Jaime G. Carbonell -- Curriculum Vita

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Citizenship: USA

Academic and Professional Positions Held

2012 - Present	University Professor, School of Computer Science, Carnegie Mellon University
1996 - Present	Director, Language Technologies Institute, Carnegie Mellon University
1995 - Present	Allen Newell Professor of Computer Science, Carnegie Mellon University
2006 - Present	Adjunct Faculty, Dept of Computational Biology, U Pittsburgh Medical School.
2003 – Present	Chairman, Carnegie Speech Corp.
2001 - 2011	Co-Founder, Board chairman, Carnegie Speech Incorporated
1995 - 2003	Co-Founder, Board chairman, Wisdom Technologies Corporation
1986 - 1996	Director, Center for Machine Translation, Carnegie Mellon University
1987 - 1995	Professor of Computer Science, Carnegie Mellon University
1983 - 1987	Associate Professor of Computer Science, Carnegie Mellon University
1983 - 1996	Co-Founder, Director, Scientific advisor, Carnegie Group Inc.
1979 - 1983	Assistant Professor of Computer Science, Carnegie Mellon University
1975 - 1978	Research Fellow in Computer Science, Yale University
1975 - 1977	Teaching Assistant in Computer Science, Yale University
1974 - 1975	Research Assistant, Center for Space Research, MIT
1971 - 1975	Research Programmer, Artificial Intelligence, BBN, Cambridge, MA

Education

1975 - 1979 **Yale University**	PhD 1979 – Computer Science MPhil 1977 - Computer Science MS 1976 - Computer Science
1971 - 1975 **Massachusetts Institute of Technolog**y	SB 1975 - Physics SB 1975 - Mathematics

Professional Organizations and Activities

Member: ACM (elected Chair of SIGART 1983-85), ACL, AAAI (AAAI Fellow 1988-present, AAAI executive committee 1990-92), Cognitive Science Society, Sigma Xi, AMTA.

Government Committees: NSF/CISE Scientific Advisory Committee (2010-2014), NIH Human Genome Scientific Advisory Committee, aka "Watson Committee" (1988-1992). DFKI (National German AI Lab) Scientific Advisory Board (1988-2003). National Institute of Standards and Technology (NIST/IAD), Scientific Advisory Committee (1997-2001), DOE Oakridge National Laboratories Scientific Advisory Committee (1985-1987), GMD/IPSI Information Sciences (Germany) Scientific Advisory board (1990-2001), Citigroup Technology Advisory committee (1987-1995).

Book Series co-Editor: *Lecture Notes in Artificial Intelligence* North American editor, Springer (1996-2008).

Editorial Boards: Machine Learning Journal (1984-2000, editor-in-chief 1988-1993), Machine Translation Journal (1980's), Artificial Intelligence Journal (1984-2008).

Other Accomplishments

Research: Invented multiple well-known algorithms and methods in statistical machine learning including: Proactive Machine Learning (with Donmez) for multi-source cost-sensitive active learning, Linked Conditional Random Fields (L-SCRF, with Liu) for predicting tertiary and quaternary protein folds, new regularization-based transfer learning methods (with Kshirsagar), Maximal Marginal Relevance (MMR, with Goldstein) for information

novelty, retrieval and summarization, topic-conditioned modeling for novelty detection, symmetric optimal phrasal alignment method for trainable example-based and statistical machine translation, series-anomaly modeling for financial fraud detection and syndromic surveillance, knowledge-based interlingual machine translation (and later extended it with colleagues: Tomita, Nirenburg, Nyberg, and Mitamura), transformational analogy for case-based reasoning, derivational analogy for reconstructive justification-based reasoning (with Veloso), robust case-frame parsing (with Hayes), Seeded Version-Space Learning (with polynomial complexity), and developed improvements to several other machine learning algorithms. Current research foci include robust statistical learning and mapping protein sequences to 3D structure and inferring functional properties, automated transfer-rule learning for Machine Translation, , enriched active transfer learning context-based machine translation, and machine translation for very rare languages.

