

Anatole Gershman

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PROFESSIONAL INTERESTS

Social simulation with LLMs, Information fusion, Automated knowledge acquisition, Active learning, Data Science, Dialog Systems

EDUCATION:

Yale University	PhD Computer Science	5/79
Moscow State Pedagogical University	BS/MS Mathematics and Computer Science	6/71

POSITIONS HELD:

Carnegie Mellon University, Language Technologies Institute, 4/07-6/23, Distinguished Career

Professor – bringing 40+ years of industrial R&D experience to academic research and teaching

Accenture, 12/89-11/06, Global Director of Research (3/97-11/06), Chief Scientist (9/05-11/06), Director of Human Systems Integration Laboratory (12/89-3/97); Led all of the firm's applied technology research and technology assessment efforts worldwide, covering four main areas: intelligent devices, analytics, human computer interaction and systems integration

Coopers & Lybrand, 1/88-11/89, Director of National Decision Support Group; Led and supervised Expert and Knowledge-Based Systems development

Cognitive Systems, Inc., 5/82-12/88, Vice-president, Technology; Led and supervised numerous Artificial Intelligence software development projects including automatic message processing products and Conversational Advisory Systems in banking, brokerage, insurance and travel areas

Schlumberger, 1/80-4/82, Member of Professional Staff; Research and development in applications of AI techniques to geology and signal processing

Bell Laboratories, 4/79-12/80, Member of Technical Staff; Research in natural language processing and man-machine interfaces

PUBLICATIONS:

- [1] Elizabeth Spaulding, Kathryn Conger, Anatole Gershman, Rosario Uceda-Sosa, Susan Windisch-Brown, James Pustejovsky, Peter Anick and Martha Palmer, 2023. The DARPA Wikipedia overlay wikidata as an ontology for natural language processing. *Proceedings of the 19th Joint ACL - ISO Workshop on Interoperable Semantic Annotation (ISA-19)*, June 20, 2023, Nancy, France
- [2] Feng, S.Y., Khetan, V., Sacaleanu, B., Gershman, A. and Hovy, E., 2022. CHARD: Clinical Health-Aware Reasoning Across Dimensions for Text Generation Models. *arXiv preprint arXiv:2210.04191*.
- [3] Rajagopal, D., Khetan, V., Sacaleanu, B., Gershman, A., Fano, A. and Hovy, E., 2021. Cross-domain reasoning via template filling. *arXiv preprint arXiv:2111.00539*.
- [4] Rajagopal, D., Khetan, V., Sacaleanu, B., Gershman, A., Fano, A. and Hovy, E., 2021. Template Filling for Controllable Commonsense Reasoning. *arXiv preprint arXiv:2111.00539*.
- [5] Pl, E.H., Berg-Kirkpatrick, T., Carbonell, J., Chalupsky, H., Gershman, A., Hauptmann, A., Metze, F., Mitamura, T., Chaudhary, A., Chen, X. and Huang, B.P.Y., 2021. OPERA: Operations-oriented Probabilistic Extraction, Reasoning, and Analysis. TAC2021
- [6] Shiang, S.-R.; Rosenthal, S.; Gershman, A.; Carbonell, J. G.; and Oh, J. 2017. Vision-language fusion for object recognition. In AAAI, 4603–4610.
- [7] Marujo, L., Ribeiro, R., Gershman, A., de Matos, D.M., Neto, J.P., Carbonell, J. (2017). Event-based summarization using a centrality-as-relevance model. *Knowledge and Information Systems*, 50(3), 945.

