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# Lucio Soibelman

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## Professional Interests

Use of information technology for economic development. Information technology support for construction management. Process integration during the development of large-scale engineering systems. Information Logistics. Artificial Intelligence, Data Mining, Knowledge Discovery, Image Reasoning, Text Mining, Machine Learning, Multi-reasoning Mechanisms, sensors, sensor networks, and advanced infrastructure systems

## Education

June 1998 Massachusetts Institute of Technology Cambridge, MA

### **Ph.D. in Civil Engineering Systems**

- **Dissertation Title:** The Exploration of Meta-Representation for the Conceptual Phase of Structural Design for Tall Buildings through Distributed Multi-Reasoning Algorithms.

This dissertation deals with the development of a model that aim to assist engineers in the conceptual phase of the structural design of tall buildings by providing him/her with organized and reliable information. This preliminary conceptual design involves selecting preliminary materials, selecting the overall structural form of the building, producing a rough dimensional layout, and considering technological possibilities. Decisions are made on the basis of such information as height of the building, building use, typical live load, wind velocity, earthquake loading, design fundamental period, design acceleration, maximum lateral deflection, spans, story height, and other client's requirements. The model objective is to provide designers with adapted past design solutions with the help of a distributed multi-reasoning mechanism creating a support system to enhance creativity, engineering knowledge and experience of designers. To prove the feasibility of the proposed model I developed a distributed artificial intelligence computer system that works as a decision support tool for the preliminary design of tall buildings structures. This system applies an agent like approach developing competence modules, which is an expert at a particular small task oriented competence. The Internet is being used as a communication backbone among the different systems that implement the reasoning mechanisms being employed. The current implementation was developed with three modules: The classification module implemented by a C4.5 agent, the past cases/experience module implemented by a Case Based Reasoning agent, and the adaptation module implemented by the Genetic Algorithm agent.

August, 1993 Universidade Federal do RGS Porto Alegre, Brazil

### **Master of Science in Civil Engineering**

- **Thesis Title:** Material Waste in the Construction Industry: Incidence and Control.

February, 1991 Japan International Cooperation Agency Tokyo, Japan  
**Specialist in Advanced Construction Technology**

January, 1984 Universidade Federal do RGS Porto Alegre, Brazil  
**Bachelor of Science in Civil Engineering**

**Academic  
Experience**

2008-2009 Carnegie Mellon University Pittsburgh, PA  
12-671: Special Topics: Fundamental Concepts of Computing in Civil  
and Environmental Engineering –Teacher

- The purpose of this course is to introduce students to the important concepts of computing related to civil and environmental engineering. The course will briefly describe the form and operation of modern computational devices, the data structures and algorithms that are used in many of the computations that support CEE software applications, and explore the frontier of applying advanced computing in civil and environmental engineering.

2007-2011 Carnegie Mellon University Pittsburgh, PA  
12-610: Special Topics: ICCM International Collaborative Construction  
Management –Teacher

- This course is intended to provide a comprehensive overview of the life cycle of the facility development process and of relevant project management techniques. While primary emphasis is on the construction phase, the techniques and perspective apply to the other phases of the facility development process as well. Students learn not only how to develop construction estimates and schedules, but also, globalization issues, methods to work on multicultural teams, negotiation techniques, and methods to improve international collaboration enhanced by the use of Information Technology. Students work in international teams to collaborate from remote locations (USA, Turkey, Brazil, and Israel) via the Internet taking maximum advantage of information technology. Students also report on lessons learned on working with different cultures.

2005-2010 Carnegie Mellon University Pittsburgh, PA  
12-741: Data Management –Teacher

- This is a class where the students are introduced to the basics of databases and database management systems as applied to engineering problems in general and civil engineering problems in specific and to data mining concepts and techniques and knowledge discovery in databases principles applied to engineering problems/data in general and civil engineering problems/data in specific. Students learn how to extract patterns representing knowledge implicitly stored in large civil engineering databases or other massive information repositories. The course lectures emphasizes on issues relating to the feasibility, usefulness, efficiency and scalability of techniques for the discovery of patterns hidden in engineering databases.

2006 Carnegie Mellon University Pittsburgh, PA

12-705: Advanced Techniques for Project Management – Teacher

- This class is intended to provide a sampling of advanced techniques, concepts and research topics in project management. The course focus is a systems view of construction and its interactions with related activities. The course is taught as a tutorial, with presentations by speakers and discussion classes led by students. Students have to research one or two topics of their choice, and give presentations and do a final presentation and a report. This format has the objective of enhancing the participants' ability to research, organize, and communicate advanced material.

2006 – 2008 and 2010 Carnegie Mellon University Pittsburgh, PA

12-744: AIS Systems Project Preparation Course – Teacher

- The intent of this course is (1) to prepare students for the project course 12-745 by exposing them to the following topics: technical communication; team-based problem solving, negotiation, and collaboration support technologies; individual and team ethics; library skills; readings/discussions relevant to the domain of project topic intended for 12-745 and (2) to design, estimate, plan, and specify the project that will be executed during the project course 12-745.

2006 - 2010 Carnegie Mellon University Pittsburgh, PA

12-745: AIS Systems Project Course – Teacher

- The iAdvanced Infrastructure Systems (AIS) program has been designed to equip civil engineering students with the skill-set required to approach conventional problems from nontraditional approaches. The focus of the program is on teaching principles of computer science and information technology to allow engineers to efficiently acquire appropriate data and analyze the data to reveal trends and yield knowledge. The AIS Project Course serves as an appropriate culmination of this pedagogical philosophy. A real-world, industry driven problem is provided to students and the requirements are broadly defined. In the first semester of the academic year, students analyze the problem and determine the scope of the project. The design and implementation of the solution is then performed in the second semester of the academic year. The goal of the course is to allow students to practically utilize the skills they have acquired from the instructional courses in the AIS program.

2005 and 2011 Carnegie Mellon University Pittsburgh, PA

12-271: Introduction to Computer Applications in Civil & Environmental Engineering – Teacher

- This class is an introduction to the use of computer-based applications in civil engineering, using generic tools such as spreadsheets, equation solvers and computer graphics. Discussion of the role of computer-based methods in civil engineering practice.

2005 Carnegie Mellon University Pittsburgh, PA

12-742/48-742: Database Concepts in CAE – Teacher

- This is a class where students are introduced to databases and database management systems for Computer Aided Engineering (CAE). Topics include: the relational and object-oriented models; engineering data modeling issues; and the design of engineering data bases. Each student develops a prototype database application of his or her choice.

2005 Carnegie Mellon University Pittsburgh, PA

12-738 Advanced Data Management & Analysis – Teacher

- This is a class where students are introduced to concepts and techniques of data mining learning how to automate the extraction of patterns that represent the knowledge implicitly stored in large databases, data warehouses, and other massive information repositories. The class is a comprehensive introduction to Computer Aided Engineering (CAE) data mining applications.

2001- 2004 University of Illinois at Urbana/Champaign Urbana, IL

CEE498CDP Collaborative Design Processes – Teacher

- This is a capstone design class where students learn methods of collaborative design in the AEC industry enhanced by the use of information technology. Students work in multi-disciplinary teams to collaborate from remote locations (UIUC-Urbana and UF-Gainesville) via the Internet on the design of a facility. Team members from structural engineering, architecture and construction management generate designs while experimenting with different work practices to take maximum advantage of information technology using commercially available software. Students also develop process designs for the integration of technology into the work of multi-disciplinary design teams.

2000- 2004 University of Illinois at Urbana/Champaign Urbana, IL

CEE495 Civil and Environmental Engineering Seminar – Construction Management – Teacher

- This class is a research seminar class with guest speakers and graduate students' presentations.

1999- 2004 University of Illinois at Urbana/Champaign Urbana, IL

CEE498AID Artificial Intelligence in Design – Teacher

- This class is an introduction to the design theory and to Artificial Intelligence applications in design. It introduces AI, Distributed AI, Machine Learning, Neural Networks, Decision Trees, Case Based Reasoning, Genetic Algorithms, and Data Mining

1998 – 2003 University of Illinois at Urbana/Champaign Urbana, IL

CEE318 Construction Cost Analysis and Estimates – Teacher

- This class is an introduction to the application of scientific principles to costs and estimates of costs in construction engineering; concepts and statistical measurements of the factors involved in direct costs, general overhead costs, cost markups and profits; and the fundamentals of cost recording for construction cost accounts and cost controls.

2001-2003 Universidade Federal do Rio Grande do Sul POA, Brazil  
New Information Technology Support for Construction Management – Teacher

- This class is a graduate one week 15 hours course offered once a year. It presents new information technology tools developed and being developed to support construction management. It introduces modeling, 4DCAD, data acquisition, sensors, laser scanners, wireless computing, data mining, knowledge generation, and simulation.