Software artifacts: Protein structure prediction software (with Liu), active and proactive learning algorithms (with Donmez), PRODIGY general-purpose planner (with Minton and Veloso), KANT knowledge-based machine translation (with Nyberg and Mitamura), JAVELIN Question-Answering system (with Nyberg et al), CONDOR search engine (with Callan et al), MMR summarizer engine (with Goldstein), POLITICS simulated reasoning engine, DIPLOMAT speech-MT (with Frederking et al), EBMT example-based general purpose MT (with Brown), SMOKEY distributed sensor-based fire detection and suppression system, and several others.

Education: Created the PhD program at CMU on Language Technologies with 100's of PhD graduates. Designed new courses in Language Technologies, Machine learning, Data Mining and eCommerce. Edited 3 books on Machine Learning. Taught undergraduate and graduate courses in Artificial Intelligence, Machine Learning, Software Engineering, Natural Language Processing, Language Technologies, Data Mining, Information Retrieval, Web-Based Architectures, Machine Translation, Algorithms, and related Computer Science topics.

Other initiatives: Created the Center for Machine Translation at CMU in 1986, and the Language Technologies Institute in 1996. Co-creator & co-director of the Universal Library and million-book project (US, China, India). MT Summit chair 1991, Co-designer of interactive pinpointing speech tutor. Co-creator & co-PI of new Computational Biolinguistics Initiative at CMU. Helped create the CMU-Pitt Computational Biology Program.

Industrial Consulting: Meaningful Machines (participated in designing the context-based machine translation methods, 2002-2009), Industrial Scientific (data mining to improve workplace safety, 2008-present), Carnegie Speech Inc. (business and technology strategy for intelligent language tuotoring, 2002-present) Carnegie Group Inc (expert systems & financial data mining: 1984-1997), Citicorp (financial data mining, real time transactions, new IT technology insertion: 1990-1998), Lycos Inc. (launching the internet search engine 1998-1999), Vivisimo (2003-2006, scientific advisory board), Searchline (launched the new search engine, 2002-2004), Wisdom Technologies (financial optimization and data mining for corporate treasuries, large banks, etc. 1995-2003), Dynamix Technologies (designed their large-scale data mining engine with applications to Homeland Security, AR/AP financial optimization, transactional optimization in bond trading and in re-insurance, pattern discovery in network-wire-transfer streams, syndromic surveillance, etc. 2000-present), Peak Strategy (financial analytics, investment, mining, 2005-2007), Boeing (designed their intensive data mining course), Citibank (technology advisory board for 10 years, focusing on text and data mining, fraud detection, optimization methods, etc.), plus about 10 other shorter-term engagements in data mining in industry, including financial data mining: transactional fraud detection, instant-credit bad-dept minimization, collection effectiveness, cash-flow optimization (sweep/invest/float), data mining for risk/cost tradeoff minimization (FX, interest rate, counterparty, debt, etc), and so on. During these engagements process I designed or co-designed three data mining engines, and evaluated and help improve numerous other data mining engines, including the machine learning algorithms at their core.

Miscellaneous: Gave over 500 invited or refereed-paper presentations (colloquia, seminars, panels, addresses, conferences, key-notes, etc.). Received the *IJCAI Best Paper Award* in 1997 for translingual information retrieval. Received the CMU Computer Science Department's teaching award (1987), the Sperry Fellowship for excellence in AI research (1986), unsolicited gifts from Alcoa and Hughes corporations for research in machine learning, and a "recognition of service" award from the ACM for the SIGART presidency (1983-1985). Provided congressional testimony on machine translation (1990). Leader of the NSF/JTEC study group on Japanese machine translation science and technology (1990-91). Principal investigator or major participant in research grants and contracts totaling over 90 million dollars since 1979 at the CMU School of Computer Science, Center for Machine Translation, and Language Technologies Institute.

Expert witness: Provided expert testimony and depositions, expert reports, advice, consulting , etc. in several cases involving intellectual property including: software design and copyrights, patents for data mining, patents for search engine algorithms and methods, speech recognition, integrated software systems, computational and statistical applications in finance, statistical machine learning, text mining, text processing, natural language, etc.

