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February 7, 2024

Education

Carnegie Mellon University, Pittsburgh, PA, 1984-1991
Ph.D., Computer Science, May 1991

Carnegie Mellon University, Pittsburgh, PA, 1984-1988
M.S., Computer Science, May 1988

Syracuse University, Syracuse, NY, 1980-1984
B.S., Computer Science with Honors, May 1984

Research & Administrative Positions

Keston Executive Director, Information Sciences Institute, April 2020 – present
Interim Keston Executive Director, Information Sciences Institute, June 2018 – April 2020
Division Director, Intelligent Systems Division, October 2017 – June 2018
Research Director, Center on Knowledge Graphs, June 2010 – June 2018
Senior Project Leader, May 2001 – June 2010
Project Leader, May 1997 – May 2001
Senior Research Scientist, August 1991 – May 1997
Information Sciences Institute
University of Southern California

Research Professor, April 2006 – present
Research Associate Professor, November 1998 – March 2006
Research Assistant Professor, September 1991 – November 1998
Computer Science Department
University of Southern California

Research Professor, January 2014 – present
Affiliated Faculty Member, 2010 – January 2014
Spatial Sciences Institute
University of Southern California

Vice Dean of Engineering, April 2020 – present
Viterbi School of Engineering
University of Southern California

Director of Data Science Program, November 2018 – April 2020
Associate Director of Data Informatics, October 2014 – November 2018
University of Southern California

Key Investigator, September 1996 – September 2007

Integrated Media Systems Center
University of Southern California

Cofounder & Chief Scientist, November 1999 – December 2010

Fetch Technologies, Inc.

Acquired by Connotate, Inc. in December, 2011

Strategic Advisor, June 2012 – July 2014

Cofounder & Chief Scientist, November 2004 – June 2012

Geosemble Technologies, Inc.

Acquired by TerraGo Technologies in June 2012

Research Interests

Research focus: Techniques for describing, acquiring, and exploiting the semantics of data: source modeling, schema alignment, ontology alignment, entity linking, data cleaning, information extraction, web data extraction, and combining all of these techniques to create linked data and build knowledge graphs.

Teaching Experience

- **DSCI 558: Building Knowledge Graphs**
Taught jointly with Professor Jay Pujara, University of Southern California, Spring 2021
- **Short course on Building Knowledge Graphs**
BigDat 2020: 6th International Winter School on Big Data, Ancona, Italy, Jan 2020
- **Short course on Building Knowledge Graphs**
BigDat 2019: 5th International Winter School on Big Data, Cambridge, United Kingdom, Jan 2019
- **INF 558: Building Knowledge Graphs**
Taught jointly with Professor Pedro Szekely, University of Southern California, Fall 2017
- **CSCI 548: Information Integration on the Web**
Two sections taught jointly with Professor Pedro Szekely, University of Southern California, Fall 2015
- **CSCI 648: Advanced Information Integration**
Taught jointly with Professor Jose Luis Ambite, University of Southern California, Spring 2015
- **CSCI 548: Information Integration on the Web**
Taught jointly with Professor Jose Luis Ambite, University of Southern California, Spring 2015
- **CSCI 548: Information Integration on the Web**
Two sections taught jointly with Professor Pedro Szekely, University of Southern California, Fall 2014
- **CSCI 599: Geospatial Data Integration**
Taught jointly with Professor Yao-Yi Chiang, University of Southern California, Spring 2014.
- **CSCI 548: Information Integration on the Web**
Taught jointly with Professor Pedro Szekely, University of Southern California, Fall 2013.
- **CSCI 548: Information Integration on the Web**
Taught jointly with Professors Pedro Szekely and Jose Luis Ambite, University of Southern California, Spring 2012.
- **CSCI 599: Geospatial Data Integration**
University of Southern California, Spring 2011.
- **Geospatial Data Integration**
University of Trento, Italy, July 2010.
- **CSCI 548: Information Integration on the Web**
Taught jointly with Professor Kristina Lerman, University of Southern California, Spring 2010.

- **CSCI 548: Information Integration on the Web**
Taught jointly with Professor Kristina Lerman, University of Southern California, Spring 2009.
- **CSCI 548: Information Integration on the Web**
University of Southern California, Spring 2008.
- **CSCI 548: Information Integration on the Web**
University of Southern California, Fall 2006.
- **CSCI 548: Information Integration on the Web**
University of Southern California, Spring 2005.
- **CSCI 548: Information Integration on the Web**
University of Southern California, Spring 2004.
- **CSCI 599: Information Integration on the Web**
University of Southern California, Spring 2003.
- **CSCI 599: Information Integration on the Web**
University of Southern California, Spring 2002.
- **CSCI 541: Artificial Intelligence Planning**
Taught jointly with Dr. James Blythe, University of Southern California, Fall 1998.
- **CSCI 541: Artificial Intelligence Planning**
Taught jointly with Dr. Yolanda Gil, University of Southern California, Fall 1996.
- **CSCI 599: AI Planning Systems**
Taught jointly with Dr. Steve Chien, University of Southern California, Fall 1992.

Honors and Awards

- **First Place in the Map Feature Extraction Challenge**, Jointly led a joint team between USC and the University of Minnesota in the DARPA AI for Critical Mineral Assessment Challenge.
- **AAIA Fellow**, Asia-Pacific Artificial Intelligence Association (AAIA), 2021.
- **IEEE Fellow**, Institute of Electrical and Electronics Engineers (IEEE), 2020.
- **Outstanding Engineering Merit Award**, Orange County Engineering Council, 2020
- **Use-Inspired Research Award**, USC Viterbi School of Engineering, 2018.
- **Donald E. Walker Distinguished Service Award**, IJCAI, 2018.
- **ACM Fellow**, Association of Computing Machinery (ACM), 2017.
- **IAPR Best Paper Prize**, 2017.
Extracting Human Settlement Footprint from Historical Topographic Map Series Using Context-Based Machine Learning
Johannes H. Uhl, Stefan Leyk, Yao-Yi Chiang, Weiwei Duan, and Craig A. Knoblock
8th International Conference on Pattern Recognition Systems (ICPRS-17).
- **Best Research Paper Award**, 2016.
Unsupervised entity resolution on multi-type graphs. Linhong Zhu, Majid Ghasemi-Gol, Pedro Szekely, Aram Galstyan, and Craig A. Knoblock. International Semantic Web Conference (ISWC).
- **Best In-Use Paper Award**, 2015.
Building and using a knowledge graph to combat human trafficking
Pedro Szekely, Craig A. Knoblock, et al.
14th International Semantic Web Conference (ISWC 2015).
- **Robert S. Englemore Memorial Lecture Award**, 2014.

- **Finalist, 2nd LinkedUp Competition**, 2014
LODStories: Learning About Art by Building Multimedia Stories
Jianliang Chen, Yuting Liu, Dipanwita Maulik, Linda Xu, Hao Zhang, Craig A. Knoblock, Pedro Szekely and Miel Vander Sande.
- **Best In-Use Paper Award**, 2013.
Connecting the Smithsonian American Art Museum to the linked data cloud
Pedro Szekely, Craig A. Knoblock, Fengyu Yang, Xuming Zhu, Eleanor Fink, Rachel Allen, and Georgina Goodlander
Extended Semantic Web Conference (ESWC).
- **Best Research Paper Award**, 2012.
Discovering concept coverings in ontologies of linked data sources
Rahul Parundekar, Craig A. Knoblock, and Jose Luis Ambite
International Semantic Web Conference (ISWC).
- **Distinguished Scientist**, Association of Computing Machinery (ACM), 2008.
- **Fellow**, Association for the Advancement of Artificial Intelligence (AAAI), 2004.
- **Best Paper Award**, IEEE/WIC International Conference on Web Intelligence (WI 2003).
- **Meritorious Service Award**, Information Sciences Institute, 1999.
- **Teaching Fellowship**, Information Sciences Institute, Fall, 1996.
- **Best Paper Award**, Canadian Artificial Intelligence Conference, 1994.
- **Graduate Fellowship**, Air Force Laboratory, 1987-1991.
- **Class Scholar**, Syracuse University, 1984.
- **Upper Division Honors**, Syracuse University, 1984.
- **Lower Division Honors**, Syracuse University, 1982.
- **Regents Scholarship**, New York State, 1980-1984.

Invited Talks

- **From Developing New Drugs to Locating Critical Minerals: Using AI to Create Knowledge Graphs that Turn Data into Knowledge**
Keynote talk at the Proceedings of the 15th International SWAT4HCLS Conference on Semantic Web Applications and Tools for Health Care and Life Sciences, February 28, 2024.
- **Exploiting Semantics for Integrating Data on Critical Minerals**
Invited talk at the Earth Science Information Partners (ESIP) Semantic Technologies Webinar Series, January 9, 2024.
- **Exploiting the Semantics of Tables to Clean and Align Data to Build Knowledge Graphs**
Invited talk at the IBM Tabular Data, Semantics and AI Seminar Series, January 26, 2023.
Keynote talk at the Workshop on Graph Learning for Industrial Applications: Finance, Crime Detection, Medicine and Social Media, NeurIPS 2022, December 9, 2022.
- **Building Spatio-temporal Knowledge Graphs from Historical Maps**
Keynote talk at the 1st ACM SIGSPATIAL International Workshop on Geospatial Knowledge Graphs (GeoKG 2022), November 1, 2022.
- **Building and Using Knowledge Graphs to Turn Data into Knowledge**
Keynote talk at the Computing Conference, July 14, 2022. <https://youtu.be/lmbXVrySfvg>
Keynote talk at the Euro-Asia Conference on Frontiers of Computer Science and Information Technology, December 19, 2022
- **Acquiring and Exploiting the Semantics of Data**
Invited talk at the Open Data Science Conference (ODSC) West, Online & San Francisco, CA, November 18, 2021.