1996 - 1998 Massachusetts Institute of Technology Cambridge, MA

1.432J Project Control - Teacher Assistant

- Lectured recitations for a graduate level project control course. This class looks at project control as the art and science of directing and coordinating human, equipment, material and financial resources through the life of a project, using modern management techniques and information technology systems to achieve predetermined objectives of scope, quality, budget, and schedule within the context of the natural, social and political environment in which the project is being developed. Supervised several group design projects, created the course package, and created and graded the problem sets

1994 - 1995 Massachusetts Institute of Technology Cambridge, MA

1.12 Computer Models of Physical and Engineering Systems - Teacher Assistant

- Lectured recitations for an undergraduate level modeling and programming course. This class adopted a top-down approach to study modeling: from conceptualization of the overall model to implementation of the model in C++. Supervised several group design projects, created the course package, and created and graded the problem sets

January, 1996 Massachusetts Institute of Technology Cambridge, MA

Instructor of the IAP Course Introduction to C++

July-August, 1995 Escuela Politecnica del Ejercito Quito, Ecuador

Teacher of the Course Strategic Planning for Construction Companies

July-August, 1994 Universidade Federal do RGS Porto Alegre, Brazil  
Teacher of the Course Strategic Planning in Construction

**Professional  
Experience**

2010 – GAFISA São Paulo, Brazil  
Consultant

2010 – Louis Berger Group Inc Washington, DC  
Consultant

2000 – 2002 Patrick Engineering Chicago, IL  
Consultant

2000 – 2001 PiniWeb São Paulo, Brazil  
Consultant

1991 - 1993 L.Soibelman Engenharia e Fundações Porto Alegre, Brazil  
Owner and President

1992 - 1993 Condomínio Edifício Guaporé Porto Alegre, Brazil  
Project Manager

1986 - 1991 Sigma Ensaios Tecnológicos Porto Alegre, Brazil  
Chief Technology Officer

1985 - 1986 Condomínio Edifício Minerva Porto Alegre, Brazil  
Project Manager

1983 - 1985 Chão e Teto Colocadora de Revestim. Porto Alegre, Brazil  
Owner and President

1981 - 1993 Mosaico Empreendimentos Imob. Porto Alegre, Brazil  
Trainee

1980 - 1981 Estaqueamento Gaúcho Ltda. Porto Alegre, Brazil  
Trainee

**Books and Books  
Chapters  
Authored or Co-  
Authored**

Dzombak, D.A., VanBriesen, J.M., Garrett, J.H., Soibelman, L. "Sensing for improved water infrastructure management in 2050," in *Water Resources 2050 Vision*, Walter Grayman, Peter Loucks, and Laurel Saito, Editors, American Society of Civil Engineering, Environmental and Water Resources Institute, Reston, VA, 2010

O'Brien, W. and Soibelman L, "Technology and Engineering Dimensions: Collecting and Interpreting New Information for Civil and Environmental Infrastructure Management" in *Digital Infrastructures Enabling Civil and Environmental Systems Trough Information Technology* edited by Zimmerman and Horan, Routledge – Taylor and Francis, London, UK, 2004

Soibelman, L., and Peña-Mora, F. "Computing in Civil Engineering, *Proceedings of the 2005 ASCE International Conference on Computing in*

*Civil Engineering*”, Editor, ASCE, Reston, VA, 2005

Soibelman, L., and Akinci, B. “Computing in Civil Engineering, Proceedings of the 2007 ASCE International Workshop on Computing in Civil Engineering”, Editor ASCE, Reston, VA, 2007.

**Peer Reviewed  
Articles**

Soibelman, L. and Peña-Mora, F., “A Distributed Multi-Reasoning Mechanism to Support the Conceptual Phase of Structural” *Journal of Structural Engineering*, American Society of Civil Engineers (ASCE) – June, 2000 -Volume 126, Issue 6 pp. 733-74.

Soibelman, L., and Kim, H., “Data Preparation Process for Construction Knowledge Generation through Knowledge Discovery in Databases” *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE), January 2002, Volume 16, Number 1 pp 39-48.

Soibelman, L. Formoso C., DeCesare, C., and Issatto, E., “ Material Waste in the Building Industry: Main Causes and Prevention” *Journal of Construction Engineering and Management*, American Society of Civil Engineers (ASCE), July/August 2002, Volume 128, Number 4 pp 316-325.

Soibelman, L. and Gonzales, M. A. S. "A Knowledge Discovery in Databases Framework to Property Valuation", *Journal of Property Tax Assessment and Administration*, International Property Tax Institute, Volume 7, number 2 2002, pp 77-106.

Soibelman, L, and Caldas, C. and Han, J. “Automated Classification of Construction Project Documents” *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE), October 2002, Volume 16, Number 4 pp 234-243.

Soibelman, L. and Peña-Mora, F., “The Multi-Reason Artificial Mind (M-RAM) Project - A Model and a System Prototype to Support the Conceptual Phase of Structural Design for Tall Buildings Through Distributed Multi-Reasoning Algorithms,” *International Journal of IT in Architecture, Engineering, and Construction (IT-AEC)* Millpress Science Publishers, January 2003, pp 27-42.

Caldas, C. and Soibelman, L. "Automating Hierarchical Document Classification for Construction Management Information Systems", *Automation in Construction*, Elsevier Science, volume 12, number 4, July 2003, pp 395-406.

Soibelman, L., Liu, L. Y., Kirby, J. G., East, E. W. Caldas, C. H., and Lin, K. Y. "Design Review Checking System (DrChecks)/Corporate Lessons Learned (CLL)" *Journal of Construction Engineering and Management*, American Society of Civil Engineers (ASCE), September/October 2003, pp 475-484.

Soibelman, L., and O'Brien, W. and Elvin, G. "Collaborative Design Processes: An Active and Reflective Learning Course in Multidisciplinary Collaboration" *Journal of Construction Education*, Associated Schools of Construction (ASC), summer 2003, Vol. 8, No. 2, pp 78-93.

Caldas C, Soibelman, L., and Gasser, L. "A Methodology for the Integration of Project Documents in Model-Based Information Systems" *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE), Jan 2005, Volume 19, Number 1, pp 25-33.

Soibelman, L, and Kim, H., "Knowledge Discovery for Project Delay Analysis" *Bauingenieur*, Springer VDI Verlag, February 2005.

Brilakis, I., and Soibelman, L., "Content-Based Search Engines for Construction Images Databases" *Automation in Construction*, Elsevier Science, Volume 14, Issue 4, August 2005, Pages 537-550.

Soibelman, L., Gonzalez, M.A.S., and Formoso, C.T. "A New Approach to Spatial Analysis in CAMA" *Journal of Property Management*, Emerald, Volume 23 Issue 5, 2005, Pages 312-327

Brilakis, I., Soibelman, L. and Shinagawa, Y. (2005) "Material-Based Construction Site Image Retrieval" *Journal of Computing in Civil Engineering*, American Society of Civil Engineers, Volume 19, Issue 4, October 2005, Pages 341 – 355

Soibelman, L, NG, H, and Toukourou, A. "Knowledge Discovery in a Facility Condition Assessment Database Using Text Clustering" *Journal of Infrastructure Systems*, American Society of Civil Engineers (ASCE), Volume 12, Issue 1, March 2006, Pages 50-59

Lin, K. Y., and Soibelman L., "Promoting Transactions for A/E/C Product Information" *Automation in Construction*, Elsevier Science, Volume 15, Issue 6 , November 2006, Pages 746-757

Brilakis, I. and Soibelman, L. "Multi-Modal Image Retrieval from Construction Databases and Model-Based Systems", *Journal of Construction Engineering and Management*, American Society of Civil Engineers, Volume 132, Issue 7, July 2006, Pages 777 – 785

Brilakis, I., Soibelman, L., and Shinagawa, Y. "Construction Site Image Retrieval Based on Material Cluster Recognition", *Journal of Advanced Engineering Informatics*, Elsevier Science, Volume 20, Issue 4, October 2006, Pages 443-452

Soibelman, L., Wu, J., Caldas, C., Brilakis, I. and Lin, K.Y. "Data Analysis on Complicated Construction Data Sources: Vision, Research, and Recent Developments", Revised selected paper from keynote article at the 13th EG-ICE Workshop on Intelligent Computing in Engineering & Architecture, *Lecture Notes in Artificial Intelligence Journal*, Springer, Volume 4200, October 2006, Pages 637 - 652

Lin, K. Y., and Soibelman, L., "Knowledge Assisted Retrieval of Online Product Information in A/E/C" *Journal of Construction and Engineering Management*, American Society of Civil Engineers (ASCE), November 2007, 133(11), pp. 871-879.

Brilakis, I., and Soibelman, L., "Shape-Based Retrieval of Construction Site Photographs" *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE), Volume 22, Issue 1,

January/February 2008, Pages 14-20.

Soibelman, L., Wu, J., Caldas, C. Brilakis, I, and Lin, K.Y., "Management and Analysis of Unstructured Construction Data Types", *Journal of Advanced Engineering Informatics*, Elsevier Science, 22 (1), p.15-27, Jan 2008.

Kim, H., Soibelman, L., and Grobler. F., "Factor Selection for Construction Delay Analysis Using Knowledge Discovery in Databases", *Automation in Construction*, Elsevier Science, 17 (5), p.550-560, Jul 2008.