Patents: Inventor in several issued patents, provided advice on patentability of new software and methods, helped draft software-related patents, conducted prior art searches, composed responses to patent examiners, evaluated validity of issued patents As expert witness provided opinions and reports on patent infringement, patent validity (anticipation, obviousness), claim constructions, Inter Partes Reviews, etc.

Completed PhD Advisees & co-Advisees

1. Masaru Tomita, Professor and Dean, Keio University, Computer Science and Biology
2. Steven Minton, USC-ISI & CTO of Fetch Inc
3. Manuela Veloso, Professor, CMU Computer Science
4. Jack Mostow, Research Professor, CMU Robotics
5. Michael Mauldin, Founder of Lycos Inc. (and former faculty at CMU)
6. Oren Etzioni, Professor, U of Washington (and founder of Metacrawler)
7. Robert Frederking, Sr. System Scientist, CMU Language Technologies Institute
8. Alex Hauptmann, Research Professor, CMU Computer Science
9. Klaus Gross, Chief Scientist, Haley Enterprises
10. Wei-Min Shen, USC-ISI and faculty at USC Computer Science
11. Eric Nyberg, Professor, CMU Language Technologies Inst
12. Ralf Brown, Sr. System Scientist, CMU Language Technologies Institute
13. Craig Knoblock, USC-ISI and faculty at USC Computer Science
14. Akira Ushioda, Fujitsu Labs, Manager Language Technologies
15. Mark Perlin, CEO Cybergenetics
16. Daniel Kuokka, Senior researcher, Tektronix
17. Yolanda Gil, USC-ISI, senior researcher
18. Xuemei Wang, Lockheed Martin & ISLE Computing
19. Robert Joseph, Verizon Communication, senior researcher
20. Jill Fain-Lehman, Founder of Autism Technology, Disney Pittburgh
21. Eugene Fink, Senior Sys Scientist CMU (formerly Asst Prof, U of Florida)
22. Angela Kennedy, President Carnegie Speech (formerly CEO Wisdom Technologies)
23. Alicia Perez, Faculty at Universidad Catolica de Salta, Argentina
24. Jim Blythe, Researcher, USC-ISI
25. Alex Franz, Google Inc.
26. Yan Qu, Senior Researcher, Oracle Corp
27. Jade Goldstein, US DoD research laboratory
28. Boyan Onyskevich, US DoD research laboratory, senior manager
29. Michael Mateas, Faculty, University of CA.
30. Kathreina Probst, Faculty at Georgia Tech
31. Yan Liu, Faculty at University of Southern Cal.
32. Lucian Lita, Siemens Princeton Research Lab
33. Paul Bennett, Microsoft Research Labs
34. Chun Jin, AT&T Research
35. Ariadna Font-Llijtos, IBM, Big Data Labs
36. Ulas Bardak, Postdoctoral fellow, Tokyo University
37. Christian Monson, Oregon Graduate Institute
38. Cenk Gazen, Fetch Inc. Los Angeles
39. Monica Rogati, Linked-In, manager of R&D
40. Vasco Pedro, CEO of Bueda Inc.
41. Meryem Pinar Donmez, Salesforce R&D
42. Jingrui He, Faculty, Stevens Institute
43. Jae-Dong Kim, Google Pittsburgh
44. Rashmi Gangadharaiah, Microsoft Research Labs
45. Oznur Tastan, Microsoft Research Labs, then Bilkent U. Faculty.
46. Jonathan Elsas, Google Pittsburgh
47. Vamshi Ambati, AT&T Research
48. Bin Fu, Google, NYC
49. Mehrbod Sharifi, Google Pittsburgh
50. Ravi Starzl. CMU Faculty
51. Xi Chen, UC Berkeley Postdoc, then NYU Faculty
52. Balakrishnan, Sevaraman, UC Berkeley Postdoc, then CMU Faculty
53. Liu Yang, CMU Postdoc, then Princeton Postdoc
54. Mohit Kumar, Flipkart Inc.
55. Selen Uguroglu, Apple Inc.
56. Luis Marujo
57. Meghana Kshirsagar, IBM Research

Publications

1. KhudaBukhsh. A., Carbonell, J., Jansen, P., “Distributed Interval Estimation Learning in Expert Referral Networks”, in *Proceedings of the European Conference on AI*, 2016.