- **Building Knowledge Graphs to Solve Societal Problems: Applications, Challenges, and Solutions**
Keynote talk at the International Conference on Computing and Data Science, Online, August 2, 2020
- **Building Knowledge Graphs from Online Sources to Solve Societal Problems**
Keynote talk at The Web Conference Workshop on Linked Data on the Web and its Relationship with Distributed Ledgers (LDOW/LDDL), San Francisco, CA, May 13, 2019
- **Building Knowledge Graphs for Cyber Security**
Plenary talk at the AAAI Workshop on Artificial Intelligence for Cyber Security, Honolulu, Hawaii, January 27, 2019
- **Mining Data from the Deep and Dark Web to Combat the Illicit Art Trade**
Plenary talk at EuroMed 2018: International Conference on Digital Heritage, Nicosia, Cyprus, October 29, 2018
- **From Artwork to Cyber Attacks: Lessons Learned in Building Knowledge Graphs using Semantic Web Technologies**
Plenary talk at the U.S. Semantic Technologies Symposium, March 1, 2018
Invited talk at the University of Trento, Trento, Italy, April 18, 2018
- **Learning to Adapt to Sensor Changes and Failures**
Plenary talk at the IJCAI Workshop on AI for Internet of Things, August 19, 2017
- **Extracting, Aligning, and Linking Data to Build Knowledge Graphs**
Plenary talk at the 1st International Workshop on Industrial Knowledge Graphs, June 25, 2017
- **Lessons Learned in Building Human-Aware Systems for Data Science**
Invited talk at the AAAI Workshop on Human-Aware AI, February 4, 2017
- **Aligning and Integrating Data for Building Knowledge Graphs**
IC Academic Research Symposium, September 22, 2016
- **Creating Linked Knowledge for Cities**
AAAI Workshop on AI for Cities, January 25, 2015
- **Creating and Using Linked Knowledge**
Robert S. Engelmore Memorial Lecture Award, IAAI, July 29, 2014
AI2, Seattle, Wa, July 2, 2014
University of Texas at Austin, June 10, 2014
- **Data Integration for Big Data**
Huawei Strategy and Technology Workshop, May 13, 2013
- **The Role of Semantics in Big Data Integration**
2013 Semantic Technology & Business Conference, June 4, 2013
- **Learning Semantics of Sources for Big Data Integration**
Invited talk at the University of Nebraska at Lincoln, March 27, 2013
Invited talk at the University of Nebraska at Omaha, March 28, 2013
- **Challenges to the Success of Linked Open Data** Invited talk at the Planet Data Roadmapping Workshop at the 2012 Extended Semantic Web Conference, May 30, 2012.
- **Harvesting Named Geographic Features from Raster Maps**
Invited talk at GeoINT 2011 Symposium Interoperability Tech Talks, San Antonio, TX, Oct 18, 2011.
- **Interactive Information Integration for Network Extraction, Discovery, and Analysis**
Invited talk at the Technology Visions for Network Extraction, Discovery, and Analysis Workshop, Vernon, NY, Sept 21, 2011.
- **A General Approach to Discovering, Registering, and Extracting Features from Raster Maps**
Invited talk at the University of California, Santa Barbara, CA, February 3, 2011
Invited talk at Syracuse University, Syracuse, NY, October 6, 2010
Invited talk at Google, Inc., Mountain View, CA, August 25, 2010

- **A Reference-Set Approach to Information Extraction from Unstructured, Ungrammatical Data Sources**
Invited talk at the University of Washington, Seattle, WA, January 21, 2011
Invited talk at the University of Lugano, Lugano, Switzerland, July 12, 2010
- **Building Semantic Descriptions of Linked Data**
Invited talk at the 1st International Workshop on Consuming Linked Data (COLD 2010) at the International Semantic Web Conference, 2010.
Shanghai, China, November 8, 2010
- **Interactively Building Geospatial Mashups**
Keynote talk at the 2nd International Workshop on New Trends in Information Integration
Long Beach, CA, March 5, 2010
- **A General Approach to Discovering, Registering, and Extracting Features from Raster Maps**
Invited talk at the Conference on Document Recognition and Retrieval of the IS&T/SPIE 19th Annual Symposium International Symposium on Electronic Imaging
San Jose, CA, January 20, 2010
- **Geospatial Data Integration for High-level Fusion**
Invited talk at the ONR Workshop Panel on Directions for Higher-Level Fusion Research: Needs and Capabilities
Seattle, WA, July 6, 2009
- **Discovering and Building Semantic Models of Web Sources**
Keynote address at 6th Annual European Semantic Web Conference (ESWC2009)
Heraklion, Greece, June 3, 2009
- **Web-based Learning**
Invited talk at the AFRL Next Generation Reasoning and Learning: Theory and Applications Workshop
Vernon, NY, May 27, 2009
- **Exploiting Open Source Data for Imagery Understanding**
Invited talk at NRO Tech Seminar
Chantilly, VA, February 20, 2009
- **Automatically Discovering, Extracting and Modeling Web Sources for Information Integration**
Invited talk at Università degli Studi di Genova
Genoa, Italy, December 15, 2008
- **Building Mashups by Example**
Invited talk at Microsoft Research
Bellevue, WA, August 1, 2008
- **Finding, Extracting, and Integrating Data from Maps**
Invited talk at University of Nebraska
Lincoln CSE Colloquium Series, November 29, 2007.
- **Beyond the Elves: Making Intelligent Agents Intelligent**
Invited talk at AAAI Spring Symposium on What Went Wrong and Why
Palo Alto, CA, March 28, 2006
- **Learning to Optimize Plan Execution in Information Agents**
Plenary talk at the 6th International Conference on Case-Based Reasoning (ICCBR 2005)
Chicago, IL, USA, August 25, 2005
- **Mining Data from Online and Geospatial Information Sources**
Invited talk at National Geospatial Intelligence Agency (Oct 19, 2004), Central Intelligence Agency (Oct 19, 2004), National Security Agency (Oct 20, 2004)

- **Building Software Agents for Planning, Monitoring, and Optimizing Travel**
Plenary talk at the Eleventh International Conference On Information Technology and Travel & Tourism
Cairo, Egypt, January, 26, 2004
- **Deploying Information Agents on the Web**
Plenary talk at the International Joint Conference on Artificial Intelligence (IJCAI-03)
Acapulco, Mexico, August 15, 2003
- **Integrating Online and Geospatial Information Sources**
Plenary talk at the Summer Assembly of the University Consortium for Geographic Information Science
Monterey, CA, June 17, 2003
- **Information Integration on the Web**
Invited talk at the Planet 2002 Summer School on Planning on the Web, September 2002
- **Exploring Real World Planning**
Invited talk at the AIPS 2002 Workshop, April, 2002
- **Electronic Commerce in the Information Industries**
Invited talk at The 36th Annual Graduate School of Library and Information Science Clinic, April 2-4,
2000
- **Abstraction and Hierarchy in Reinforcement Learning**
Invited talk at NIPS-98 workshop, 1998

Professional Activities

Elected Positions

- **Past President**, International Joint Conferences on Artificial Intelligence, 2013-2015.
- **President**, International Joint Conferences on Artificial Intelligence, 2011-2013.
- **Trustee**, International Joint Conference on Artificial Intelligence, 2007-2015.
- **President**, International Conference on Automated Planning and Scheduling, 2006-2008.
- **President-Elect**, International Conference on Automated Planning and Scheduling, 2004-2006.
- **Treasurer**, Executive Council of the International Conference on Automated Planning and Scheduling,
2002-2004.
- **Executive Council Member**, AAAI, 2001-2004.

2023

- **Program Committee, Research Track**, International Semantic Web Conference, 2023
- **Program Committee, In-Use Track**, International Semantic Web Conference, 2023
- **Steering Committee**, IEEE Transactions on Artificial Intelligence, 2023
- **Associate Editor**, Spatial Algorithms and Systems, 2023
- **Editorial Board**, Data Journal, 2023
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2023
- **Publication Committee**, AAAI Press, 2023

2022

- **Program Committee, Research Track**, International Semantic Web Conference, 2022
- **Program Committee, In-Use Track**, International Semantic Web Conference, 2022
- **Program Committee, Poster and Demos Track**, Extended Semantic Web Conference, 2022
- **Steering Committee**, IEEE Transactions on Artificial Intelligence, 2022
- **Associate Editor**, Spatial Algorithms and Systems, 2022
- **Editorial Board**, Data Journal, 2022
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2022
- **Publication Committee**, AAAI Press, 2022
- **Finance Committee**, IJCAI Inc., 2022

2021

- **Co-Organizer**, IJCAI Workshop on Applied Semantic Extraction and Analytics (ASEA 2021), 2021
- **Program Committee**, IJCKG, 2021
- **Program Committee, In-Use Track**, International Semantic Web Conference, 2021
- **Steering Committee**, IEEE Transactions on Artificial Intelligence, 2021
- **Associate Editor**, Spatial Algorithms and Systems, 2021
- **Editorial Board**, Data Journal, 2021
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2021
- **Publication Committee**, AAAI Press, 2021
- **Finance Committee**, IJCAI Inc., 2021

2020

- **Area Chair**, AAAI 2021
- **Program Committee**, 24th European Conference on Artificial Intelligence (ECAI 2020), 2020
- **Steering Committee**, IEEE Transactions on Artificial Intelligence, 2020
- **Associate Editor**, Spatial Algorithms and Systems, 2020
- **Editorial Board**, Data Journal, 2020
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2020
- **Publication Committee**, AAAI Press, 2020
- **Finance Committee**, IJCAI Inc., 2020

2019

- **Program Committee, Journal Track**, International Semantic Web Conference, 2019
- **Program Committee, In-Use Track**, International Semantic Web Conference, 2019
- **Program Committee**, WWW 2019 Workshop on Knowledge Graph Technology and Applications
- **Associate Editor**, Spatial Algorithms and Systems, 2019
- **Editorial Board**, Data Journal, 2019
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2019
- **Publication Committee**, AAAI Press, 2019
- **Finance Committee**, IJCAI Inc., 2019