Guo, W., Soibelman, L., and Garrett, J.H., "Imagery Enhancement and Interpretation for Remote Visual Inspection of Aging Civil Infrastructure" *Journal of Tsinghua University-Science and Technology*, Volume 13, Supplement 1, Oct 2008, Pages 375-380

Berges, M., Goldman, E., Mathews, H.S., and Soibelman, L., "raining Load Monitoring Algorithms on Highly Sub-Metered Home Electricity Consumption Data", " *Journal of Tsinghua University-Science and Technology* Volume 13, Supplement 1, Oct 2008, Pages 406-411

Guo, W., Soibelman, L., and Garrett, J.H., "Automated Defect Detection for Sewer Inspection and Condition Assessment", *Automation in Construction*, Elsevier Science, Volume 18, May 2009, Pages 587-596

Guo, W., Soibelman, L., and Garrett, J.H., "Visual Pattern Recognition Supporting Defect Reporting and Condition Assessment of Wastewater Collection Systems", *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE), Volume 33, Number 3, May/June 2009, Pages 160-169

Lin, K. Y., and Soibelman, L., "Incorporating Domain Knowledge and Information Retrieval Techniques to Develop an Architectural/Engineering/Construction (A/E/C) Online Product Search Engine" *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE) Vol. 23, No. 4, July/August 2009, pp. 201-210.

Shih, C.Y., Scown, C., Soibelman, L., Matthews, H.S., Garrett, J.H., Dodrill, K., McSurdy, S., "Data Management for Geospatial Vulnerability Assessment of Interdependencies in US Power Generation ", *Journal of Infrastructure Systems*, American Society of Civil Engineers (ASCE), Vol. 15, No. 3, September 2009, pp.179-189.

Pena-Moura, F., Chen, A.Y., Aziz, Z., Soibelman, L., Liu, L.Y., El-Rayes, K., Arboleda, C.A., Lantz Jt, T.S., Plans, A.P., Lakhera, S., and Mathur, S., "Mobile Ad Hoc Network-Enabled Collaboration Framework Supporting Civil Engineering Emergency Response Operations", *Journal of Computing in Civil Engineering*, American Society of Civil Engineers (ASCE), Vol. 24, No. 3, May/June 2010, pp. 302-312.

Soibelman, L., Sacks, R., Akinci, B., Dikmen, I., Birgonul, M.T., and Eybpoosh, M., "Preparing Civil Engineers for International Collaboration in Construction Management", *Journal of Professional Issues in Engineering education and Practice*", American Society of Civil

Engineers (ASCE), in Print.

Berges, Mario, Ethan Goldman, H. Scott Matthews, Lucio Soibelman. "Enhancing Electricity Audits in Residential Buildings with Non-Intrusive Load Monitoring". *Journal of Industrial Ecology: Special Issue on Environmental Applications of Information and Communication Technologies (ICT)*., vol. 14, no. 5, pp. 844-858, October, 2010.

Oliveira, D. P. d., Neill, D. B., Jr., J. H. G., and Soibelman, L., "Detection of patterns in water distribution pipe breakage using spatial scan statistics for point events in a physical network." *Journal of Computing in Civil Engineering*, Vol. 25, No. 1, January/February 2011, pp. 21-30, 2011.

Berges, Mario, Ethan Goldman, Lucio Soibelman, H. Scott Matthews, Kyle Anderson. "User-centric Non-Intrusive Electricity Load Monitoring for Residential Buildings". *ASCE Journal of Computing in Civil Engineering* (In print).

Taneja, Saurabh, Burcu Akinci, James H. Garrett, Lucio Soibelman, Mario Berges, Guzide Atasoy, Xuesong Liu, Mohsen Shahandashti, E. B. Anil, Esin Ergen, Anu Pradhan. "CEC: Sensing and Field Data Capture for Construction and Facility Operations". *ASCE Journal of Construction Engineering and Management* (in print)

Shahandashti, Mohsen, Saledeh N. Razavi, Lucio Soibelman, Mario Berges, Carlos H. Caldas, Ioannis Brilakis, Jochen Teizer, Patricio A. Vela, Carl Haas, James H. Garrett Jr., Burcu Akinci, Zhenhua Zhu. "CEC: Data Fusion Approaches and Applications for Construction Engineering". *ASCE Journal of construction Engineering and Management* (in print).

Rowe, A., Berges, M., Bhatia, G., Goldman, E., Rajkumar, R., Soibelman, L., Garrett, J.H., Moura, J.M.F., "Sensor Andrew: Large-Scale Campus-Wide Sensing and Actuation." *IBM Journal of Research and Development: Special Issue on Smarter Cities and Sensed Infrastructures*, Vol 55, Issue 1-2, January 2011.

Oliveira, D. P. d., Jr., J. H. G., and Soibelman, L., "Detection of clustering patterns in networked infrastructure failures using density data clustering: an application to water distribution pipe breakage." *Paper submitted to the ASCE Journal of Computing in Civil Engineering* (in print).

Taneja, S., Akcamete, A., Akinci, B., Garrett, J. H., Jr., Soibelman, L., East, E. W. "Analysis of Three Indoor Localization Technologies for Supporting Operations and Maintenance Field Tasks", *ASCE Journal of Computing in Civil Engineering* (in print).

**Articles in  
Conference  
Proceedings**

Taneja, S., B. Akinci, J.H. Garrett, Jr., E.W. East and L. Soibelman, (2011). "Transforming an IFC-based Building Layout Information into a Geometric Network Model for Indoor Navigation Assistance," ASCE Workshop on Computing in Civil Engineering, Miami, US, 19-22 June, 2011

Ying, Y., Harley, J., Garrett Jr., J. H., Jin, Y., Oppenheim, I. J., Shi, J., and Soibelman, L, "Applications of Machine Learning in Pipeline Monitoring", ASCE Workshop on Computing in Civil Engineering, Miami, US, 19-22 June, 2011

Jin, Yuanwei, Eniye Tebekaemi, Mario Berges, Lucio Soibelman. "Robust Adaptive Event Detection in Non-Intrusive Load Monitoring for Energy Aware Smart Facilities". *International Conference on Acoustic, Speech and Signal Processing (ICASP 2011)*, Prague, Czech Republic.

Berges, Mario, H. Scott Matthews, Lucio Soibelman. "A System for disaggregating Residential Electricity Consumption by Appliance". *The IEEE International Symposium on Sustainable Systems and Technology (ISSST) 2010*, Washington, DC, May 17-19, 2010.

Ying, Y., Soibelman, L., Harley, J., O'Donoghue, N., Garrett Jr., J. H., Jin, Y., Moura, J. M. F., and Oppenheim, I. J., "A Data Mining Framework for Pipeline Monitoring Using Time Reversal", *Proceedings of 2010 Society for Industrial and Applied Mathematics (SIAM) Conference on Data Mining -Workshop on Data Mining for Smarter Infrastructure*, Columbus, OH, May 2010. (Invited paper)

Ying, Y., Harley, J., Garrett Jr., J. H., Jin, Y., Moura, J. M. F., O'Donoghue, N., Oppenheim, I. J., and Soibelman, L., "Time Reversal for Damage Detection in Pipes", *Proceedings of 2010 SPIE Smart Structures/NDE Conference*, Vol. 7647, San Diego, CA, March 7-11, 2010, pp. 76473S.1-12.

Ying, Y., Oppenheim, I. J., Garrett Jr., J. H., Greve, D. W., and Soibelman, L., "Oblique Excitation of Nearly-Longitudinal Waves in Thick Plates", *Proceedings of 2010 SPIE Smart Structures/NDE Conference*, Vol. 7647, San Diego, CA, March 7-11, 2010, pp. 76474L.1-11.

Jin., Y., O'Donoghue, N., Moura, J. M. F., Harley, J., Garrett Jr., J. H., Oppenheim, I. J., Soibelman, L., and Ying, Y., "Cognitive sensor network for structure defect monitoring and classification using guided wave signals", *Proceedings of 2010 SPIE Smart Structures/NDE Conference*, Vol. 7647, San Diego, CA, March 7-11, 2010, pp. 76473T.1-12.

Taneja, S., B. Akinci, J.H. Garrett, Jr., E.W. East and L. Soibelman, (2010). "Evaluation of Localization Algorithms for WLAN-based Tracking to Support Facility Management Field Activities," Proceedings of CIB W-78 Applications of IT in the AEC industry, Cairo, Egypt, 16-18 November, 2010 (Best student paper)

Berges, Mario, Lucio Soibelman, H. Scott Matthews. "Leveraging Data From Environmental Sensors to Enhance Electrical Load Disaggregation Algorithms". 13th International Conference on Computing in Civil and Building Engineering, Nottingham, UK, June 30-July 2, 2010.

Berges, Mario, Lucio Soibelman, H. Scott Matthews. "Building Commissioning as an Opportunity for Training Non-Intrusive Load Monitoring Algorithms", 16th International Conference on Innovation in Architecture, Engineering and Construction (AEC), State College, PA, June 9-11, 2010.

Berges, Mario, Lucio Soibelman, H. Scott Matthews, Ethan Goldman. "Evaluating the electric consumption of residential buildings: current practices and future prospects". ASCE Construction Research Congress 2010, Banff, Alberta, May 8-10, 2010.