2. Kshirsagar, M., Carbonell, J., Klein-Seetharaman, J, and Murugesan, K., “Multitask matrix completion for learning protein interactions across diseases”. *Proc. of the 20th Annual Int. Conf. on Research in Computational Molecular Biology* (RECOMB), 2016.

3. “Liu, H., Ma, W., Yang, Y. and Carbonell, J. “Learning Concept Graphs from Online Educational Data”, *Journal of Artificial Intelligence Research*, vol 55, pp. 1059-1090, 2016.

4. Zheng, G., Yang, Y., Carbonell, J., “Efficient Shift-Invariant Dictionary Learning”, in *Proceedings of the ACM KDD Conference*, 2016.

5. Flanigan, J., Dyer, C., Smith, N. and Carbonell, J., “Generation from Abstract Meaning Representation using Tree Transducers”, in *SemEval*, 2016.

6. Flanigan, J., Dyer, C., Smith, N. and Carbonell, J., “Graph-Based AMR Parsing with Infinite Ramp Loss”, in *Proceedings of NAACL*, 2016.

7. Chaplot, D., Yang, Y., Carbonell, J., Koedinger, K., “Data-Driven Automated Induction of Prerequisite Graphs”, in *Proceedings of Educational Data Mining Conference*, 2016

8. Marujo, L., Ling, W., Ribeiro, R., Gersman, A., Carbonell J., Martins de Matos, D., Neto, J., “Exploring Events and Distributed Representations of Text in Multi-Document Summarization”. *Knowledge-Based Systems Journal*, 2016.

9. Marujo, L., Ribeiro, R, Gershman, A., Martins de Matos, D., Neto, D., Carbonell, J., "Event-Based Summarization using a Centrality-As-Relevance Model" *Knowledge and Information Systems Journal*, 2016.

10. Yang, L, Hanneke, S. and Carbonell, J. “Bounds on the Minimax Rate for Estimating a Prior over a VC Class from Independent Learning Tasks”. Proc of the Algorithmic Learning Theory Conf. (ALT), 2015.

11. Gupta, D., Carbonell, J., Gershman, A., Klein, S., and Miller, D. “Unsupervised Phrasal Near-Synonym Generation from Text Corpora”. In *Proc. of the 29th Conference on Artificial Intelligence* (AAAI), 2015.

12. Kshirsagar, M., Thompson, S., Schneider, N., Carbonell, J., Smith, N., Dyer, C. “Frame-Semantic Role Labeling with Heterogeneous Annotations”, In Proc, of the Association of Computational Linguistics (ACL), 2015.

13. Kshirsagar, M,, Schleker, S., Carbonell, J., and Klein-Seetharaman, J., “Techniques for transferring host-pathogen protein interactions knowledge to new tasks", *Frontiers in Microbiology Journal*, 2015.

14. Yang, Y., Liu, H., Carbonell, J., Ma, W., “Concept-Graph Learning from Educational Data”. *Proc. of the 8th Int. Conf. on Web Search and Data Mining* (WSDM), 2015.

15. Dunietz, J., Levin, L., and Carbonell, J., "Annotating Causal Language Using Corpus Lexicography of Constructions." *Proceedings of LAW IX – The 9th Linguistic Annotation Workshop*, 2015.

16. Marujo, L., Portelo, J, Ling, W., Martin de Matos, D., Neto, J., Gershman, A., Carbonell, J., Trancoso, I., Raj, B., “Privacy-Preserving Multi-Document Summarization” *Proc. of the Privacy Preserving Information Retrieval Workshop of the ACM’s Special Interest Group in Information Retrieval Conference* (SIGIR), 2014.

17. Moon, S., and Carbonell, J. “Proactive Learning with Multiple Class-Sensitive Labelers”, in *Proceedings of the International Conference on Data Science and Advanced Analytics*, Shanghai, 2014.