2018

- **Organizer**, Workshop on Knowledge Base Construction, Reasoning and Mining, 2018
- **Program Committee, In-Use Track**, International Semantic Web Conference, 2018
- **Program Committee**, 2nd Workshop on Enabling Open Semantic Science, 2018
- **Associate Editor**, Spatial Algorithms and Systems, 2018
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2018
- **Publication Committee**, AAAI Press, 2018
- **Finance Committee**, IJCAI Inc., 2018

2017

- **Senior Program Committee**, AAAI 2017.
- **Senior Program Committee, Research Track**, International Semantic Web Conference, 2017
- **Program Committee, In-Use Track**, International Semantic Web Conference, 2017
- **Program Committee**, Extended Semantic Web Conference, 2017
- **Program Committee**, WWW 2017 Special Track on Semantics and Knowledge, 2017
- **Program Committee**, 1st International Workshop on Industrial Knowledge Graphs, 2017
- **Program Committee**, 1st Workshop on Enabling Open Semantic Science, 2017
- **Associate Editor**, Spatial Algorithms and Systems, 2017
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2017
- **Publication Committee**, AAAI Press, 2017
- **Finance Committee**, IJCAI Inc., 2017

2016

- **Senior Program Committee**, IJCAI 2016
- **Senior Program Committee**, AAAI 2016
- **Program Committee**, Extended Semantic Web Conference, 2016
- **Program Committee**, International Semantic Web Conference, 2016
- **Program Committee**, 15th International Semantic Web Conference Applications Track

- **Program Co-Chair**, 5th Workshop on Knowledge Discovery and Data Mining meets Linked Open Data, 2016
- **Program Committee**, Workshop on Linked Data for Information Extraction, 2016.
- **Associate Editor**, Artificial Intelligence, 2009-2016
- **Associate Editor**, Spatial Algorithms and Systems, 2015-2016
- **Advisory Board Member**, ACM Transactions on Intelligent Systems and Technology, 2016
- **Publication Committee**, AAAI Press, 2016.
- **Finance Committee**, IJCAI Inc., 2016

2015

- **Senior Program Committee**, Conference on Artificial Intelligence, AI & the Web Track, 2015
- **Program Committee**, Workshop on Linked Data for Information Extraction, 2015.
- **Program Committee**, 11th International Conference on Data Integration in the Life Sciences, 2015.
- **Program Committee**, ISWC 5th International Workshop on Linked Science 2015.
- **Associate Editor**, *Artificial Intelligence*, 2009-2016
- **Associate Editor**, *Spatial Algorithms and Systems*, 2015-2016
- **Editorial Board Member**, *Journal of Web Semantics*, 2010-2015.
- **Advisory Board Member**, *ACM Transactions on Intelligent Systems and Technology*, 2015.
- **Editorial Board Member**, *AAAI Press*, 2015.

2014

- **Program Chair**, International Semantic Web Conference, In-Use Track, 2014
- **Program Committee**, Conference on Artificial Intelligence (AAAI), 2014
- **Program Committee**, AAAI Workshop on Discovery Informatics: Scientific Discoveries Enabled by AI, 2014.
- **Program Committee**, Workshop on Linked Data for Information Extraction, 2014. .
- **Student Travel Award Committee**, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2014.
- **Associate Editor**, *Artificial Intelligence*, 2009-2015
- **Editorial Board Member**, *Journal of Web Semantics*, 2010-2015.
- **Advisory Board Member**, *ACM Transactions on Intelligent Systems and Technology*, 2014.
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2014.
- **Editorial Board Member**, *AAAI Press*, 2014.

2013

- **Conference Co-Chair**, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2013.
- **Senior Program Committee Member**, Conference on Artificial Intelligence, AI & the Web Track, 2013
- **Program Committee**, AAAI 2013 Workshop on Semantic Cities.
- **Organizing Committee**, Tenth International Workshop on Information Integration on the Web (IIWeb 2013).
- **Program Committee**, 4th International Workshop on Consuming Linked Data, 2013.
- **Program Committee**, Extended Semantic Web Conference, Tutorials, 2013.
- **Program Committee**, Workshop on Linked Data for Information Extraction, 2013.
- **Program Committee**, ISWC 3rd Workshop on Linked Science 2013
- **Program Committee**, Semantics For Big Data, AAAI Fall Symposium 2013
- **Associate Editor**, *Artificial Intelligence*, 2009-2015
- **Editorial Board Member**, *Journal of Web Semantics*, 2010-2013.
- **Advisory Board Member**, *ACM Transactions on Intelligent Systems and Technology*, 2013.

- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2013.
- **Editorial Board Member**, *AAAI Press*, 2013.

2012

- **Conference Co-Chair**, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2012.
- **Workshop Chair**, Workshop at the Extended Semantic Web Conference on Linked APIs, 2012.
- **Area Chair**, Twenty-Sixth Conference on Artificial Intelligence, 2012.
- **Organizing Committee**, Computing Community Consortium Workshop on Spatial Computing, 2012
- **Steering Committee**, AAAI 2012 Workshop on Semantic Cities.
- **Organizing Committee**, Ninth International Workshop on Information Integration on the Web (IIWeb 2012).
- **Program Committee**, Extended Semantic Web Conference, 2012.
- **Program Committee**, International Semantic Web Conference, 2012.
- **Program Committee**, Workshop on Knowledge Discovery and Data Mining Meets Linked Open Data, 2012.
- **Associate Editor**, *Artificial Intelligence*, 2009-2012
- **Editorial Board Member**, *Journal of Web Semantics*, 2010-2013.
- **Advisory Board Member**, *ACM Transactions on Intelligent Systems and Technology*, 2012.
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2012.
- **Editorial Board Member**, *AAAI Press*, 2012.

2011

- **Conference Chair**, International Joint Conference on Artificial Intelligence, 2011
- **Associate Editor**, *Artificial Intelligence*, 2009-2012
- **Editorial Board Member**, *Journal of Web Semantics*, 2010-2013.
- **Advisory Board Member**, *ACM Transactions on Intelligent Systems and Technology*, 2011.
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2011.
- **Editorial Board Member**, *AAAI Press*, 2011.
- **Special Issue Editor**, *Journal of Web Semantics* on Dealing with the Messiness of the Web of Data, 2011.
- **Program Committee Member**, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2011.
- **Steering Committee**, IIWeb 2011 : Eighth International Workshop on Information Integration on the Web, 2011.

2010

- **Conference Chair**, International Joint Conference on Artificial Intelligence, 2011
- **Associate Editor**, *Artificial Intelligence*, 2009-2012
- **Advisory Board Member**, *ACM Transactions on Intelligent Systems and Technology*, 2010.
- **Editorial Board Member**, *Journal of Web Semantics*, 2010-2013.

- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2010.
- **Editorial Board Member**, *AAAI Press*, 2010.
- **Senior Program Committee Member**, Twenty-Fourth Conference on Artificial Intelligence, AI & the Web Special Track, 2010.
- **Program Committee Member**, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2010.

2009

- **Conference Chair**, International Joint Conference on Artificial Intelligence, 2011
- **Co-organizer**, Workshop on Information Integration on the Web, 2009.
- **Associate Editor**, *Artificial Intelligence*, 2009-2012
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2009.
- **Editorial Board Member**, *AAAI Press*, 2009.
- **Senior Program Committee Member**, Conference on Intelligent User Interfaces, 2009.
- **Program Committee Member**, Twenty-Third Conference on Artificial Intelligence, AI & the Web Special Track, 2009.
- **Program Committee Member**, International Conference on GeoSpatial Semantics, 2009.
- **Program Committee Member**, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2009.

2008

- **Conference Chair**, International Joint Conference on Artificial Intelligence, 2011
- **Conference Co-Chair**, Twenty-Second Conference on Artificial Intelligence, AI & the Web Special Track, 2008.
- **Vice Chair**, International Semantic Web Conference, 2008.
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2008.
- **Editorial Board Member**, *AAAI Press*, 2008.
- **Senior Program Committee**, Conference on Intelligent User Interfaces, 2008.
- **Program Committee Member**, International Conference on Advances in Geographic Information Systems, 2008.
- **Program Committee Member**, Second Workshop on Analytics for Noisy Unstructured Text Data, 2008
- **Panel Member**, National Geospatial-Intelligence Agency Multi-Source, Multi-INT Fusion Panel, State College, PA, December 2-3, 2008.

2007

- **Conference Chair**, International Joint Conference on Artificial Intelligence, 2011
- **Senior Program Committee Member**, National Conference on Artificial Intelligence, 2007.
- **Editorial Board Member**, *Computational Intelligence*, 2005-2007.
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2007.
- **Editorial Board Member**, *AAAI Press*, 2005-2007.
- **Program Committee Member**, Workshop on Information Integration on the Web, 2007.

2006

- **Senior Program Committee Member**, International Joint Conference on Artificial Intelligence, 2007.
- **Senior Program Committee Member**, National Conference on Artificial Intelligence, 2006.
- **Co-organizer**, IJCAI 2007 Workshop on Analytics for Noisy Unstructured Text Data
- **Review Panel Member**, Marine Geosciences External Review of NRL's Battlespace Environments Technology S&T Program, Stennis, September 19-20, 2006.
- **Editorial Board Member**, *Computational Intelligence*, 2005-2007.
- **Editorial Board Member**, *Journal on Foundations and Trends in Web Science*, 2006.
- **Editorial Board Member**, *AAAI Press*, 2005-2007.
- **Program Committee Member**, Workshop on Information Integration on the Web, 2006.

2005

- **Participant**. National Academy of Sciences Workshop on Using Information Technology to Enhance Disaster Management, Washington, D.C., June 22-23, 2005.
- **Editorial Board Member**, *Computational Intelligence*, 2005-2007.
- **Founding Member**, Editorial Board for the *Journal on Foundations and Trends in Web Science*, 2005.
- **Editorial Board Member**, *AAAI Press*, 2005-2007.
- **Program Committee Member**, ACM Conference on Geospatial Information Science (ACM GIS), 2005.
- **Program Committee Member**, International Conference on Geospatial Semantics (GeoS), 2005.
- **Program Committee Member**, Workshop on Representation and Analysis of Web Space (RAWS-05), 2005.
- **Program Committee Member**, International Joint Conference on Artificial Intelligence, 2005.
- **Program Committee Member**, National Conference on Artificial Intelligence, 2005.
- **Program Committee Member**, International Conference on Automated Planning and Scheduling, 2005.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 2005.