Taneja, S., Akcamete, A., Akinci, B., Garrett, J. H., Jr., Soibelman, L., "Analysis of Three Indoor Localization Technologies to Support Facility Management Field Activities", 13th International Conference on Computing in Civil and Building Engineering, Nottingham, UK, June 30-July 2, 2010.

O'Donoghue, Nicholas; Harley, J; Moura, J.M.F.; Jin, Y.; Oppenheim, I.; Ying, Y.; States, J.; Garrett, J.; Soibelman, L. "Single-Antenna Time Reversal of Guided Waves in Pipes", in *Proc. of 157th Meeting on Acoustics*, Portland, OR, May 2009. (best student paper).

O'Donoghue, Nicholas; Harley, J; Moura, J.M.F.; Jin, Y.; Oppenheim, I.; Ying, Y.; States, J.; Garrett, J.; Soibelman, L., "Focusing of Ultrasonic Waves in Cylindrical Shells using Time Reversal", in Proc. 8th Int'l Workshop on Structural Health Monitoring (IWSHM 09), Stanford, CA, Sept 2009.

Rowe, Anthony, Mario Berges, Gaurav Bhatia, Ethan Goldman, Raj Rajkumar, Lucio Soibelman. "Sensor Andrew: Large-Scale Campus-Wide Sensing". Information Processing in Sensor Networks 2009.

Oliveira, D. P. de, L. Soibelman, and Garrett Jr., J. H. "Exploratory Spatial Data Analysis (ESDA) of Drinking Water Pipe Break Events: an Overview." 2009 NSF Engineering Research and Innovation Conference. Honolulu, Hawaii, June 2009.

Agrawal, A., Harley, J., Ying, Y., Garrett Jr., J.H., Sohn, H., and Soibelman, L. "Preliminary studies on the dispersion of signals produced by permanently installed MFC transducers for pipeline monitoring", European Group for Intelligent Computing in Engineering EG-ICE 16th Conference Berlin 15th – 17th July 2009 in Berlin, Germany.

Oliveira, D., Jr., J. H. G., and Soibelman, L. "Spatial clustering analysis of water main break events (Accepted)." ASCE International Workshop on Computing in Civil Engineering, Austin, Texas, 2009.

Berges, Mario, Ethan Goldman, H. Scott Matthews, and Lucio Soibelman. "Learning Systems for Electric Consumption of Buildings". ASCE International Workshop on Computing in Civil Engineering, Austin, Texas, 2009.

Soibelman, L., Akinci, B., Sacks, R., Dikmen, I., Birgonul, M.T., Formoso, C., and Isatto E., "Teaching Globalization Issues to Civil

Engineering Students – The International Collaborative Construction Management Course”, 5<sup>th</sup> International Conference on Construction in the 21<sup>st</sup> Century – CITC-V, May 20-22, Istanbul, Turkey, 2009.

Guo, W., Soibelman, L. and J. H. Garrett, Jr., "Automated Defect Recognition in Urban Wastewater Pipes using Invariant Features Found in Video Images", Construction Research Congress (CRC) Conference on Building a Sustainable Future, April 5-7, 2009, Seattle, WA, USA

Quinones P. A., Fussel, S.R., Soibelman, L., and Akinci, B., "Bridging the Gap: Discovering Mental Models in Globally Collaborative Contexts", IWIC 09 February 20-21, Palo Alto, CA, USA, 2009

Soibelman, L., Akinci, B., Ozcan, G., Dikmen, I, Birgonul, T. (2008) "International Collaborative Construction Management Course: A Teaching Case Study." *5th International Conference on Innovation in Architecture, Engineering and Construction 2008*, June 25-28, 2008, Antalya, Turkey

Guo, W., Garrett J.H., Oliveira,D., and Soibelman L., "Integrating Traditional Inspection Data and New Technologies for Automated/Improved Condition Assessment for Sewer Maintenance", Intelligent Computing in Engineering (ICE08), 2 – 4 July 2008, Plymouth, UK.

Mathews, H.S., and Soibelman, L., Berges, M., and Goldman, E., "Automatically Disaggregating the Total Electrical Load in Residential Buildings: A Profile of the Required Solution", Intelligent Computing in Engineering (ICE08), 2 – 4 July 2008, Plymouth, UK.

Oliveira, D., Soibelman, L, and Garrett, J.H., GIS applications for Spatial Analysis Breakage Data Water Distribution Systems Condition Assessment, ASCE International Pipelines Conference, July 22-27, 2008, Atlanta, GA, USA.

Oliveira, D., Guo, W., Soibelman, L, and Garrett, J.H., "Data Management and Analysis for Sewer Systems Operations and Maintenance". 1<sup>st</sup> No-Dig 2008 – Latin American Edition and 3<sup>rd</sup> Brazilian Congress on Trenchless Technology, Feb 13 -15, 2008, Sao Paulo, Brazil.

Soibelman, L, and Garrett, J. H., "Sensor Data-Driven Management of Infrastructure Systems", Information Technology in Architecture, Engineering, and Construction Workshop", September 6-7, 2007, Cork, Ireland.

Oliveira, D., Guo, W., Soibelman, L, and Garrett, J.H., "Spatial Data Management and Analysis in Sewer Systems Condition Assessment: an Overview", ASCE 2007 International Workshop on Computing in Civil Engineering, July 24-27, 2007, Pittsburgh, USA.

Guo, W., Soibelman, L, and Garrett, J.H., "Automatic Defect Detection and Recognition for Asset Condition Assessment", ASCE 2007 International Workshop on Computing in Civil Engineering, July 24-27, 2007, Pittsburgh, USA.

Shih, C.Y., Scown, C.D., Soibelman, L., Matthews, H.S., Garrett, J.H., Dodrill, K., and McSurdy, S., "Decision Support Framework for Electricity Production Vulnerability Assessment", ASCE 2007 International Workshop on Computing in Civil Engineering, July 24-27, 2007, Pittsburgh, USA.

Dodrill, K., Garrett, J. H., Matthews, H. S., Shih, C. Y., Soibelman, L., and McSurdy, S. (2007). "Knowledge Management and Visualization in Support of Vulnerability Assessment of Electricity Production." *TRB 86th Annual Meeting*, January, 21-25, 2007, Washington, DC.

Soibelman, L., Wu, J., Caldas, C. Brilakis, I, and Lin, K.Y., "Data Analysis on Complicated Construction Data Sources, Vision, Research, and Recent Developments", 13<sup>th</sup> EG-ICE Workshop 2006, Ascona, Switzerland, June 2006.

Soibelman, L, and Brilakis, I., "Shape Recognition of Linear Construction Entities from Construction Site Images", Joint International Conference on Computing and Decision Making in Civil and Building Engineering, June 14-16 2006, Montreal, Canada.

Soibelman, L, Garret, J., and Shih, C,Y., "Steel Bridge Corrosion Detection by Wavelet Transform Theory", Joint International Conference on Computing and Decision Making in Civil and Building Engineering, June 14-16 2006, Montreal, Canada.

Soibelman, L., and Wu, J., "Advanced Scheduling Data Preparation, Representation, and Analysis in Support of Construction Planning and Scheduling", Joint International Conference on Computing and Decision Making in Civil and Building Engineering, June 14-16 2006, Montreal, Canada.

Soibelman, L., and Caldas, C., "A Combined Text Mining Method to Improve Document Management in Construction Projects", Joint International Conference on Computing and Decision Making in Civil and Building Engineering, June 14-16 2006, Montreal, Canada.

Soibelman, L. Guo, W. and Garrett, J. H. "Automatic Visual Data Interpretation for Pipeline Infrastructure Assessment" International Association for Bridge and Structural Engineering (IABSE) 2006 Symposium - Responding to Tomorrow's Challenges in Structural Engineering, September 13-15, 2006, Budapest, Hungary.

Brilakis, I., and Soibelman., L., "Automated Integration of Construction Images in Model Based Systems", 1<sup>st</sup> International Conference on Construction Engineering and Management, ICCEM 2005, October 16-19, 2005, Seoul, Korea

Soibelman, L. and Brilakis, I., ""Automatic Integration of Construction Images using Digital Imaging and Pattern Recognition Tools" 3<sup>rd</sup> International Conference on Construction in the 21<sup>st</sup> Century – Advancing Engineering, Management and Technology, September 15-17, 2005, Athens, Greece.

Soibelman, L. and Brilakis, I., "Identification of Material from

Construction Site Images Using Content Based Image Retrieval Techniques" ASCE 2005 International Conference on Computing in Civil Engineering, July 12-15, Cancun, Mexico.

Soibelman, L. and Runner, K.Y.L., "Knowledge-Assisted Retrieval of Online Product Information in A/E/C (Architecture/Engineering/Construction)" ASCE 2005 International Conference on Computing in Civil Engineering, July 12-15, Cancun, Mexico.

Soibelman, L. and Garrett, J.H., "Advanced Construction Data Management to Support Proactive Project Control" TIC 2005, April 7-8, 2005, Sao Paulo, SP, Brazil

Soibelman, L. and Brilakis, I., ""Comparison of Manual and User-Guided Methodologies for the Classification and Retrieval of Construction Images" ASCE 2005 Construction Research Congress, April 5-7, 2005, San Diego, CA.