18. Wei-Yu, A. Kılınç-Karzan, F., and Carbonell, J., “Saddle Points and Accelerated Perceptron Algorithms”, *Proc. of International Conference on Machine Learning* (ICML), Beijing, 2014 (Informs Data Mining student best paper).

19. Wei-Yu, A., Ma, W., Yu, Y., Carbonell, J., and Sra S., "Efficient Structured Matrix Rank Miminimization" In *Proceedings of the 27th Neural Information Processing Conference* (NIPS), 2014.

20. Flanigan, J., Thomson, S., Carbonell, J., Dyer, C., and Smith, N. "A Discriminative Graph-Based Parser for the Abstract Meaning Representation" In *Proc, of the Association for Computational Linguistics Conference* (ACL), Baltimore, 2014. (Best paper honorable mention).

21. Khudbukhsh, A., Jansen, P. and Carbonell, J., "Detecting Non-Adversarial Collusion in Crowd Sourcing" In *Proc. of the Conference on Human Computation and Crowdsourcing* (HCOMP), Pittsburgh, 2014.

22. Marujo, L., Carvalho J., Gershman, A., Carbonell, J., Neto, P., Martins de Matos, P. "Textual Event Detection Using Fuzzy Fingerprint", In *Proceedings of IEEE Intelligent Systems*, Warsaw, Poland, September 2014.

23. Tastan, O., Qi, Y., Carbonell, J., and Klein-Seetharaman, J., "Refining Literature-Curated Protein Interactions using Expert Opinions". *Proc. of the Pacific Symposium on Biocomputing*, 2014.

24. Kshirsagar, M., Carbonell, J. and Klein-Seetharaman, J., "Multi-Task Learning for Host-pathogen Protein Interactions", *Proc of ISMB 2013* and *Bioinformatics*, 2013.

25. Yang, L., Blum, A., and Carbonell, J. "Learnability of DNF with Representation-Specific Queries." *Innovations in Theoretical Computer Science (ITCS)*, 2013.

26. Yang. L., and Carbonell, J., "Buy-in-Bulk Active Learning" *Proc of Advances in Neural Information Processing Systems* (NIPS), 2013.

27. Kshirsagar, M., Carbonell, J. and Klein-Seetharaman, J., "Multisource Transfer Learning for Host-Pathogen Protein Interaction Prediction in Unlabeled Tasks", *NIPS Wkshp on Machine Learning for Computational Biology*, 2013.

28. Flanigan, J., Dyer, C., and Carbonell, J., "Large-Scale Discriminative Training for Statistical Machine Translation Using Held-Out Line Search", *Proc. of North American AC (NAACL)*, 2013.

29. Duneitz, J., Levin, L, and Carbonell, J., "The Effects of Lexical Resource Quality on Preference Violation Detection", *Proc. of North American ACL (NAACL)*, 2013.

30. Starzl, R., Brandacher, G., Lee, A., Carbonell, J., Zhang, W. Schnieder, J. Gorantla, B. Schneeberger, S., Zheng, X. "Review of the Early Diagnoses and Assessment of Rejection in Vascualrized Composite Allotransplantation", *Clinical and Developmental Immunology*, Article ID 402980, 2013.

31. Starzl. R., Wolframd, D., Samora, R. Jefferson, B., Barclay, D., Ho, C., Brandacher, G., Schneeberger, S., Lee, A', Carbonell, J., Bodovtz, Y., "Tissue-Specific Patterns of Capase-1 and Cytokines in Excisional Wounds are Altered by Shock in Skin and Muscle", *Journal of Critical Care*, Vol 28, Issue 1, 2013.

32. Ribeiro, R., Marujo, L., Martins de Matos, D., Neto, P., Gershman, A., Carbonell, J., "Self Reinforcement for Important Passage Retrieval", In *Proceedings of ACM SIGIR Conference*, Dublin, 2013.

33. Chen, X., Liu, H., and Carbonell, J., "Structured Sparse Canonical Correlation Analysis", *International Conf, on AI and Statistics* (AISTATS), 2012.