2004

- **Guest Editor**, Special issue of *IEEE Intelligent Systems* on Mining the Web, 19((6), November/December, 2004.
- **Senior Program Committee Member**, Semantic Web Conference, 2004
- **Senior Program Committee Member**, National Conference on Artificial Intelligence, 2004.
- **Program Committee Member**, International Conference on Automated Planning and Scheduling, 2004.
- **Program Committee Member**, 17th International FLAIRS Conference Special Track on AI and the Web, 2004.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 2004.

2003

- **Guest Editor**, Special issue of *IEEE Intelligent Systems* on Information Integration on the Web, September, 2003.
- **Co-Chair**, IJCAI'03 Workshop on Information Integration on the Web, 2003.
- **Program Committee Member**, International Conference on Service Oriented Computing, 2003.
- **Program Committee Member**, KDD'03 Workshop on Data Cleaning, Record Linkage and Object Consolidation, 2003.
- **Program Committee Member**, ISWC'03 Semantic Integration Workshop.
- **Program Committee Member**, Conference on AI Planning and Scheduling, 2003.
- **Program Committee Member**, Conference on Innovative Applications of Artificial Intelligence, 2003
- **Editorial Board Member**, *IEEE Intelligent Systems*, 2003.

2002

- **Member**, Joint European-US Working Group on Information Extraction from Digital Libraries, 2002.
- **Member**, DARPA IXO panel study on Information Integration, 2002.
- **Panel Member**, Robotic, Intelligent and Information Systems Evaluation, Science and Technology Foundation, Ministry of Science and Technology, Portugal, February, 2002.
- **Program Committee Member**, Conference on Innovative Applications of Artificial Intelligence, 2002.
- **Program Committee Member**, Conference on AI Planning and Scheduling, 2002.
- **Program Committee Member**, National Conference on Artificial Intelligence, 2002.
- **Program Committee Member**, AIPS 2002 Workshop on Exploring Real-World Planning, 2002.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 2002.

2001

- **Co-Chair**, NASA RIACS Panel on Information Management Requirements, 2001-2002.
- **Program Committee Member**, Conference on Innovation Applications of Artificial Intelligence, 2001.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 2001.

2000

- **Program Co-Chair**, International Conference on AI Planning and Scheduling, 2000.
- **Senior Program Committee Member**, National Conference on Artificial Intelligence, 2000.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 2000.

1999

- **Review Board Member**, Jet Propulsion Laboratory Annual Technology Program Review of the Telecommunications and Mission Operations Directorate (TMOD), 1999.
- **Reviewer**, International Joint Conference on Artificial Intelligence, 1999.
- **Publicity Chair**, Autonomous Agents, 1999.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 1999.

1998

- **Senior Program Committee Member**, National Conference on Artificial Intelligence, 1998.
- **Co-organizer**, AAAI Workshop on AI and Information Integration at the Fourteenth National Conference on Artificial Intelligence, 1998.
- **Program Committee Member**, International Conference on Artificial Intelligence Planning Systems, 1998.
- **Program Committee Member**, International Conference on Autonomous Agents, 1998.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 1998.

1997

- **Senior Program Committee Member**, National Conference on Artificial Intelligence, 1997.
- **Editor**, Department on Trends and Controversies for *IEEE Expert*, 1997.
- **Program Committee Member**, International Conference on Autonomous Agents, 1997.
- **Reviewer**, European Conference on Planning, 1997.
- **Editorial Board Member**, *IEEE Intelligent Systems*, 1997.
- **Editorial Board Member**, *Journal of Artificial Intelligence Research*, 1997.

1996

- **Editorial Board Member**, *Journal of Artificial Intelligence Research*, 1996.
- **Editor**, Department on Trends and Controversies for *IEEE Expert*, 1996.
- **Program Committee Member**, National Conference on Artificial Intelligence, 1996.
- **Reviewer**, International Conference on Artificial Intelligence Planning Systems, 1996.

1995

- **Editorial Board Member**, *Journal of Artificial Intelligence Research*, 1995.
- **Program Committee Member**, Conference on Artificial Intelligence Applications, 1995.
- **Program Committee Member**, Conference on Cooperative Information Systems, 1995.
- **Reviewer**, International Joint Conference on Artificial Intelligence, 1995.
- **Co-organizer**, AAAI Spring Symposium on Information Gathering from Distributed, Heterogeneous Environments, 1995.
- **Panel Member**, National Science Foundation proposal review panel, 1995.

1993

- **Reviewer**, International Joint Conference on Artificial Intelligence, 1993.

1992

- **Associate Chair**, Tenth National Conference on Artificial Intelligence, 1992.
- **Program Committee Member**, Conference on Principles of Knowledge Representation and Reasoning, 1992.

Journal Reviewer

- *Artificial Intelligence*
- *Constraints, An International Journal*
- *Machine Learning*
- *Journal of Artificial Intelligence Research*
- *Journal of the ACM*
- *Journal of Experimental and Theoretical Artificial Intelligence*
- *Journal of Web Semantics*
- *IEEE Transactions on Knowledge and Data Engineering*
- *IEEE Transactions on Pattern Analysis and Machine Intelligence*
- *IEEE Intelligent Systems*
- *International Journal of Cooperative Information Systems*
- *Theory and Practice of Object Systems*
- *World Wide Web Journal*

Graduated Students

- **Minh Tran Xuan Pham, 2022**
Robust and Proactive Error Detection and Correction in Tables
Ph.d., Department of Computer Science, University of Southern California, 2022
- **Marianna Bucchi, 2019**
Exploiting the Semantic Web for the Automatic Extraction of Los Angeles City Data
M.S., Management Engineering, Politecnico di Milano
- **Yuan Shi, 2019**
Learning to Adapt to Sensor Changes and Failures
Ph.d., Department of Computer Science, University of Southern California, 2019
- **Mohsen Taheriyani, 2015**
Learning the Semantics of Structured Data Sources
Ph.d., Department of Computer Science, University of Southern California, 2015
Current position: Research Scientist, Google
- **Bo Wu, 2015**
Iteratively Learning Data Transformation Programs from Examples
Ph.d., Department of Computer Science, University of Southern California, 2015
Current position: Yelp.com
- **Daniel W. Goldberg, 2010**
Spatial Approaches to Reducing Error in Geocoded Data
Ph.D., Department of Computer Science, University of Southern California, 2010
Jointly advised with Professor John Wilson
Current position: Assistant Professor, Texas A&M University, College Station
- **Yao-Yi Chiang, 2010**
Harvesting Geographic Features from Heterogeneous Raster Maps
Ph.D., Department of Computer Science, University of Southern California, 2010
Current position: Assistant Professor, Research, Spatial Sciences, University of Southern California
- **Matthew Michelson, 2009**
A Reference-set Approach to Information Extraction from Unstructured, Ungrammatical Data Sources
Ph.D., Department of Computer Science, University of Southern California, 2009
Current position: Researcher, Inferlink, Inc.

- **Martin Michalowski, 2008**
A General Approach to Using Problem Instance Data for Model Refinement in Constraint Satisfaction Problems
Ph.D., Department of Computer Science, University of Southern California, 2008
Current position: Assistant Professor, University of Minnesota
- **Rattapoom Tuchinda, 2008**
Building Mashups by Example
Ph.D., Department of Computer Science, University of Southern California, 2008
Current position: National Electronics and Computer Technology Center, Thailand
- **Snehal Thakkar, 2007**
A Data Integration Approach to Dynamically Fusing Geospatial Sources
Ph.D., Department of Computer Science, University of Southern California, 2005
Current position: Google, Inc.
- **Mark James Carman, 2006**
Learning Semantic Definitions of Information Sources on the Internet
Ph.D. Thesis, Department of Information and Communication Technology, University of Trento, 2006
Current position: Associate Professor at Politecnico di Milano
- **Ching-Chien Chen, 2005**
Automatically and Accurately Conflating Road Vector Data, Street Maps and Orthoimagery
Ph.D., Department of Computer Science, University of Southern California, 2005
Jointly advised with Professor Cyrus Shahabi
Current position: Director of Research and Development, TerraGo Technologies
- **Matthew Michelson, 2005**
Building Queryable Datasets from Ungrammatical and Unstructured Sources
M.S., Department of Computer Science, University of Southern California, 2005
Current position: Researcher, InferLink
- **Rahul Bakshi, 2004**
Integrating and reasoning about online sources to accurately geocode addresses
M.S., Department of Computer Science, University of Southern California, 2004
Current position: Software Engineer, SiRF Technology
- **Greg Barish, 2003**
Speculative Plan execution for information agents
Ph.D., Department of Computer Science, University of Southern California, 2003
Current position: Chief Technology Officer, InferLink
- **Sheila Tejada, 2002**
Learning object identification rules for information integration
Ph.D., Department of Computer Science, University of Southern California, 2002
Current position: Lecturer, University of Southern California
- **Ion Alexandru Muslea, 2002**
Active Learning with Multiple Views
Ph.D., Department of Computer Science, University of Southern California, 2002
Current position: Research Scientist, Amazon
- **Naveen Ashish, 2000**
Optimizing information mediators by selectively materializing data
Ph.D., Department of Computer Science, University of Southern California, 2000
Current Position: Research Scientist, InferLink
- **Jose Luis Ambite, 1998**
Planning by rewriting
Ph.D., Department of Computer Science, University of Southern California, 1998

Current Position: Research Lead and Research Associate Professor, Information Sciences Institute, University of Southern California

• **Chun-Nan Hsu, 1996**

Learning effective and robust semantic knowledge for database query optimization
Ph.D., Department of Computer Science, University of Southern California, 1996
Current Position: Research Scientist, University of California at San Diego