Soibelman, L. and Oliveira Filho, N., ""Sequential Analysis of Reasons of Non-Completion of Activities: Case Study and Future Directions" 12<sup>th</sup> Annual Conference in the International Group of Lean Construction, August 3-5, 2004, Elsinore, Denmark.

Soibelman L, Liu L, and Wu J, "Data Fusion and Modeling for Construction Management Knowledge Discovery" 10<sup>th</sup> International Conference on Computing in Civil and Building Engineering, June 02-04, 2004, Weimar, Germany

Liu L, Soibelman L, and Torsten T, "Technologies for Construction Field Data Collection" 10<sup>th</sup> International Conference on Computing in Civil and Building Engineering, June 02-04, 2004, Weimar, Germany

Soibelman L, O'Brien W, and Elvin G, "Collaborative Design Processes: A Class on Concurrent Collaboration in Multidisciplinary Design" 10<sup>th</sup> International Conference on Computing in Civil and Building Engineering, June 02-04, 2004, Weimar, Germany

Soibelman, L. and NG, H. " Knowledge Discovery in Maintenance Databases Enhancing the Maintainability in Facilities", Construction Research Congress, 19-21 March 2003, Honolulu, Hawaii

Soibelman, L. and Caldas, C. "Integration of Construction Documents in IFC Project Models", Construction Research Congress, 19-21 March 2003, Honolulu, Hawaii

Caldas, C. H. and Soibelman, L. "Implementing Automated Methods for Document Classification in Construction Management Information Systems", ASCE & EG-ICE Workshop, 2-3 November, 2002, Washington, DC

Soibelman L, and Kim, H. ".Knowledge Discovery and Supervised Machine Learning in a Construction Project Database", Data Mining 2002 – Third International Conference on Data Mining and Databases for Engineering, Finance and Other Fields, 25-27 September, 2002, Bologna, Italy.

Gonzales, M.A.S., Soibelman, L., and Formoso C.T. "Explaining Neural Networks in Property Valuation" - 4<sup>th</sup> Simposio Argentino en Inteligencia Artificial (ASAI 2002), Santa Fe, Argentina – 9-13, Sept. 2002.

Caldas, C. and Soibelman, L. "Improving Construction Information Flows with Automated Text Classification Tools", 10<sup>th</sup> Annual Conference for Lean Construction, 6-8 August, 2002, Gramado-RS-Brazil

Soibelman, L., O'Brien, W. and Elvin G. "Encouraging Concurrent Collaboration in Multidisciplinary Design Projects: A Classroom Based Study", Concurrent Engineering in Construction – CECO2" 1-3 July 2002, Berkeley, CA.

Gonzales, M.A.S., Soibelman, L., and Formoso C.T. "A New Approach to Spatial Analysis in CAMA" I - 9<sup>th</sup> European Real Estate Society Conference (ERES2002). Glasgow: ERES, 2002.

Gonzales, M.A.S., Soibelman, L., and Formoso C.T. "Explaining Results in a Neural-Mass Appraisal Model" - 9<sup>th</sup> European Real Estate Society Conference (ERES2002). Glasgow: ERES, 2002.

Soibelman, L., O'Brien, W. and Elvin G. "CDP-Collaborative Design Processes: A Classroom Based Study Serving as a Laboratory for Studying A/E/C Distributed Design" Invitational Workshop on the Role of Empirical Studies in Understanding and Supporting Engineering Design, 4-5 April, 2002, NIST, Gaithersburg, MD.

Soibelman, L. and Caldas, C., "Modeling Information Flows In Construction Inter-Organizational Processes" Special Conference on Fully Integrated and Automated Project Processes in Civil Engineering 23-25 January 2002 - Blacksburg, VA.

Soibelman, L. and Kim, H., "A KDD Framework for Construction Databases" Special Conference on Fully Integrated and Automated Project Processes in Civil Engineering, 23-25 January 2002 - Blacksburg, VA.

Caldas, C. and Soibelman, L., "Avaliação da Logística de Informação em Processos Inter-Organizacionais na Construção Civil" II Simpósio Brasileiro de Gestão da Qualidade e Organização do Trabalho no Ambiente Construído 4 a 6 de setembro de 2001. Fortaleza, CE – Brasil.

Soibelman, L. and Kim, H., "KDD Process Framework for Construction Knowledge Generation", Innovation in AEC Industry, 18-20 July 2001 – Loughborough, UK.

Soibelman, L., and Kim, H., "Generating Construction Knowledge with Knowledge Discovery in Databases" The 8<sup>th</sup> International Conference on Computing in Civil and Building Engineering (VIII-ICCCBE) August 2000, Stanford, CA.

Soibelman, L. and Caldas, C., "Information Logistics for Construction Design

Team Collaboration”, The 8<sup>th</sup> International Conference on Computing in Civil and Building Engineering (VIII-ICCCBE) August, 2000, Stanford, CA

Soibelman, L, and Kim, H., “Generating Knowledge from Large Construction Databases”, International Group for Lean Construction Eighth Annual Conference (IGLC-8), July 2000, Birmingham, UK.

Soibelman, L, and Caldas, C., “Information Logistics Approach for Construction Inter-organizational Information Systems”, Construction Information Technology 2000, CIB W78, IABSE, WC6, EG SEA AI, June 2000, Reykjavik, Iceland

Soibelman, L, and Caldas, C., “Extranets Applications for Project Management: The North American Example”, Antac-2000 May, 2000, Salvador, Brazil 1999

Soibelman, L. “Construction Knowledge Generation and Dissemination”, Berkeley-Stanford CE&M Workshop: Defining a Research Agenda for AEC Process/Product Development in 2000 and Beyond, Stanford, August 1999

Soibelman, L. and Peña-Mora, F., “M-RAM: An Artificial Intelligence Distributed System to Support the Conceptual Phase of Structural Design”, *Civil-Comp99-The Seventh International Conference on Civil and Structural Engineering Computing*, Oxford, England, 13-15 September 1999

Soibelman, L., Peña-Mora, F., “A Geographically Distributed Multi-Reasoning Mechanism for change negotiation Management of Large Scale Engineering Systems”, In Proceedings of the *W78 “Information Technology in Construction” and TG10 “Computer Representation of Design Standards and Building Codes” Workshop: Construction on the Information Highway/BLED/96* - Bled -Slovenia, June, 1996.

Soibelman, L., Formoso, C.T., Franchi, C., “A Study on the Waste of Materials in the Building Industry in Brazil “ In Proceedings of the *First international Conference on Sustainable Construction - CIB - Task Group 16*, Tampa, Florida, USA, November, 1994.

Soibelman, L., Formoso, C.T., Franchi, C., “A Study on the Material Waste in the Construction Industry”, In Proceedings of *ENTAC 93 - Brazilian National Construction Convention*, Sao Paulo, Brazil, November, 1993.

Soibelman, L., Formoso, C.T., Franchi, C., “A Methodology for Controlling Material Waste on Building Sites”, In Proceedings of the *International Symposium on Economic Evaluation and the Built Environment - W55 Symposium*, Lisbon, Portugal, September, 1993.

Soibelman, L., Formoso, C.T., Franchi, C., “Material Loss in the Construction Industry”, In Proceedings of the *II Seminar for Quality in Construction*, Porto Alegre, Brazil, June, 1993.

Soibelman, L., Scommazon, B., Silva, N., “Study of a Method for the Determination of Construction Undertakings Profitability”, In Proceedings

of VIII ENCO - Brazilian National Construction Convention, Goiania, Brazil, May 1986.

Soibelman, L., Scommazon, B., Silva, N., "Apartment Houses for Social Purpose - Alternative Techniques for its Planning, Programming and Control", In Proceedings of VIII ENCO - Brazilian National Construction Convention, Goiania, Brazil, May 1986

## **Bulletins or Reports**

El-Rayes, K. Liu, L., Soibelman, L., and Hyari, K. "*Nighttime Construction: Evaluation of Lighting for Highway Construction*"

Rowe, Anthony, Mario Berges, Gaurav Bhatia, Ethan Goldman, Raj Rajkumar, Lucio Soibelman, James Garrett, José M. F. Moura. "Sensor Andrew: Large-Scale Campus-Wide Sensing". CMU Internal Technical Report, 2008

*Operations in Illinois*". (Final Report). Project VD-H1, FY 00/01, Illinois Transportation Research Center, Illinois Department of Transportation, August 2003.

El-Rayes, K. Liu, L., Soibelman, L., and Hyari, K. "*Recommendations for Lighting Arrangements: Evaluation of Lighting for Highway Construction Operations in Illinois*". (4<sup>th</sup> Interim Report). Project VD-H1, FY 00/01, Illinois Transportation Research Center, Illinois Department of Transportation, April 2003.

El-Rayes, K. Liu, L., Soibelman, L., and Hyari, K. "*Development of Design Criteria for Nighttime Construction Lighting*". (3<sup>rd</sup> Interim Report). Project VD-H1, FY 00/01, Illinois Transportation Research Center, Illinois Department of Transportation, November 2002.