34. Yang, L. Hanneke, S. and Carbonell., J,, "A Theory of Transfer Learning with Applications to Active Learning," *Machine Learning Journal*, 2012, DOI: 10.1007/s10994-012-5310-y

35. Chen, X., He, J., Lawrence, R., and Carbonell, J., "Adaptive Multi-Task Sparse Learning with an Application to fMRI Study", *SIAM International Conference on Data Mining* (SDM), 2012.

36. Chen, X., Lin, Q., Kim, S., Carbonell, J., Xing, E., "Smoothing Proximal Gradient Method for General Structured Sparse Learning", *Annals of Applied Statistics*, 2012. (Full version.)

37. Ambati, V., Vogel, S. and Carbonell, J., "Collaborative Workflow for Crowdsourcing Translation", *Proc of ACM Conference on Computer Supported Cooperative Work*, Washington, USA. 2012.

38. Kshirsagar, M., Carbonell, J. and Klein-Seetharaman, J., “Transfer learning based methods towards the discovery of host-pathogen protein-protein interactions" *Proc of ISMB*, 2012.

39. Kshirsagar, M., Carbonell, J. and Klein-Seetharaman, J., "Techniques to cope with missing data in host-pathogen protein interaction prediction" *J of Bioinformatics* 2012 (also presented at ECCB 2012).

40. Starzl R, Zhang W, Wang Y, Brandacher G, Schneeberger S, Gorantla V, Carbonell J, Barclay D, Vodovotz Y, Zheng XX. “Inflammatory Biomarker Patterns Identify Specific Types of Rat Skin Rejection.” *3rd International Conference on Transplantomics and Biomarkers in Organ Transplantation*. March 2012.

41. Starzl R, Zhang W, Wang Y, Brandacher G, Schneeberger S, Gorantla V, Carbonell J, Barclay D, Vodovotz Y, Zheng XX. “Distinctive Immune Signaling Patterns and Factors in Rat Skin Rejection.” *American Transplant Congress*. June 2012.

42. Fu, B., Fink, E., Gibson, G., and Carbonell J., “Indexing and Fast Near-Matching of Billions of Astronomical Objects”, *Proc. of IASDS*, 2012.

43. Fu, B., Fink, E., Gibson, G., and Carbonell J., “Exact and Approximate Computation of a Histogram of Pairwise Distances between Astronomical Objects”, *Proc of AstoHPC*, 2012.

44. Uguroglu, S., M. Doyle, R. Biedermann, J. Carbonell. “Cost-sensitive Risk Stratification in the Diagnosis of Heart Disease.” *Proc of IAAA*, 2012.

45. Yang, L., and Carbonell, J. “Buy-in-Bulk Active Learning.” *Tech report CMU-ML-12-110*., 2012.

46. Yang, L. Hanneke, S., and Carbonell, J.” Bounds on the Minimax Rate for Estimating a Prior over a VC Class from Independent Learning Tasks”. *Tech report CMU-ML-12-112*., 2012.

47. Marujo, L., Ling, W., Gershman, A., Carbonell, J., Neto, J., Martins de Matos, D., “Recognition of Named-Event Passages in News Articles,” In *Proceedings of 24th International Conference on Computational Linguistics* (COLING), Mumbai, 2012.

48. Marujo, L., Ribeiro, R., Martins de Matos, D., Neto, J., Gershman, A., Carbonell, J., “Key Phrase Extraction of Lightly Filtered Broadcast News,” In *Proceedings of 15th International Conference on Text, Speech and Dialogue* (TSD), Brno, Czech Republic, 2012.

49. Marujo, L., Gershman, A.,, Carbonell, J., Frederking, R., Neto, J., “Supervised Topical Key Phrase Extraction of News Stories using Crowdsourcing, Light Filtering and Co-reference Normalization,” In *Proceedings of the 8th International Conference on Language Resources and Evaluation* (LREC), Istanbul, 2012

50. Balakrishnan, S., Kamisetty, H., Carbonell, J., Lee, S., Langmead, C., “Learning Generative Models for Protein Fold Families”, *Proteins*, Vol 79, Issue 4, pp 1061-1078, 2011,

51. Chen, X., Qi, Y., Bai, Q., Carbonell, J. “Sparse Latent Semantic Analysis”, *Proc of SIAM International Conference on Data Mining* (SDM), 2011.