Publications

Journal Articles

1. Basel Shbita, Craig A Knoblock, Weiwei Duan, Yao-Yi Chiang, Johannes H Uhl, and Stefan Leyk. Building spatio-temporal knowledge graphs from vectorized topographic historical maps. *Semantic Web*, 14(3):527–549, 2023.
2. Yolanda Gil, Daniel Garijo, Deborah Khider, Craig A. Knoblock, Varun Ratnakar, Maximiliano Osorio, Hernan Vargas, Minh Pham, Jay Pujara, Basel Shbita, Binh Vu, Yao-Yi Chiang, Dan Feldman, Yijun Lin, Hayley Song, Vipin Kumar, Ankush Khandelwal, Michael Steinbach, Kshitij Tayal, Shaoming Xu, Suzanne A. Pierce, Lissa Pearson, Daniel Hardesty-Lewis, Ewa Deelman, Rafael Ferreira Da Silva, Rajiv Mayani, Armen R. Kemanian, Yuning Shi, Lorne Leonard, Scott Peckham, Maria Stoica, Kelly Cobourn, Zeya Zhang, Christopher Duffy, and Lele Shu. Artificial intelligence for modeling complex systems: Taming the complexity of expert models to improve decision making. *ACM Transactions on Interactive Intelligent Systems*, 11(2), July 2021.
3. Johannes H. Uhl, Stefan Leyk, Zekun Li, Weiwei Duan, Basel Shbita, Yao-Yi Chiang, and Craig A. Knoblock. Combining remote-sensing-derived data and historical maps for long-term back-casting of urban extents. *Remote Sensing*, 13(18), 2021.
4. Yuan Shi, Ang Li, T. K. Satish Kumar, and Craig A. Knoblock. Building survivable software systems by automatically adapting to sensor changes. *Applied Sciences*, 11(11), 2021.
5. Weiwei Duan, Yao-Yi Chiang, Stefan Leyk, Johannes H. Uhl, and Craig A. Knoblock. Automatic alignment of contemporary vector data and georeferenced historical maps using reinforcement learning. *International Journal of Geographical Information Science*, 34(4):824–849, 2020.
6. Avi Pfeffer, Curt Wu, Gerald Fry, Kenny Lu, Steve Marotta, Mike Reposo, Yuan Shi, TK Satish Kumar, Craig A Knoblock, David Parker, Irfan Muhammad, and Chris Novakovic. Software adaptation for an unmanned undersea vehicle. *IEEE Software*, 36(2):91–96, 2019.
7. Ying Zhang, Qunfei Ma, Yao-Yi Chiang, Craig Knoblock, Xin Zhang, Puhai Yang, Minghe Gao, and Xiang Hu. Extracting geographic features from the internet: A geographic information mining framework. *Knowledge-Based Systems*, 174:57–72, 2019.
8. Johannes H Uhl, Stefan Leyk, Yao-Yi Chiang, Weiwei Duan, and Craig A Knoblock. Automated extraction of human settlement patterns from historical topographic map series using weakly supervised convolutional neural networks. *IEEE Access*, 2019.
9. Weiwei Duan, Yao-Yi Chiang, Stefan Leyk, Johannes H Uhl, and Craig A Knoblock. Automatic alignment of contemporary vector data and georeferenced historical maps using reinforcement learning. *International Journal of Geographical Information Science*, pages 1–26, 2019.
10. Johannes H Uhl, Stefan Leyk, Yao-Yi Chiang, Weiwei Duan, and Craig A. Knoblock. Spatialising uncertainty in image segmentation using weakly supervised convolutional neural networks: a case study from historical map processing. *IET Image Processing*, 12(11):2084–2091, 2018.
11. Johannes H Uhl, Stefan Leyk, Yao-Yi Chiang, Weiwei Duan, and Craig A. Knoblock. Map archive mining: Visual-analytical approaches to explore large historical map collections. *ISPRS International Journal of Geo-Information*, 7(4):148, 2018.

12. Mohsen Taheriyani, Craig A. Knoblock, Pedro Szekely, and Jose Luis Ambite. Learning the semantics of structured data sources. *Journal of Web Semantics*, 37, 2016.
13. Pedro Szekely, Craig A. Knoblock, Fengyu Yang, Xuming Zhu, Eleanor Fink, Rachel Allen, and Georgina Goodlander. Publishing the data of the smithsonian american art museum to the linked data cloud. *International Journal of Humanities and Art Computing (IJHAC)*, 8:152–166, 2014.
14. Yao-Yi Chiang, Stefan Leyk, and Craig A. Knoblock. A survey of digital map processing techniques. *ACM Computing Surveys*, 47(1):1–44, 2014.
15. Yao-Yi Chiang and Craig A. Knoblock. Recognizing text in raster maps. *Geoinformatica*, pages 1–27, 2014. Published Online.
16. Yao-Yi Chiang and Craig A. Knoblock. A general approach for extracting road vector data from raster maps. *International Journal on Document Analysis and Recognition*, 16(1):55–81, 2013.
17. Yao-Yi Chiang and Craig A. Knoblock. A general approach for extracting road vector data from raster maps. *International Journal on Document Analysis and Recognition*, 2011.
18. Rattapoom Tuchinda, Craig A. Knoblock, and Pedro Szekely. Building mashups by demonstration. *ACM Transactions on the Web (TWEB)*, 5(3), July 2011. <http://dx.doi.org/10.1145/1993053.1993058>.
19. Aman Goel, Matthew Michelson, and Craig A. Knoblock. Harvesting maps on the web. *International Journal on Document Analysis and Recognition*, 2010. <http://dx.doi.org/10.1007/s10032-010-0136-2>.
20. Matthew Michelson and Craig A. Knoblock. Constructing reference sets from unstructured, ungrammatical text. *Journal of Artificial Intelligence Research*, 38:189–221, 2010.
21. Daniel W. Goldberg, John P. Wilson, and Craig A. Knoblock. Extracting geographic features from the internet to automatically build detailed regional gazetteers. *International Journal of Geographic Information Science*, 2009.
22. Yao-Yi Chiang, Craig A. Knoblock, Cyrus Shahabi, and Ching-Chien Chen. Automatic and accurate extraction of road intersections from raster maps. *Geoinformatica*, 2008. <http://dx.doi.org/10.1007/s10707-008-0046-3>.
23. Ching-Chien Chen, Craig A. Knoblock, and Cyrus Shahabi. Automatically and accurately conflating raster maps with orthoimagery. *Geoinformatica*, 12(3):377–410, 2008. <http://dx.doi.org/10.1007/s10707-007-0033-0>.
24. Jim Blythe, Dipsy Kapoor, Craig A. Knoblock, Kristina Lerman, and Steven Minton. Information integration for the masses. *Journal of Universal Computer Science*, 14(11):1811–1837, 2008.
25. Daniel W. Goldberg, John P. Wilson, Craig A. Knoblock, Beate Ritz, and Myles G Cockburn. An effective and efficient approach for manually improving geocoded data. *International Journal of Health Geographics*, 7(60), 2008. doi:10.1186/1476-072X-7-60.
26. Matthew Michelson and Craig A. Knoblock. Creating relational data from unstructured and ungrammatical data sources. *Journal of Artificial Intelligence Research (JAIR)*, 31:543–590, 2008.
27. Greg Barish and Craig A. Knoblock. Speculative plan execution for information gathering. *Artificial Intelligence*, 172(4-5):413–453, 2008. <http://dx.doi.org/10.1016/j.artint.2007.08.002>.
28. Craig A. Knoblock, Jose Luis Ambite, Kavita Ganesan, Maria Muslea, Steven Minton, Greg Barish, Evan Gamble, Claude Nanjo, Kane See, Cyrus Shahabi, , and Ching-Chien Chen. Entitybases: Compiling, organizing and querying massive entity repositories. In *International Conference on Artificial Intelligence (ICAI'07)*, Las Vegas, Nevada, USA, June 2007.
29. Matthew Michelson and Craig A. Knoblock. Unsupervised information extraction from unstructured, ungrammatical data sources on the world wide web. *International Journal of Document Analysis and Recognition (IJ DAR), Special Issue on Noisy Text Analytics*, 10(3-4):211–226, 2007.
30. Mark Carman and Craig A. Knoblock. Learning semantic definitions of online information sources. *Journal of Artificial Intelligence Research (JAIR)*, 30:1–50, 2007.
31. Kristina Lerman, Anon Plangprasopchok, and Craig A. Knoblock. Semantic labeling of online information sources. *International Journal on Semantic Web and Information Systems*, 3(3):36–56, 2007.