El-Rayes, K. Liu, L., Soibelman, L., and Hyari, K. "*Survey Results: Nighttime Construction: Evaluation of Lighting for Highway Construction Operations in Illinois*". (2<sup>nd</sup> Interim Report). Project VD-H1, FY 00/01, Illinois Transportation Research Center, Illinois Department of Transportation, June 2002

El-Rayes, K. Liu, L., Soibelman, L., and Hyari, K. "*Literature Review: Nighttime Construction: Evaluation of Lighting for Highway Construction Operations in Illinois*". (1<sup>st</sup> Interim Report). Project VD-H1, FY 00/01, Illinois Transportation Research Center, Illinois Department of Transportation, December 2001.

Soibelman, L. et. all., "*A Model to Improve Quality Management in Small Construction Companies*", University Press - Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, May, 1993.

Soibelman, L., Formoso, C.T. and Franchi, C., "*Material Loss on Construction Sites*", University Press - Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, May, 1993.

Soibelman, L., Scomazon, B. and Silva, N., "*Methods for Profitability Analysis of Housing Construction Projects*", University Press – Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, June 1987.

Soibelman, L., Scomazon, B. and Silva, N., "*Planning, Programming and*

*Controlling - The Line of Balance Methodology*, University Press - Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, December 1985.

### **Editorials**

Garrett, J.H., Flood, I., Smith, I.F.C., and Soibelman, L., "Information Technology in Civil Engineering-Future Trends", *ASCE Journal of Computing in Civil Engineering*, Vol. 18, No. 3, July 2004, pp. 185-186.

Soibelman, L., and Pena-Mora, F., "Computing in Civil Engineering — Lessons Learned from the 2005 ASCE International Conference on Computing in Civil Engineering", *ASCE Journal of Computing in Civil Engineering*, Vol. 20, No. 4, July/August 2006, pp. 223-224.

Garrett, J.H., and Soibelman, L., "The New Editors and Their Plans for the Journal of Computing in Civil Engineering", *ASCE Journal of Computing in Civil Engineering*, Vol. 22, No. 4, July/August 2008, pp. 231-232.

### **Patents**

Berges, Mario E., Ethan J. Goldman, Lucio Soibelman, Burton W. Andrews, Diego S. Benitez, H. Scott Matthews, and Michael Hoynck, "Methods and Apparatuses for Monitoring Energy Consumption and Related Operations", U.S. Provisional Patent #61/222,247

### **Guest Speaker**

Engineering Sustainability 2011: Innovation and the Triple Bottom Line Engineering Sustainability 2011: Innovation and the Triple Bottom Line, Invited Speaker, "Enabling Energy-Aware Facilities" April 12, 2011, Pittsburgh, PA.

SUNY Global Center – Center for Collaborative Online International Learning (COIL) Conference, Keynote Speaker, "Two Views of Globally Networked Learning at the Graduate Level: Civil Engineering and Doctoral Research", March 31 2011, New York, NY.

SINDUSCON-SP – Seminario BIM – Modelagem da Informacao na Construcao, "BIM Process: Data integration and its benefits compared to traditional processes" December 10, 2010, Sao Paulo, Brazil.

Hong Kong Polytechnic University, "Advanced Infrastructure Systems", November 20, 2009, Hong Kong, China.

No Dig Conference: Trenchless Technologies in Asia Pacific – Hong Kong – 2009 – Keynote Speaker – "Advanced Pipeline

Systems Inspection and Monitoring Developments”, November 19, 2009, Hong Kong, China.

8<sup>th</sup> International Conference on Construction Applications of Virtual Reality - Keynote Speaker – “ Data Management, Visualization, and Knowledge Discovery for Advanced Infrastructure Systems”, October, 20, 2008, Kuala Lumpur, Malaysia

2<sup>nd</sup> National ASBEA Conference – Sao Paulo – Brazil - Keynote Speaker – “Building Information Modeling”, October 10, 2008, Sao Paulo Brazil

Machine Learning/Google Seminar, Carnegie Mellon University, “Data Management and Knowledge Discovery for Advanced Infrastructure Systems”, Jan 28, 2008, Pittsburgh, PA

University College Cork, Ireland, Information Technology in Architecture, engineering, and Construction Workshop, “Sensor Data-Driven Management of Infrastructure Systems”, September 7, 2007, Cork, Ireland.

3 Encontro de Tecnologia de Informacao e Comunicacao na Construcao Civil, “BIM – Presente e Futuro” , Keynote Speaker, July 11, 2007, Porto Alegre, RS, Brazil.

Arup, “Beyond BIM, the future of Advanced Building information Models”, March 27, 2007, New York, NY

ASCE – Northern New Jersey Chapter, “From BIM to Proactive Project Control” , March 27, 2007, Newark, NJ.

85<sup>th</sup> TRB Annual Meeting, Data Stewardship – Meeting the Challenges of Enterprise Data Management Workshop, “Advanced Construction Data Management and Knowledge Discovery”, January 22, 2006, Washington, DC

National Central University, Institute for Construction Engineering and Management, “Advanced Construction Data Management and Knowledge Discovery” October 20, 2005, Jung-li City, Taoyuan, Taiwan

National Taiwan University of Science and Technology, Department of Construction Engineering, “Advanced Construction Data Management and Knowledge Discovery”, October 21, 2005, Taipei, Taiwan

National Taiwan University, Department of Civil Engineering, Division of Construction Engineering and Management, “Advanced Construction Data Management and Knowledge Discovery”, October 21, 2005, Taipei, Taiwan

National Chiao Tung University, “Advanced Construction Data Management and Knowledge Discovery”, October 20, 2005, Hsinchu, Taiwan.

CERIK – Construction & Economy Research Institute of Korea,

“Advanced Construction Data Management and Knowledge Discovery”,  
October 19, 2005, Seoul, Korea.

University of Seoul, School, of Architecture and Architectural  
Engineering, “Advanced Construction Data Management and  
Knowledge Discovery”, October 18, 2005, Seoul, Korea.

The “Contractor and Construction Manager Issues” International  
Superconference, Invited Speaker, “Beyond 4DCAD – Advanced  
Construction Data Management to Support Proactive Project Control  
and Knowledge Discovery” May 20, 2005, London, UK.

TIC2005, Universidade de Sao Paulo (USP), Keynote Speaker,  
“Advanced Construction Data Management to Support Proactive Project  
Control”, April 8, 2005, Sao Paulo, SP, Brazil

University of Rio Grande do Sul, Norie, “Advanced Data Management  
for Construction Management” Porto Alegre, RS, December, 2004

University of Sao Paulo, USP, SP, “KDD, Text Mining, and Image  
Reasoning Research at the CKDD Group,” Brazil, July 2003

Centro de Tecnologia de Edificacoes - CTE, SP – Brazil, “New IT  
support for construction management,” July 2003

IABSE Working Commission 6, Antwerp, Belgium “Data Mining  
Applications in Civil Engineering,” August 2003

University of Texas – Austin – Civil Engineering Department – “UIUC  
Construction Management Program and the CKDD Group”, February  
28, 2003

University of California at Berkeley, Civil and Environmental Engineering  
Department – “The CKDD Group at UIUC, Research and  
Developments”, February 24, 2003

Stanford University, Civil and Environmental Engineering Department –  
“The CKDD Group at UIUC, Research and Developments”, February 21,  
2003

Key speaker for the Seminario Tecnologia da Informacao e  
Comunicacao na Construcao Civil – Programa Construbusiness do  
Estado do Parana – Curitiba – PR – Brazil – November 28, 2002.

UIUC Graduate School of Library and Information Science, “Automated  
Classification and Integration of Text-Based Information in  
Construction”, March 6, 2002

Key speaker for the II Simpósio Brasileiro de Gestão da Qualidade e  
Organização do Trabalho no Ambiente Construído and Sinduscon – CE  
- Fortaleza, CE – Brazil “A/EC Industry and New Information  
Technology Trends”, September 4 and 6, 2001.

Sinduscon – SP – Brazil

“A/EC Industry and New Information Technology Trends”, August 8 2001.