52. Chen, X., Lin, Q., Kim, S. Carbonell, J. Xing, P. “Smoothing Proximal Gradient Method for Generalized Structure Learning” *Proc of Uncertainty in Artificial Intelligence Conference* (UAI), 2011. (Short version)

53. Yang, L, Hanneke, S., Carbonell, J. “The Identifiability of Priors from Bounded Sample Sizes with Applications to Transfer Learning”, Proc of the 24th *Proc of the Annual Conference on Learning Theory* (COLT), Budapest, 2011.

54. Yang, L. Hanneke, S., Carbonell, J., “The Sample Complexity of Self-Verifying Bayesian Active Learning”, *Proc of the International Conference on Artificial Intelligence and Statistics* (AISTATS), 2011.

55. Uguroglu, S, and J. Carbonell. “Feature Selection for Transfer Learning.” *Proc of ECML/PKDD* (3) 2011. 430-442.

56. Kshirsagar, M., Zhao, Z., Iia, J.m Tastan, O., Singh, I., Carbonell, J. and Klein-Seetharaman, J., “Virus Interactions with Huamn Signal Transduction Patterns”, International Jouinral of Computational Biology and Drug Desigh (4(1): 83-105, 2011.

57. Ambati, V., Vogel S., and Carbonell, J., "Multi-Strategy Approaches to Active Learning for Statistical Machine Translation", *Proc of the the 13th Machine Translation Summit*, Xiamen, China. 2011

58. Ambati, V., Hewavitharana, S., Vogel, S., Carbonell, J., "Active Learning with Multiple Annotations for Comparable Data Classification Tasks", *Proc of Comparable Corpora workshop of ACL*, 2011.

59. Ambati V., Vogel, S., Carbonell, J. "Towards Task Recommendation in Micro-Task Markest", *Proc of 3rd Workshop on Human Computation of AAAI*, 2011.

60. Gopal, S., Yang, Y., Salomatin, K, and Carbonell, J., "Statistical Learning for file-type Identification," *International Conference on Machine Learning Applications* (ICMLA), 2011.

61. Marujo, L., Bugalho, M., Neto, P., Gershman, A., Carbonell, J., "Hourly Traffic Prediction of News Stories", In *3rd International Workshop on Context-Aware Recommender Systems* held as part of the 5th ACM RecSys Conference, Chicago, 2011.

62. Balakrishnan S., Tastan O., Carbonell J., and Klein-Seetharaman J., "Alternative Paths in HIV-1 Targeted Human Signal Transduction Pathways." *BMC Genomics*, Vol. 10. 2010. (Shorter version in *International Conference on Bioinformatics*, 2009.)

63. Balakrishnan, S., Kamisetty, H, Carbonell, J., Lee, S. and Langmead, C., "Learning Networks of Statistical Couplings in Protein Fold Families using L1-regularization", *Proc. of Structural Bioinformatics and Computational Biophysics*, 2010.

64. He, J., and Carbonell, J. "Co-Selection of Features and Instances for Unsupervised Rare Category Analysis." *Proceedings of the SIAM International Conference on Data Mining*, Columbus, OH 2010

65. Donmez, P., Carbonell, J., Schneider, J., "A Probabilistic Framework to Learn from Multiple Annotators with Time-Varying Accuracy", *Proceedings of the SIAM International Conference on Data Mining*, Columbus, OH 2010.

66. Donmez, P. and Carbonell, J. "From Active to Proactive Learning" in *Advances in Machine Learning I*," Koronacki, J, Ras, Z. Wierzchoin S, and Karprzyk (eds.), Studies in Computational Intelligence Series, Vol. 262. pp 97-120.. Springer, 2010.

67. Xiong, L., Chen, X., Huang, T., Schneider, J., Carbonell, J., "Temporal Collaborative Filtering with Bayesian Probabilistic Tensor Factorization", *Pro. of the SIAM International Conf. on Data Mining*, Columbus, OH, 2010.

68. Carbonell, J. "Intelligent Resource Collection for Low-Density Languages" (extended abstract of invited talk), In *Proceedings of LREC*, 2010.