32. Daniel W. Goldberg, John P. Wilson, and Craig A. Knoblock. From text to geographic coordinates: The current state of geocoding. *Journal of the Urban and Regional Information Systems Association*, 19(1):33–46, 2007. <http://urisa.org/goldberg>.
33. Ching-Chien Chen, Craig A. Knoblock, and Cyrus Shahabi. Automatically conflating road vector data with orthoimagery. *Geoinformatica*, 10(4):495–530, December 2006.
34. Ion Muslea, Steve Minton, and Craig A. Knoblock. Active learning with multiple views. *Journal of Artificial Intelligence Research*, 27:203–233, 2006.
35. Shou de Lin and Craig A. Knoblock. Sergeant: A framework for building more flexible web agents by exploiting a search engine. *Web Intelligence and Agent Systems*, 3(1):1–15, 2005.
36. Greg Barish and Craig A. Knoblock. An expressive language and efficient execution system for software agents. *Journal of Artificial Intelligence Research*, 23:625–666, 2005.
37. Snehal Thakkar, Jose Luis Ambite, and Craig A. Knoblock. Composing, optimizing, and executing plans for bioinformatics web services. *VLDB Journal, Special Issue on Data Management, Analysis and Mining for Life Sciences*, 14(3):330–353, Sep 2005.
38. Kristina Lerman, Steven N. Minton, and Craig A. Knoblock. Wrapper maintenance: A machine learning approach. *Journal of Artificial Intelligence Research*, 18:149–181, 2003.
39. Naveen Ashish, Craig A. Knoblock, and Cyrus Shahabi. Selectively materializing data in mediators by analyzing user queries. *International Journal of Cooperative Information Systems*, 11(1), March, 2002.
40. Jose Luis Ambite and Craig A. Knoblock. Planning by rewriting. *Journal of Artificial Intelligence Research*, 15:207–261, 2001.
41. Sheila Tejada, Craig A. Knoblock, and Steven Minton. Learning object identification rules for information integration. *Information Systems*, 26(8), 2001.
42. Jose Luis Ambite, Craig A. Knoblock, Ion Muslea, and Andrew Philpot. Compiling source descriptions for efficient and flexible information integration. *Journal of Intelligent Information Systems*, 16(2):149–187, March 2001.
43. Craig A. Knoblock, Steven Minton, Jose Luis Ambite, Naveen Ashish, Ion Muslea, Andrew G. Philpot, and Sheila Tejada. The ariadne approach to web-based information integration. *International Journal of Cooperative Information Systems (IJCIS), Special Issue on Intelligent Information Agents: Theory and Applications*, 10(1/2):145–169, 2001.
44. Ion Muslea, Steven Minton, and Craig A. Knoblock. Hierarchical wrapper induction for semistructured information sources. *Autonomous Agents and Multi-Agent Systems*, 4(1/2), March 2001.
45. José Luis Ambite and Craig A. Knoblock. Flexible and scalable cost-based query planning in mediators: A transformational approach. *Artificial Intelligence Journal*, 118(1-2):115–161, April 2000.
46. Chun-Nan Hsu and Craig A. Knoblock. Semantic query optimization for query plans of heterogeneous multi-database systems. *IEEE Transactions on Knowledge and Data Engineering*, 12(6):959–978, November/December 2000.
47. Chun-Nan Hsu and Craig A. Knoblock. Discovering robust knowledge from databases that change. *Data Mining and Knowledge Discovery*, 2(1), 1997.
48. Yigal Arens, Craig A. Knoblock, and Wei-Min Shen. Query reformulation for dynamic information integration. *Journal of Intelligent Information Systems, Special Issue on Intelligent Information Integration*, 6(2/3):99-130, 1996.
49. Subbarao Kambhampati, Craig Knoblock, and Qiang Yang. Planning as refinement search: A unified framework for evaluating the design tradeoffs in partial order planning. *Artificial Intelligence*, 76(1-2), 1995.
50. Craig A. Knoblock. Automatically Generating Abstractions for Planning. *Artificial Intelligence*, 68(2), 1994.

51. Yigal Arens, Chin Y. Chee, Chun-Nan Hsu, and Craig A. Knoblock. Retrieving and integrating data from multiple information sources. *International Journal on Intelligent and Cooperative Information Systems*, 2(2):127-158, 1993.
52. Steven Minton, Jaime G. Carbonell, Craig A. Knoblock, Daniel R. Kuokka, Oren Etzioni, and Yolanda Gil. Explanation-based learning: A problem solving perspective. *Artificial Intelligence*, 40(1-3):63-118, 1989.

Books

1. Mayank Kejriwal, Craig A. Knoblock, and Pedro Szekely. Knowledge Graphs: Fundamentals, Techniques, and Applications. The MIT Press, Cambridge, MA, 2021.
2. Yao-Yi Chiang, Weiwei Duan, Stefan Leyk, Johannes Uhl, and Craig A. Knoblock. Using Historical Maps in Scientific Studies: Challenges and Best Practices. Springer International Publishing, 2020.
3. Craig A. Knoblock. Generating Abstraction Hierarchies. Kluwer Academic Publishers, Norwell, MA, 1993.

Book Chapters

1. Yao-Yi Chiang, Muhao Chen, Weiwei Duan, Jina Kim, Craig A Knoblock, Stefan Leyk, Zekun Li, Yijun Lin, Min Namgung, Basel Shbita, et al. GeoAI for the digitization of historical maps. In *Handbook of Geospatial Artificial Intelligence*, pages 217–247. CRC Press, 2023.
2. Rahul Parundekar, Craig A. Knoblock, and Jose Luis Ambite. Aligning ontologies of linked data. In *Linked Data Management: Principles and Techniques*. CRC Press, 2014.
3. Yao-Yi Chiang, Stefan Leyk, and Craig A. Knoblock. Efficient and robust graphics recognition from historical maps. In *Graphics Recognition: Achievements, Challenges, and Evolution, Selected Papers of the 8th International Workshop on Graphics Recognition (GREC), Lecture Notes in Computer Science*. Springer, 2012.
4. Kristina Lerman and Craig A. Knoblock. Wrapper maintenance. In Ling Liu and M. Tamer Ozsu, editors, *Encyclopedia of Database Systems*. Springer, Leipzig, Germany, 2009.
5. Yao-Yi Chiang and Craig A. Knoblock. Extracting road vector data from raster maps. In *Graphics Recognition: Achievements, Challenges, and Evolution, Selected Papers of the 8th International Workshop on Graphics Recognition (GREC), Lecture Notes in Computer Science, 6020*, pages 93–105. Springer, New York, 2009.
6. Daniel W. Goldberg, John P. Wilson, and Craig A. Knoblock. Extracting geographic features from the internet to automatically build detailed regional gazetteers. *International Journal of Geographic Information Science*, 23(1):92–128, 2009.
7. Ching-Chien Chen and Craig A. Knoblock. Conflation of geospatial data. In Shashi Shekhar and Hui Xiong, editors, *Encyclopedia of Geospatial Information Science*, pages 133–140. Springer, Leipzig, Germany, 2008. http://dx.doi.org/10.1007/978-0-387-35973-1_182.
8. Kristina Lerman and Craig A. Knoblock. Wrapper maintenance. In Ling Liu and M. Tamer Ozsu, editors, *Encyclopedia of Database Systems*. Springer, Leipzig, Germany, 2008.
9. Craig A. Knoblock and Cyrus Shahabi. Geospatial data integration. In John Wilson and A. Stewart Fotheringham, editors, *The Handbook of Geographic Information Science*. Wiley-Blackwell, 2007. ISBN: 978-1-4051-0796-9.
10. Mehdi Sharifzadeh, Cyrus Shahabi, and Craig A. Knoblock. Learning approximate thematic maps from labeled geospatial data. In Peggy Agouris and Arie Croitoru, editors, *Next Generation Geospatial Information: From Digital Image Analysis to SpatioTemporal Databases*, pages 129–141. A.A. Balkema Publishers, New York, 2005.

11. José Luis Ambite, Craig A. Knoblock, and Steve Minton. Plan optimization by plan rewriting. In Ioannis Vlahavas and Dimitris Vrakas, editors, *Intelligent Techniques for Planning*, pages 121–161. Idea Group Publishing, Hershey, PA, 2005.
12. Kristina Lerman, Steven N. Minton, and Craig A. Knoblock. Machine learning techniques for web wrapper maintenance. In Goran D. Putnik and Maria Manuela Cunha, editors, *Virtual Enterprise Integration: Technological and Organizational Perspectives*, pages 334–350. Idea Group Publishing, Hershey, PA, 2005.
13. Craig A. Knoblock, Kristina Lerman, Steven Minton, and Ion Muslea. Accurately and reliably extracting data from the web: A machine learning approach. In Piotr S. Szczepaniak, Javier Segovia, Janusz Kacprzyk, and Lotfi A. Zadeh, editors, *Intelligent Exploration of the Web*, pages 275–287. Springer-Verlag, Berkeley, CA, 2003.
14. Yigal Arens, Craig A. Knoblock, and Chun-Nan Hsu. Query processing in the sims information mediator. In Michael N. Huns and Munindar P. Singh, editors, *Readings in Agents*. Morgan Kaufmann, San Francisco, CA, 1998.
15. Craig A. Knoblock and Jose-Luis Ambite. Agents for information gathering. In J. Bradshaw, editor, *Software Agents*. AAAI/MIT Press, Menlo Park, CA, 1997.
16. Yigal Arens, Craig A. Knoblock, and Wei-Min Shen. Query reformulation for dynamic information integration. In Gio Wiederhold, editor, *Intelligent Integration of Information*. Kluwer Academic Publishers, Boston, MA, 1996.
17. Yigal Arens, Craig A. Knoblock, and Chun-Nan Hsu. Query processing in the SIMS information mediator. In Austin Tate, editor, *Advanced Planning Technology*. The AAAI Press, Menlo Park, CA, 1996.
18. Chun-Nan Hsu and Craig A. Knoblock. Using inductive learning to generate rules for semantic query optimization. In Gregory Piatetsky-Shapiro and Usama Fayyad, editors, *Advances in Knowledge Discovery and Data Mining*, chapter 17. MIT Press, Boston, MA, 1996.
19. Jaime Carbonell, Oren Etzioni, Yolanda Gil, Robert Joseph, Craig Knoblock, Steven Minton, and Manuela Veloso. Planning and learning in PRODIGY: Overview of an integrated architecture. In Ashwin Ram and David B. Leake, editors, *Goal-Driven Learning*, chapter 11, pages 297–306. MIT Press, Cambridge, MA, 1995.
20. Jaime G. Carbonell, Craig A. Knoblock, and Steven Minton. PRODIGY: An integrated architecture for planning and learning. In Kurt VanLehn, editor, *Architectures for Intelligence*. Erlbaum, Hillsdale, NJ, 1990.
21. Craig A. Knoblock. A theory of abstraction for hierarchical planning. In D. Paul Benjamin, editor, *Change of Representation and Inductive Bias*. Kluwer, Boston, MA, 1990.
22. Steven Minton, Jaime G. Carbonell, Craig A. Knoblock, Daniel R. Kuokka, Oren Etzioni, and Yolanda Gil. Explanation-based learning: A problem solving perspective. In Jaime G. Carbonell, editor, *Machine Learning: Paradigms and Methods*. MIT Press, Boston, MA, 1990.