Sinduscon – PR and Universidade Federal do Parana – PR – Brazil  
“A/EC Industry and New Information Technology Trends”, August 9 2001

Sinduscon – RS – Brazil  
“A/EC Industry and New Information Technology Trends”, August 13 2001

PINI – SP - Brazil  
“New IT in Construction Management”, December 14, 2000

Universidade Federal do Rio Grande do Sul – Porto Alegre Brazil –  
“Advanced Construction Management”, December 22, 2000

Virginia Tech – Department of Civil Engineering – Blacksburg – Virginia  
“The KDD Group”, September 28, 2000

The GSLIS-2000 Clinic on ELECTRONIC COMMERCE IN THE INFORMATION INDUSTRIES - Technical Frontiers and Institutional Issues for Information Management Professionals – Urbana – IL - USA  
“Cross-Organizational Information Logistics”, April 2-4, 2000, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, Urbana, USA

7 Simposium Internacional de Ingeniaria Civil ITESM – Monterrey – Mexico  
“Material Waste in the Construction Industry: Incidence and Control”  
Monterrey, March 03, 2000, Monterrey, Mexico

Sinduscon – SP - Brazil  
“Extranets Applications in Project Management”, January 17, 2000, São Paulo, Brazil

## **Grants**

2009 NSF - National Science Foundation - Arlington, VA  
“GOALIE/CPS: Medium: A framework for Enabling Energy-Aware Smart Facilities” \$ 1,484,575

2009 NSF - National Science Foundation - Arlington, VA  
“DynSyst\_Special\_Topics: Temporal coarse-graining of molecular dynamic using the parametrized locally invariant manifolds method and data warehousing techniques” \$ 418,710

2009 NIST – Nat. Inst. of Standards and Technology Gaithersburg, MD  
“Development of a Framework for Evaluating and Fusing Different Data Capture Technologies to Support Continuous Construction Productivity Analyses and Improvement” \$ 250,000

2009 – US Army	Champaign IL
“Requirements for and approaches toward context-aware BIM”	\$182,180
2009 Fundacao de Ciencia e Tecnologia	Lisbon, Portugal
“ICTI-SINAIS – Sustainable Interaction with Social Networks and Context Awareness.”	\$608,677
2009 PITA	Pittsburgh, PA
“A prototypical Interface for Integrated Visualization of Advanced Pipe Inspection Data”	\$88,782
2008 CTC/DOE	Johnstown, PA
“A Theoretical, Numerical, and Experimental Investigation of Guided Wave Propagation in Hollow Cylinders for Application to Structural Health Monitoring”	\$449,367.00
2008 NSF - National Science Foundation -	Arlington, VA
“Development of a spatial analysis framework to predict critical segments of water distribution networks.”	\$268,000.00
2008 IBM	Yorktown Heights, NY
“A Demonstration of Sensor Andrew as a Framework to Support Data Fusion and Integration for Multiple Sensor Platforms using IBM's System-S”	\$40,000.00
2007 PITA	Pittsburgh, PA
“A Demonstration of Sensor Andrew as a Framework to Support Data Fusion and Integration”	\$ 46,605.00
2008 NSF	Arlington, VA
SGER: A Virtual Community of Construction Scholars and Practitioners	\$40,000.00
2007 Bosch Research	Pittsburgh, PA
“Learning Based Systems for Residential Electricity Monitoring”	\$149,638.00
2007 IMTS-NASA	Fairmont, WV
“Computer Vision and Image Reasoning for Automatic Defect Detection: A Case Study on Sewage Pipes Inspection”	\$ 90,000.00
2007 PITA	Pittsburgh, PA
“Framework for Data Management and Analysis in Wastewater Collection Systems’ Inspection”	\$ 55,200.00
2007 PITA	Pittsburgh, PA
“Coordination of Campus Sensing and Diagnostic Platforms for Long-Term Sensor Andrew Project”	\$ 27,600.00
2007 PITA	Pittsburgh, PA
“Continuous Monitoring of Distributed Pipeline Systems”	\$ 55,200.00
2006 RedZone Robotics	Pittsburgh, PA
“Sewage Pipe Defect Classification”	\$27,000.00

2006 Carnegie Mellon University "The Global Education Initiative – ICCM International Collaborative Construction Management"	Pittsburgh, PA  \$30,000.00
2006 (SEER) Steinbrenner Institute of Environmental Education and Research "Advanced Infrastructure Systems Project"	Pittsburgh, PA  \$8,000.00
2005 PITA "Automatic Visual Data Interpretation for Pipeline Infrastructure Assessment"	Pittsburgh, PA  \$59,711.00
2005-2006 NETL-DOE "Knowledge Management and Visualization in Support of Vulnerability Assessment of Electricity Production"	Morgantown, WV  \$ 253,522.00
2004 NSF - National Science Foundation - "ITR: IT-Based Collaboration Framework for Preparing Against, Responding to, and Recovering from Disasters Involving Critical Physical Infrastructures"	Arlington, VA  \$ 2,370,002.00
2003 NSF - National Science Foundation - "Career: Knowledge Discovery in Databases and Data Mining as New tools to Support Research and Educational Advances in Modern Construction Management" - REU Supplement	Arlington, VA  \$ 4,979.00
2003 NSF - National Science Foundation - "Dynamic Planning and Control Methodology (DPM) for Large-Scale Concurrent Design and Construction Projects	Arlington, VA  \$397,521.00
2002 NSF - National Science Foundation - "Integration of Unstructured Text Documents in A/E/C Model Based Systems "	Arlington, VA  \$177,227.00
2001 NSF - National Science Foundation - "Career: Knowledge Discovery in Databases and Data Mining as New tools to Support Research and Educational Advances in Modern Construction Management"	Arlington, VA  \$375,000.00
2001 IDOT - Illinois Department of Transportation "Nighttime Construction: Evaluation of Lighting for Highway Construction"	Springfield, IL  \$ 150,000.00
2001 IDOT - Illinois Department of Transportation "Nighttime Construction: Evaluation of Construction Operations	Springfield, IL  \$ 150,000.00
2000 UIUC-CSE – UIUC-Computer Science in Engineering "Information Access and Distribution In Construction Inter-Organizational Processes	Urbana-IL  1RA
2000 CERL - US Army Corps of Engineers – Construction Engineering Research Laboratory "Dr. Checks/CLL"	Champaign, IL  \$10,000.00

1999 University of Illinois at Urbana/Champaign Campus Research Board "Data Mining and Machine Learning: A new approach to evaluate rework"	Urbana, IL  \$25,000.00
1999 NCSA – Nat. Center for Supercomputing Applic. Data Mining in Applications in Civil Engineering	Champaign, IL 4,000 SU Hours

**Former PHD  
Students**

Hyunjoo Kim, Carlos Caldas, Ken-Yu Lin, Ioannis Brilakis, Wei Guo, Chung-Yan Shih, Daniel Oliveira, and Mario Berges.

**PHD Students**

Jianfeng Wu, Likun Tan, Yujie Ying, Saraub Taneja, Adrian Ocneanu, Khatereh Khodaverdi, In-Soo Jung, Jun Shi, Leneve Ong, Derrick Carlson, and Te Gao

**Former PHD  
Students –  
member of thesis  
committee**

Chul So, Shih-Ping Ho, Marco Aurelio Stumpf Gonzales, Ghassan Abu-Lebdeh, Montty Girianna and Khaled Hyari, William East and Amr A. Kandil, Semiha Kiziltas, and Pingbo Tan.

**Journal  
Editorship**

2008-Present	Journal of Computing in Civil engineering - ASCE – Co-Chief Editor
2000-2008	Journal of Computing in Civil engineering - ASCE Associate Editor
2001-Present	Revista da ANTAC –Associação Nacional de Tecnologia do Ambiente Construido – POA – Brazil Editorial Board
2004-Present	International Journal of Architectural Engineering and Design Management – James & James, London - UK Editorial Board
2006-Present	Engineering, Construction and Architectural Management – Emerald – Bradford – UK Editorial Board
2007-Present	Automation in Construction – Elsevier Science – Oxford – UK – Editorial Board
2007-Present	Journal of Advanced Engineering Informatics – Elsevier Science – Oxford – UK – Editorial Board

**Journal Reviewer**

2010-Present	Construction Management and Economics - Routledge – London, UK – Editorial Board
2010-Present	Journal of Construction Engineering and Project Management – Korea Institute of Construction Engineering and Management – Seoul, South Korea – Editorial Board
2001-Present	Automation in Construction – Elsevier Science – Oxford – UK
2001-Present	Journal of Artificial Intelligence in Engineering, Elsevier, Neitherlands
2001-Present	AIEDAM – Artificial Intelligence for Engineering Design, Analysis and Manufacturing, Cambridge University Press, Cambridge – UK
2000-Present	CIDAC – International Journal of Computer Integrated Design and Construction, SETO – London - UK
1999-Present	Computed-Aided Civil and Infrastructure Engineering – Blackwell - Oxford - UK
1999-Present	Construction Management and Economics - E&F.N. Spon – London – UK
1998-Present	Engineering Construction and Architectural Management – Blackwell – Oxford - UK

**Professional Registration**

Professional Civil Engineer – CREA-RS-Brazil  
Registration number 54206D, 1994

**Professional Affiliations**

American Society of Civil Engineering (ASCE) – Member  
Project Management Institute (PMI)  
American Society for Engineering Education (ASEE)  
International Association for Bridge and Structural Engineering (IABSE)  
Conselho Regional de Engenharia e Arquitetura - RS (CREA/RS)  
Sociedade de Engenharia do Rio Grande do Sul (SERGS)

**Professional Service**

2011 – Member of the Scientific Committee of the CIB W078 & W102 Joint Conference, October 2011, Sophia Antipolis, France.

2010 to Present – Member of the Construction Industry Institute (CII) Academic Committee

2010 – Member of the Scientific Committee of the CIB W78 2010 27<sup>th</sup> International Conference of IT in the AEC Industry, November 16-18,

2010, Cairo, Egypt.