69. Chen, X., Liu, Y. Liu, H., Carbonell, J., "Learning Spatial-Temporal Varying Graphs with Applications to Climate Change Analysis", in Proc of the Twenty-fourth Conference on Artificial Intelligence (AAAI), 2010.

70. Bilotti, M., Elsas, J., Carbonell, J., and Nyberg, E., "Rank Learning for Factoid Question Answering with Linguistic and Semantic Constraints", *Proc. of the 19th ACM Internal Conference on Information and Knowledge Managemen*t (CIKM), 2010.

71. Zhao Z, Xia J, Tastan O, Singh I, Kshirsagar M, Carbonell J, Klein-Seetharaman J. "Virus Interactions with Human Transduction Pathways", *International Journal of Computational Biology Drug Discovery*. 2011;4(1):83-105. doi: 10.1504/IJCBDD.2011.038658. Epub 2011 Feb 17.PM ID:21330695.

72. Gangadharaiah, R., Brown, R. and Carbonell, J. "Monolingual Distributional Profiles for Word Substitution in Machine Translation", *The 23rd International Conference on Computational Linguistics*, (COLING2010), China, August 2010.

73. Gangadharaiah R., Brown, R. and Carbonell, J., "Automatic Determination of Number of clusters for creating Templates in Example-Based Machine Translation", *The 14th Annual Conference of the European Association for Machine Translation*, (EAMT2010), France, May 2010.

74. Chen, X., Qi, Y., Bai, B., Lin, Q., Carbonell, J., “Learning Preferences with Millions of Parameters by Enforcing Sparsity”, International Conference on Data Mining (ICDM), 2010.

75. Chen, X., Lin, Q., Kim, S., Carbonell, J., and Xing, E., “An Efficient Proximal-Gradient Method for General Structured Sparse Learning”, ArXiv: 1005.4717, 2010 (also in NIPS workshop on Sparse Modeling).

76. Chen, X., Kim, S., Lin, Q., Carbonell, J., Xing, E., “Graph-Structured Multi-Task Regression and an Efficient Optimization Method for General Fused Lasso”, arXiv:1005.3579, 2010.

77. Chen, X., Bai, B., Qi, Y., Lin Q., and Carbonell. J., “Sparse Latent Semantic Analysis”, NIPS Workshop on Practical Applications of Sparse Modeling, 2010.

78. Ambati, V., Vogel, S. and Carbonell, J., "Active Learning-Based Elicitation for Semi-Supervised Word Alignment", In *Proceedings of the Association for Computational Linguistics* (ACL), Uppsala, Sweden, 2010.

79. Ambati, V., Vogel, S., and Carbonell, J., "Active Semi-Supervised Learning for Improving Word Alignment", In *Proceedings of the Active Learning for NLP Workshop, NAACL*, Los Angeles, USA, 2010.

80. Ambati, V., Vogel, S. and Carbonell, J., “Active Learning and Crowd-Sourcing for Machine Translation”, *Proceedings of LREC*, 2010.

81. Kim, J., Brown, R. and Carbonell, J "Chunk-Based EBMT". In *Proceedings of the 14the Workshop of the European Association for Machine Translation*, Raphael, France, 2010.

82. Mohamed, T., Carbonell, J. and Ganapathiraju, M., “Active Learning for Human Protein-Protein Interaction Prediction. *BMC Informatics*, Vol 11, Supp 1, 2010.

83. Osmanbeyogly, H., Wehner, J., Carbonell, J. and Ganapathiraju, M., “Active Learning for Membrane Protein Structure Prediction”, *BMC Informatics*, Vol 11, Supp 1, 2010.

84. Yang, L., Hanneke, S., Carbonell, J., “Bayesian Active Learning Using Arbitrary Binary-Valued Queries”, *Proc of the 21st International Conference on Algorithmic Learning Theory* (ALT), 2010.

85. Xiong, L, Chen, X., Huang, T., Schneider, J., and Carbonell, J., “Time-Evolving Collaborative Filtering”, SIAM International Conference on Data Mining (SDM), 2010.

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