cho, An Investigation of the Influence of Alternative Process Plans in a Dynamic Shop Floor Environment, Proceedings of the INFORMS International Meeting, Maui, HI, June 2001
  15. S. Park, J., **Buhwan Jeong**, and H. Cho, Kernel-based Open Architecture for Developing Equipment Controllers in Distributed Shop Floor Control, Proceedings of the 27th International Conference on Computers & Industrial Engineering, Beijing, China, October 2000

• **Presentations and Invited Talks**

1. **Buhwan Jeong**, The Long Tail and Data Mining (Job Seminar), SERI, Seoul, South Korea, November 9, 2007
2. **Buhwan Jeong**, Profile requirements for web services, KATS, Seoul, South Korea, September 11, 2007
3. **Buhwan Jeong**, Multi-Criteria Service Composition: High Functionality and High Quality, IEEE IRI 2007, Las Vegas, NV, August 15, 2007
4. **Buhwan Jeong**, A Kernel-based Structural Similarity between XML Documents, IEA/AIE 2007 (Kyoto University), Kyoto, Japan, June 27, 2007
5. **Buhwan Jeong**, A Proof-of-Concept Interoperability Gateway System for GM Container Management, POSTECH, Pohang, South Korea, May 29, 2007
6. **Buhwan Jeong**, Test Assertions Guideline, KIEC, Seoul, South Korea, May 4, 2007
7. **Buhwan Jeong**, H. Cho, T. Yoo, and J. Chang, A Mediatory Approach to B2B Interoperability Testing, The 3rd International Conference of Interoperability for Enterprise Software and Applications (I-ESA'07), Madeira Island, Portugal, March 26-30, 2007
8. **Buhwan Jeong**, T. Yoo, J. Woo, and H. Cho, Verifying Service Composition using Formal Approaches (A Petri Net-based Semantic Validity Model for Services Composition), FP7 ENSURE Consortium Meeting (Scientific & Technical Foundation Discussion), NIST, Gaithersburg, MD, March 22-23, 2007
9. **Buhwan Jeong** and H. Cho, Differentiating Service Utility from Private Business Sector Services: A Salesforce.com Case, FP7 E2ESU Consortium Meeting, UNINOVA, Lisbon, Portugal, February 15-16, 2007
10. **Buhwan Jeong**, Web Intelligence: Kernel Meets XML, Data Mining Conference, Seoul, Korea, November 11, 2006
11. **Buhwan Jeong**, J. Woo, and H. Cho, Interoperability Activities in Korea: Status and Vision, OAG Technical Meeting, San Francisco, CA, November 2, 2005

12. D. Kim, J. Jang, **Buhwan Jeong**, and H. Cho, Business Document Schema Validation, The 2nd International Interoperability Conference, KIEC, Seoul, South Korea, October 11, 2005
13. **Buhwan Jeong**, T. Yoo, and J. Kim, The Next Interoperability in KorBIT, KorBIT Meeting, ATS, Seoul, South Korea, May 20, 2005
14. B. Kulvatunyou, N. Ivezic, and **Buhwan Jeong**, Testing Requirements to Manage Data Exchange Specifications in Enterprise Integration - A Schema Design Quality Focus, SCI 2004, Orlando, FL, July 2004
15. N. Ivezic, B. Kulvatunyou, N. Anicic, **Buhwan Jeong**, J. Woo, J. Kim, J. Lee, J. Jang, and H. Cho, NIST Testbed, Korean Testbed, and European Interoperability Update, OAG Technical Meeting, Gaithersburg, MD, April 27-29, 2004
16. N. Ivezic, B. Kulvatunyou, **Buhwan Jeong**, S. Frechette, and A. Jones, OAG/NIST B2B Testbed Overview, OAG Technical Meeting with ETeB Delegation, San Francisco, CA, November 24, 2003
17. **Buhwan Jeong**, B2B Interoperability Testing: Overview, IIC and Applications, KIEC, Seoul, South Korea, May 30, 2003
18. **Buhwan Jeong** and H. Hwang, B2B/A2A Testbed, KIEC, Seoul, South Korea, February, 2003
19. **Buhwan Jeong** and H. Cho, Introduction to Business Process Executor in ebXML BPSS, ATS, Seoul, South Korea, November 2002
20. **Buhwan Jeong**, S. Kim, S. Gong, and H. Cho, Design and Development of Process Execution Software for Processes Specified with the PSL Ontology, Fall KIIE Conference, Suwon, South Korea, October 10, 2002
21. J. Shin, S. Park, **Buhwan Jeong**, and H. Cho, An Investigation of the Influence of Alternative Process Plans in a Dynamic Shop Floor Environment, INFORMS International Meeting, Maui, Hawaii, June 19, 2001

### **Selected Projects**

- 2002.12 ~ present: Korea B2B/A2A Interoperability Testbed (KorBIT), KATS & KIEC, South Korea  
Sub-projects include KorBIT testbed for ebXML-compliant solutions, TAG, ebXML/Web service profile, QoD/SDC testbed, *de facto* standardization for testing multimedia data, etc
- 2006.01 ~ 2006.08: Variation Analysis for Moving Parts in Automobile, HMC, South Korea
- 2003.07 ~ 2005.01: Inventory Visibility & Interoperability, NIST & AIAG, United States
- 2000.01 ~ 2003.01: Process Information System (Manufacturing Process Optimization), LG Micron, South Korea
- 2000.01 ~ 2000.09: Simulation-based Steel-making Process Scheduling Tool, POSCO, South Korea
- 2000.01 ~ 2000.02: Six Sigma, POSCO, South Korea