2010 – Chair of the Data Mining for Smarter Infrastructure workshop during the SDM 210 SIAM International Conference on Data Mining, May 1, 2010, Columbus, Ohio.

2010 – Member of the Scientific Committee of the 6<sup>th</sup> International Conference on Innovation in AEC – June 9-11, 2010, University Park, USA.

2010 – Member of the International Scientific Committee of the International Conference on Computing in Civil and Building Engineering – ICCBE 2010, June 30-July 2, 2010, Nottingham, UK.

2009 Member of the Scientific Committee of the ASCE International Workshop on Computing in Civil Engineering, June 24-27, 2009, Austin, Texas.

2009 – Member of the scientific committee of NGInfra 2009 Conference India, 2009.

2009 – Member of the Scientific Committee of EG-ICE 2009, Berlin, Germany, 2009.

2009 Member of the International Scientific Committee of the 5<sup>th</sup> International Conference on Construction in the 21<sup>st</sup> Century, May 20-22, 2009, Istanbul, Turkey.

2009 – Member of the Scientific Committee of the 5<sup>th</sup> CIB Conference in Information and Knowledge Management in Building, June 17-19, Rio de Janeiro, Brazil.

2008-2009 – Chair for the ASCE-CI-Construction Research Council Committee.

2007-2008 – Vice Chair for the ASCE-CI-Construction Research Council Committee.

2006-2007– Secretary for the ASCE-CI-Construction Research Council Committee.

2007 - Co-Chair of the ASCE International Workshop on Computing in Civil Engineering, July 24-27, 2007, Pittsburgh, PA.

2005 – Member of the International Program Committee of the 1<sup>st</sup> International Conference on Construction Engineering and Management (ICCEM 2005), October 16-18, 2005, Seoul, Korea.

2005 – Technical Chair of the ASCE 2005 International Conference on Computing in Civil Engineering, July 12-15, Cancun, Mexico.

2004 – Chair of the Information Technology Track for the 12<sup>th</sup> International Conference in Lean Construction, August 3-5, 2004, Elsinore, Denmark.

2004 – Member of the Scientific Committee of the 10<sup>th</sup> International

Conference on Computing in Civil and Building Engineering (ICCCBE),  
2-4 June, 2004, Weimar, Germany.

2003 – Chair of the “Current Trends and Professional Needs for  
Information Technology in Civil Engineering” session for the Information  
Technology in Civil Engineering during the National ASCE Symposium,  
10-11 November, 2003 – Nashville, TN.

2003 – Chair of the Information Technology Track for the 11<sup>th</sup>  
International Conference in Lean Construction, 22-25 July, 2003,  
Blacksburg, VA

2003 – NSF Division of Information & Intelligent Systems Review Panel  
for Data Mining Research, June 16<sup>th</sup>, 2003, Arlington, VA

2003 – Chair of the Information Technology Project Data Integration  
Track for the Construction Research Congress, 19-21 March, 2003 –  
Honolulu, Hawaii.

2002 - Chair of the Information Technology Track for the 10<sup>th</sup>  
International Conference in Lean Construction, 6-8 August, 2002,  
Gramado-RS-Brazil.

2002 – NSF Unsolicited Review Panel for Information Technology and  
Infrastructure, May 31<sup>st</sup>, 2002, Arlington, VA.

2002 - Member of the Technical Committee of the Special Conference  
on Fully Integrated and Automated Project Processes in Civil  
Engineering 23-25 January 2002 - Blacksburg, VA.

2002 - International Co-Chair of the 9<sup>th</sup> ISPE International Conference  
on Concurrent Engineering Research and Applications (CE2002), 27-31  
July, 2002, Cranfield University, UK.

2001 – NSF Review Panel for the Scalable Enterprise Systems Initiative,  
Phase II, 7-8 June, 2001, Arlington, VA.

2003-2007 ASCE – American Society of Civil Engineers – Technical  
Council on Computing & Information Technology (CIT) – **Vice Chair** of  
the Technical Committee on Intelligent Computing

2000-2003 ASCE – American Society of Civil Engineers – Technical  
Council on Computing & Information Technology (CIT) – Secretary of  
the Technical Committee on Intelligent Computing

2003-2007 IABSE – International Association for Bridge and  
Structural Engineering – Member of the Work Commission 6 on  
Information Technology

2000-Present ASCE – American Society of Civil Engineers –  
Technical Council on Computing & Information Technology (CIT) –  
Member of the Technical Committee on Intelligent Computing

2000-Present ASCE – American Society of Civil Engineers – Technical Council on Computing & Information Technology (CIT) – Member of the Technical Committee on Databases and Information Management.

2002-2005 ASCE – American Society of Civil Engineers – Technical Council on Computing & Information Technology (CIT) – **Chair** of the Technical Committee on Databases and Information Management.

1999-Present ASCE – American Society of Civil Engineers – Construction Division – Member of the Technical Committee on Computing in Construction (CIC)

1999-Present ASCE – American Society of Civil Engineers – Member of the Construction Research Council (CRC)

1998-2001 Project Management Institute - Member of the Executive Advisory Council (EAC) – Central Illinois Chapter

1996 Massachusetts Institute of Technology - Organizer of the 1<sup>st</sup>

**University  
Service**

Brazilian Conference on Science and Technology

- Worked with the Brazilian Consulate in Boston, with the Brazilian Embassy in Washington, with the Department of Science and Technology of the Brazilian Foreign Affairs Ministry in Brasilia, and with sponsor companies. Provided the conceptual framework, planned and organized the three days conference. Introduced speakers and co-moderated discussion sections

2008-2009 Carnegie Mellon University Pittsburgh, PA  
CIT P&T Ad Hoc Committee

2005-2007 Carnegie Mellon University Pittsburgh, PA  
University Committee on Nontenure Appointments

2006-Today Carnegie Mellon University Pittsburgh, PA  
Civil and Environmental Engineering Department - Graduate Recruiting and Admission Committee – Chair

2006-Today Carnegie Mellon University Pittsburgh, PA  
Carnegie Mellon University (CMU) – Civil and Environmental Engineering Department – Admission Coordinator for the AIS Group

2006-Today Carnegie Mellon University Pittsburgh, PA  
Carnegie Mellon University (CMU) – Civil and Environmental Engineering Department – Computer Committee

2006-Today Carnegie Mellon University Pittsburgh, PA  
Carnegie Mellon University (CMU) – Civil and Environmental Engineering Department – Publications Committee

2006-Today Carnegie Mellon University Pittsburgh, PA  
Carnegie Mellon University (CMU) – Civil and Environmental  
Engineering Department – Undergraduate Curriculum Committee

2007-Today Carnegie Mellon University Pittsburgh, PA  
Carnegie Mellon University (CMU) – Civil and Environmental  
Engineering Department – Chi Epsilon Faculty Advisor

2001 University of Illinois at Urbana/Champaign Urbana, IL  
Department of Civil and Environmental Engineering Head Search  
Committee

2001 University of Illinois at Urbana/Champaign Urbana, IL  
Department of Civil and Environmental Engineering Information  
Technology Committee

1998-2000 University of Illinois at Urbana/Champaign Urbana, IL  
Construction Search Committee

1999-2001 University of Illinois at Urbana/Champaign Urbana, IL  
Department of Civil and Environmental Engineering Advisory Committee

1999-2001 University of Illinois at Urbana/Champaign Urbana, IL  
Department of Civil and Environmental Engineering Curriculum  
Committee

1999-2001 University of Illinois at Urbana/Champaign Urbana, IL  
Department of Civil and Environmental Engineering Computer Support  
Committee

1997 Massachusetts Institute of Technology Cambridge, MA  
Civil and Environmental Engineering Department – Ethics Committee

1994 - 1998 Massachusetts Institute of Technology Cambridge –  
Webmaster of the Department of Civil and Environmental Engineering

1996 - 1997 AGC/MA IT Task Force - Webmaster

1994 - 1998 Massachusetts Institute of Technology - Webmaster of the  
Brazilian Student Association

**Graduate  
Advisors**

Feniosky Peña-Mora, Robert Logcher, Jerome Connor, John Williams,  
Luiz Fernando Mahlmann Heineck, and Carlos Torres Formoso

**Awards received**

2010 – ASCE Computing in Civil Engineering Award

2010 – American Council on Education Award to recognize innovative  
use of information technology to promote internationalism.

2002 UIUC Office of Instructional Resources, Urbana, IL, Ranked as an  
outstanding instructor according to the Incomplete Lists of Teachers  
Ranked as Excellent for the 2002 spring semester.

2001 UIUC Office of Instructional Resources, Urbana, IL, Ranked as an excellent instructor according to the Incomplete Lists of Teachers Ranked as Excellent for the 2001 spring semester.

2001 National Science Foundation – NSF Career Award Alexandria, VA

1997 Massachusetts Institute of Technology Teacher Assistant Fellowship Cambridge, MA

1996 Massachusetts Institute of Technology Department of Civil and Environmental Engineering Outstanding Student Contribution Cambridge, MA

1993 - 1997 CNPq Doctoral Fellowship Brasilia, Brazil

1985 - 1986 CAPES Masters Fellowship Brasilia, Brazil