Magazine Articles

1. Yolanda Gil, Suzanne A. Pierce, Hassan Babaie, Arindam Banerjee, Kirk Borne, Gary Bust, Michelle Cheatham, Imme Ebert-Uphoff, Carla Gomes, Mary Hill, John Horel, Leslie Hsu, Jim Kinter, Craig Knoblock, David Krum, Vipin Kumar, Pierre Lermusiaux, Yan Liu, Chris North, Victor Pankratius, Shanan Peters, Beth Plale, Allen Pope, Sai Ravela, Juan Restrepo, Aaron Ridley, Hanan Samet, and Shashi Shekhar. Intelligent systems for geosciences: An essential research agenda. *Communications of the ACM*, 62(1):76–84, 2018.
2. Mayank Kejriwal, Pedro Szekely, and Craig A. Knoblock. Investigative knowledge discovery for combating illicit activities. *IEEE Intelligent Systems*, 33(1):53–63, 2018.

3. Craig A. Knoblock and Pedro Szekely. Exploiting semantics for big data integration. *AI Magazine*, 2015.
4. Craig A. Knoblock. Reduce data overload. *Earth Imaging Journal*, pages 28–30, March/April 2012.
5. Craig A. Knoblock, Jose Luis Ambite, Mark Carman, Matthew Michelson, Pedro Szekely, and Rattapoom Tuchinda. Beyond the elves: Making intelligent agents intelligent. *AI Magazine*, 29(2):33–42, 2008.
6. Martin Michalowski, Snehal Thakkar, and Craig A. Knoblock. Automatically utilizing secondary sources to align information across data sources. *AI Magazine, Special Issue on Semantic Integration*, 26(1), 2005.
7. Jose Luis Ambite, Craig A. Knoblock, Maria Muslea, and Steven Minton. Heracles ii: Conditional constraint networks for interleaved planning and information gathering. *IEEE Intelligent Systems*, 20(2):25–33, March/April 2005.
8. Martin Michalowski, Jose-Luis Ambite, Snehal Thakkar, Rattapoom Tuchinda, Craig A. Knoblock, and Steve Minton. Retrieving and semantically integrating heterogeneous data from the web. *IEEE Intelligent Systems*, 19(3), 2004.
9. Craig A. Knoblock. Agents for gathering, integrating, and monitoring information for travel planning. *IEEE Intelligent Systems*, 17(6), November/December 2002.
10. Hans Chalupsky, Yolanda Gil, Craig A. Knoblock, Kristina Lerman, Jean Oh, David V. Pynadath, Thomas A. Russ, and Milind Tambe. Electric elves: Agent technology for supporting human organizations. *AI Magazine*, 23(2):11–24, Summer 2002.
11. David N. Allsopp, Patrick Beautement, Michael Kirton, Jeffrey M. Bradshaw, Niranjani Suri, Edmund H. Durfee, Craig A. Knoblock, Austin Tate, and Craig W. Thompson. Coalition agents experiment: Multiagent cooperation in international coalitions. *IEEE Intelligent Systems*, 17(3):26–35, May/June 2002.
12. Craig A. Knoblock, Kristina Lerman, Steven Minton, and Ion Muslea. Accurately and reliably extracting data from the web: A machine learning approach. *IEEE Data Engineering Bulletin*, 23(4), December 2000.
13. Craig A. Knoblock and Steven Minton. The ariadne approach to web-based information integration. *IEEE Intelligent Systems*, 13(5), September/October 1998.
14. Jose Luis Ambite and Craig A. Knoblock. Agents for information gathering. *IEEE Expert: Intelligent Systems and their Applications*, September/October 1997.
15. Craig A. Knoblock and Qiang Yang. Relating the performance of partial-order planning algorithms to domain features. *SIGART Bulletin, Special Issue on Evaluating Plans, Planners and Planning Agents*, 6(1), 1995.

Conference Papers

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Demonstration Papers

1. Jason Slepicka, Chengye Yin, Pedro Szekely, and Craig A. Knoblock. A demonstration of linked data source discovery and integration. In *Proceedings of the ISWC 2014 Posters & Demonstrations Track*, volume 1272. CEUR, 2014.
2. Yao-Yi Chiang, Sima Moghaddam, Sanjauli Gupta, Renuka Fernandes, and Craig A. Knoblock. From map images to geographic names. In *Proceedings of the 22nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*, 2014.
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4. Craig A. Knoblock, Pedro Szekely, Shubham Gupta, Animesh Manglik, Ruben Verborgh, Fengyu Yang, and Rik Van de Walle. Publishing data from the Smithsonian American Art Museum as linked open data. In *Proceedings of the ISWC 2013 Posters & Demonstrations Track*, pages 129–132, 2013.

Selected Technical Reports

1. Jose-Luis Ambite, Yigal Arens, Naveen Ashish, Chin Y. Chee, Chun-Nan Hsu, Craig A. Knoblock, Wei-Min Shen, and Sheila Tejada. The SIMS manual: Version 1.0. Technical Report ISI/TM-95-428, University of Southern California, Information Sciences Institute, 1995.
2. Craig A. Knoblock. *Automatically Generating Abstractions for Problem Solving*. Ph.D. Thesis, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA, 1991.
3. Steven Minton, Craig A. Knoblock, Daniel R. Kuokka, Yolanda Gil, Robert L. Joseph, and Jaime G. Carbonell. PRODIGY 2.0: The manual and tutorial. Technical Report CMU-CS-89-146, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA, 1989.

Tutorials

1. ***Knowledge Graph Construction from Web Corpora***
Mayank Kejriwal, Craig Knoblock, and Pedro Szekely
Tutorial Program, 32nd AAAI Conference on Artificial Intelligence
February 3, 2018
2. ***Constructing Domain-specific Knowledge Graphs***
Mayank Kejriwal, Pedro Szekely and Craig Knoblock
Tutorial Program, 16th International Semantic Web Conference
October 21, 2017
3. ***Information Integration on the Web***
Craig Knoblock and Subbarao Kambhampati
Tutorial Program, Twenty-Second National Conference on Artificial Intelligence
July 22, 2007
4. ***Planning on the Web***
Craig Knoblock and Jose Luis Ambite
Tutorial Program, Fourteenth International Conference on Automated Planning and Scheduling
June 3, 2004
5. ***Information Integration on the Web***
Craig Knoblock and Subbarao Kambhampati
Tutorial Program, Eighteenth National Conference on Artificial Intelligence
July 29, 2002
6. ***Planning and Plan Execution for Information Gathering***
Tutorial Program, PLANET International Summer School on AI Planning
September 16-22, 2002 Halkidiki, Greece
7. ***Recent Advances in AI Planning***
Co-taught with Subbarao Kambhampati
Tutorial Program, Fifteenth National Conference on Artificial Intelligence, 1998.
8. ***Information Gathering and Integration***
Co-taught with Alon Halevy
Tutorial Program, Thirteenth National Conference on Artificial Intelligence, 1996.

Grants, Contracts, & Gifts

1. **Principal Investigator**, Extracting Models of Minerals from Knowledge, DARPA & USGS, \$1,000,000, August 2023.
2. **Principal Investigator**, AI for Map Geolocation and Extraction to Find Critical Minerals, DARPA & USGS (subcontract via Inferlink, Inc.), \$469,346, August 2023.
3. **Co-Principal Investigator**, Combining Efficient Algorithms, Machine Learning and Knowledge Graphs for Scalable, High-Dimensional Nearest Neighbor Search, NGA, \$250,000, March 2022.
4. **Principal Investigator**, Food & Agricultural Assurance & Supply Chains Testbed (FAAST), DARPA (subcontract via UMD ARLIS), \$400,000, April 2021.
5. **Co-Principal Investigator**, FAIR Data Platform for Scaling up Data For FAIR-ification, Novartis, \$613,208, August 2020.
6. **Co-Principal Investigator**, *Leveraging Financial and Economic Data: Business OKN*, National Science Foundation, \$999,117, September 2019.
7. **Principal Investigator**, *Computer Vision Artificial Intelligence Search Tool (CFAST)*, Combating Terrorism Technical Support Office (CTTSO) (subcontract via SRI), \$320,000, July 2019.

8. **Principal Investigator**, *Multi-Source Data Fusion for Space Situational Awareness (SpaceAware)*, Air Force, \$929,441, April 2018.
9. **Co-Principal Investigator**, *MINT: Model INTeGration through Knowledge-Rich Data and Process Composition*, DARPA, \$12,979,881, December 2017.
10. **Principal Investigator**, *Exploiting Context in Cartographic Evolutionary Documents to Extract and Build Linked Spatial-Temporal Datasets*, National Science Foundation, \$642,959, August 2016.
11. **Principal Investigator**, *Automatic Alignment of Design Semantics to Enable Mapping Between CAD Systems*, DARPA, \$120,000, September 2016.
12. **Co-Principal Investigator**, *Effectively Forecasting Evolving Cyber Threats*, IARPA, \$6,476,872, July 2016.
13. **Principal Investigator**, *American Art Collaborative's (AAC) Linked Open Data (LOD) Initiative*, Mellon Foundation (subcontract via Smithsonian American Art Museum), \$100,000, July 2016.
14. **Principal Investigator**, *Large-scale Database Construction of Firms, Organizational Form, Competition, and Industry Change*, National Science Foundation, \$250,000, March 2016.
15. **Principal Investigator**, *Phase 1 of the American Art Collaborative Linked Open Data Initiative*, Institute of Museum and Library Services (subcontract via Crystal Bridges Museum of American Art), \$50,000, January 2016.
16. **Principal Investigator**, *Probabilistic Representation of Intent Commitments to Ensure Software Survival*, DARPA (subcontract via Charles River Associates), \$1,294,800, November 2015.
17. **Principal Investigator**, *Organizing Data for Effective End-User Management*, U.S. Government, \$225,000, August 2015.
18. **Principal Investigator**, *Scalable Coordinated Human-centered Automated Resilient Planning*, DARPA (subcontract via Next Century), \$3,425,000, August 2015.
19. **Co-Principal Investigator**, *Domain-Specific Insight Graphs*, DARPA, \$8,400,000, September 2014.
20. **Co-Principal Investigator**, *Text and Symbol Recognition from Historical Maps, Conveyancing Liability Solutions*, \$120,000, September 2014.
21. **Principal Investigator**, *Creating Linked Open Data About Conflict Indicators for Peacebuilding*, Center for Global Health and Peacebuilding, \$100,000, July 2014.
22. **Principal Investigator**, *Extracting and Integrating User Generated Content*, National Geospatial-Intelligence Agency (subcontract via SRI), \$100,000, October 2014.
23. **Principal Investigator**, *Integrating and Visualizing Diverse Sources of Network Data, Phase II*, Air Force Research Lab (via Northrup Grumman), \$35,000, April 2014.
24. **Principal Investigator**, *Building Integration Tools for Complex Domains*, IARPA (via CUBRC), \$75,000, January 2014.
25. **Principal Investigator**, *Integrating Heterogeneous Sources in a Geospatial Framework to Support Oil Field Operations*, Chevron, \$116,000, January 2014.
26. **Principal Investigator**, *Semantic Alignment to Integration Data*, US Government, \$340,000, November 2013.
27. **Principal Investigator**, *Integrating and Visualizing Diverse Sources of Network Data*, Air Force Research Lab (via Northrup Grumman), \$125,000, October 2013.
28. **Principal Investigator**, *A Unified Approach to Information Integration and Data Mining on Large, Heterogeneous Data Sources*, Huawei Technologies, \$130,000, September 2013.
29. **Principal Investigator**, *Harvesting Geographic Information from Heterogeneous Raster Maps*, TerraGo Technologies, \$75,000, August 2013.
30. **Principal Investigator**, *Integrating Heterogeneous Sources in a Geospatial Framework to Support Oil Field Operations*, Chevron, \$110,000, January 2013.

31. **Principal Investigator**, *U.S. Based Students Travel Support for the ACM SIGSPATIAL 2013*, NSF, \$30,000, August 2013.
32. **Principal Investigator**, *Organizing and Linking Art Museum Information*, Smithsonian American Art Museum, \$200,000, April 2012.
33. **Principal Investigator**, *Integrating Heterogeneous Sources in a Geospatial Framework to Support Oil Field Operations*, Chevron, \$145,000, January 2012.
34. **Co-Principal Investigator**, *Geospatial Analysis of Motion-Based Intelligence Tracking*, Office of Naval Research, \$2,520,000, December 2011.
35. **Principal Investigator**, *Building Linked Open Services from Online Sources*, NSF, \$516,000, October 2011.
36. **Principal Investigator**, *Integrating Heterogeneous Sources in a Geospatial Framework to Support Oil Field Operations*, Chevron, \$96,000, January 2011.
37. **Principal Investigator**, *Domain Vocabulary from Extraction, Transduction, and Auto Induction of Layout (DOVETAIL)*, IARPA, (subcontract from SRI), \$2,307,822, October 2010.
38. **Principal Investigator**, *An Integrated Framework for Geospatial Data Fusion*, DOD, \$300K, August 2010.
39. **Principal Investigator**, **Building Mashups for Decision Making**, DARPA, \$150,000, April 2010.
40. **Principal Investigator**, *Integrating Heterogeneous Sources in a Geospatial Framework to Support Oil Field Operations*, Chevron, \$150,000, January 2010.
41. **Principal Investigator**, *Harvesting Named Geographic Features from Raster Maps*, DOD, \$300,000, October 2009.
42. **Co-Principal Investigator**, *Automation of Technical Reachback for PMESII Best Practices*, OSD STTR Phase I Project (subcontract from Securboratorion), \$100,000, February 2009.
43. **Co-Principal Investigator**, *Trend Analysis and Data Mining for Finding Suspicious Entities*, AFRL STTR Phase II Project (subcontract from Fetch Technologies), \$750,000, November 2008.
44. **Co-Principal Investigator**, *Rapid engagement of humanitarian assistance social networks for ad hoc geospatial data sharing*, National Science Foundation, \$450,000, September 2008.
45. **Principal Investigator**, *Sapling Effort on Information Integration*, DARPA, \$500,000, November 2007.
46. **Co-Principal Investigator** *Exploiting Raster Maps for Imagery Analysis*, AFOSR STTR Phase II Project (subcontract from Geosemble Technologies), \$742,000, October 2007.
47. **Co-Principal Investigator** *Trend Analysis and Data Mining for Finding Suspicious Entities*, AFRL STTR Phase I Project (subcontract from Fetch Technologies), \$100,000, October 2007.
48. **Principal Investigator**, *Geospatial Information Integration and Visualization for Oil Field Operation and Exploration*, Chevron, \$275,000, September 2007.
49. **Principal Investigator**, *Interleaved Information Gathering and Reasoning for Information Fusion*, AFOSR, \$740,000, April 2007.
50. **Principal Investigator**, *Integrating Online Maps with Aerial Imagery*, Microsoft Research, \$40,000, March 2007.
51. **Co-Principal Investigator**, *Exploiting Raster Maps for Imagery Analysis*, AFOSR STTR Phase I Project (subcontract from Geosemble Technologies), \$100,000, September 2006.
52. **Co-Principal Investigator**, *GeoDec: Geospatial Decision Making*, Microsoft Research, \$40,000, January 2006.
53. **Co-Principal Investigator**, *Accurate and Rapid Construction of Information-Rich 3-D City Models*, Microsoft Research, \$100,000, October 2005.

54. **Principal Investigator**, *PSYOP Global Reach*, Institute for Creative Technologies \$200,000, October 2005.
55. **Principal Investigator**, *EntityBases: Large-scale Knowledge Bases for Intelligence Data*, AFRL, \$3,450,000, April 2005.
56. **Principal Investigator**, *Constraint-based Integration of Geospatial and Online Sources*, Institute for Creative Technologies, \$501,000, March 2004.
57. **Principal Investigator**, *A Framework for Integrating Geospatial and Online Data to Respond to Unexpected Events*, NSF ITR Grant, \$1,180,000, October 2003.
58. **Principal Investigator**, *Enduring Personal Cognitive Assistant*, DARPA PAL Program (subcontract from SRI), \$3,125,000, May 2003.
59. **Co-Principal Investigator**, *Proteus: A System for Execution of Dynamically Composed Web Services Using GXA*, Microsoft, \$350,000, January 2003.
60. **Co-Principal Investigator**, *Machine Learning for Record Linkage II*, AFOSR STTR Phase II (subcontract from Fetch Technologies), \$173,000, September 2002.
61. **Principal Investigator**, *Efficiently Accessing and Integrating Worldwide Geographic Data (Tera-World)*, AFOSR DURIP equipment grant, \$208,000, April 2002.
62. **Co-Principal Investigator**, *Composing Web Sources Using a Scalable .Net Middleware*, Microsoft, \$200,000, January 2002.
63. **Co-Principal Investigator**, *Machine Learning for Record Linkage (ML-Link)*, AFOSR STTR Phase I project (subcontract from Fetch Technologies), \$36,000, October 2001.
64. **Principal Investigator**, *WIDELink: A Bootstrapping Approach to Identifying, Modeling, and Linking On-Line Data Sources*, DARPA Evidence Extraction and Link Discovery Program, \$1,485,000, September 2001.
65. **Principal Investigator**, *Rapidly Building High-Performance Information Agents*, AFOSR, \$780,000, December 2000.
66. **Principal Investigator**, *Active Template Reasoning and Optimization*, DARPA Active Templates Program, \$3,911,500, April 2000.
67. **Co-Principal Investigator**, *Agents for Plan Management*, DARPA Cooperative Agent-Based Systems Program, \$2,102,000, July 1998.
68. **Principal Investigator**, *Intelligent Agents for Retrieving, Filtering, and Managing Information*, AFOSR, \$985,000, October 1997.
69. **Co-Principal Investigator**, *A Portable SIMS System for Integrating Inconsistent and Partial Information Sources*, DARPA Intelligent Information Integration Program, \$1,867,000, October 1997.
70. **Co-Principal Investigator**, *Information Integration for Battlefield Awareness*, DARPA Battlefield Awareness and Data Dissemination Program, 750,000, June 1997.
71. **Co-Principal Investigator**, *SIMS for Dealmaker*, DARPA Advanced Logistics Program, \$544,000, August 1996.
72. **Co-Principal Investigator**, *SIMS II: Single Interface to Multiple Sources of Incomplete Information*, ARPA Intelligent Integration of Information Program, \$1,200,000, March 1994.
73. **Principal Investigator**, *Learning and Reformulation for Efficient Multidatabase Retrieval*, National Science Foundation Database and Expert Systems Program, \$259,000, September 1993.
74. **Principal Investigator**, *Building Information Servers*, DARPA Augmentation Award for Science and Engineering Research Training, \$139,000, March 1993.

Patents

- **Processing Time-based Geospatial Data**
Ching-Chien Chen, Craig A. Knoblock, Cyrus Shahabi
US Patent No. 8,953,887, 2015
- **Systems and methods for linking content to individual image features**
Craig A. Knoblock, Cyrus Shahabi, Ching-Chien Chen, Dipsy Kapoor
US Patent No. 8,670,617
- **Precisely Locating Features on Geospatial Imagery**
Ching-Chien Chen, Dipsy Kapoor, Craig A. Knoblock, Cyrus Shahabi
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- **Dynamically linking relevant documents to regions of interest**
Cyrus Shahabi, Craig A. Knoblock, Dipsy Kapoor, Ching-Chien Chen
US Patent No. 8,340,360, 2013
- **Performing Predictive Pricing Based on Historical Data**
Oren Etzioni, Alexander Yates, Craig A. Knoblock, and Rattapoom Tuchinda
US Patent No. 8,566,143, 2013
US Patent No. 7,974,863, 2011
US Patent No. 7,346,520, 2008
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- **System and method for fusing vector data with imagery**
Ching-Chien Chen, Dipsy Kapoor, Craig A. Knoblock, Cyrus Shahabi
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- **System and Method for Fusing Geospatial Data**
Ching-Chien Chen, Craig A. Knoblock, Cyrus Shahabi, and Yao-Yi Chiang
US Patent No. 7,660,441, 2010
- **Wrapper Induction by Hierarchical Data Analysis**
Ion Muslea, Steven Minton, and Craig A. Knoblock
US Patent No. 6,606,625, 2003