- [8] Hu, Junjie, Jean Oh, and Anatole Gershman. "Learning Phrasal Lexicons for Robotic Commands using Crowdsourcing." *arXiv preprint arXiv:1609.02549*(2016).
- [9] Chen, Yun-Nung, et al. "Unsupervised user intent modeling by feature-enriched matrix factorization." *2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2016.
- [10] Marujo, Luís, et al. "Exploring events and distributed representations of text in multi-document summarization." *Knowledge-Based Systems* 94 (2016): 33-42.
- [11] Gupta, Dishan, et al. "Unsupervised Phrasal Near-Synonym Generation from Text Corpora." *AAAI*. 2015.
- [12] Luís Marujo, Ricardo Ribeiro, David Martins de Matos, João P. Neto, Anatole Gershman, Jaime Carbonell (2015). "Extending a Single-Document Summarizer to Multi-Documnet: a Hierarchical Approach". Proceedings of *SEM2015: the 4th Joint Conference on Lexical and Computational Semantics".
- [13] Tydykov, M., Zeng, M., Gershman, A., & Frederking, R. (2015). Interactive Learning with TREE: Teachable Relation and Event Extraction System. In *Natural Language Processing and Information Systems* (pp. 261-274). Springer International Publishing.
- [14] Chen, Y. N., Sun, M., Rudnicky, A. I., & Gershman, A. (2015, November). "Leveraging behavioral patterns of mobile applications for personalized spoken language understanding". In *Proceedings of the 2015 ACM on International Conference on Multimodal Interaction* (pp. 83-86). ACM.
- [15] Chen, Yun-Nung, et al. "Matrix Factorization with Knowledge Graph Propagation for Unsupervised Spoken Language Understanding." *ACL (1)*. 2015.
- [16] Luís Marujo, José Portêlo, David Martins de Matos, João P. Neto, Anatole Gershman, Jaime Carbonell, Isabel Trancoso, Bhiksha Raj (2014). Privacy-Preserving Important Passage Retrieval. In *Proceeding of PIR'14 workshop at SIGIR 2014*.
- [17] Marujo, Luís, Joao Paulo Carvalho, Anatole Gershman, Jaime Carbonell, João P. Neto, David Martins de Matos, "Textual Event Detection using Fuzzy Fingerprints" *Proceedings of the 7th International Conference on Intelligent Systems IS'14, IEEE*, 2014.
- [18] Marujo, L., Gershman, A., Carbonell, J., Neto, J. P., & de Matos, D. M. (2014). Ensemble Detection of Single & Multiple Events at Sentence-Level. *arXiv preprint arXiv:1403.6023*.
- [19] Tsvetkov, Y., Boystov, L., Gershman, A., Nyberg, E., and Dyer, C. (2014). Metaphor detection with cross-lingual model transfer. In *Proceedings of the Annual Conference of the Association for Computational Linguistics*.
- [20] Levin, L., Mitamura, T., Fromm, D., MacWhinney, B., Carbonell, J., Feely, W., Gershman, A., Ramirez, C., (2014). Resources for the Detection of Conventionalized Metaphors in Four Languages. In *LREC*.
- [21] Yulia Tsvetkov, Elena Mukomel, Anatole Gershman. 2013. Cross-Lingual Metaphor Detection Using Common Semantic Features. In *Proceedings of the First Workshop on Metaphor in NLP*, pages 45-51, Atlanta, Georgia, 13 June 2013.
- [22] Ricardo Ribeiro, Luis Marujo, David Matos, João P. Neto, Anatole Gershman, Jaime Carbonell. 2013. Self reinforcement for important passage retrieval. In *Proceedings of the 36th international ACM SIGIR conference*, pages 845-848, Dublin, Ireland, July 2013.
- [23] Marujo, L., Gershman, A., Carbonell, J., de Matos, D. M., & Neto, J. P. (2013). Co-Multistage of Multiple Classifiers for Imbalanced Multiclass Learning. *arXiv preprint arXiv:1312.6597*.
- [24] Luis Marujo, Anatole Gershman, Jaime Carbonell, Robert Frederking, and Joao P. Neto. 2012. Supervised Topical Key Phrase Extraction of News Stories using Crowdsourcing, Light Filtering and Co-reference Normalization. *Conference Proceedings LREC 2012*.
- [25] Luis Marujo, Ricardo Ribeiro, David Martins de Matos, Joao P. Neto, Anatole Gershman and Jaime Carbonell. 2012 Key Phrase Extraction of Lightly Filtered Broadcast News. In *Text, Speech and Dialogue, Lecture Notes in Computer Science*, 2012, Volume 7499/2012, Springer

- [26] Luis Marujo, Miguel Bugalho, Joao P. Neto, Anatole Gershman, and Jaime Carbonell. 2011. Hourly Traffic Prediction of News Stories. *Proceedings of the 3rd Workshop on Context-aware Recommender Systems (CEUR-CARS'11)*.
- [27] Gershman, A., Wolfe, T., Fink, E., and Carbonell, J. 2011. News Personalization using Support Vector Machines. *Proceedings of the ACM SIGIR International Workshop on Enriching Information Retrieval (SIGIR-ENIR 2011)*.
- [28] Kevin Dela Rosa, Rushin Shah, Bo Lin, Anatole Gershman, Robert Frederking. 2011. Topical Clustering of Tweets. *Proceedings of the ACM SIGIR 3rd Workshop on Social Web Search and Mining (SIGIR - SWSM 2011)*.
- [29] Rushin Shah, Bo Lin, Kevin Dela Rosa, Anatole Gershman, Robert Frederking. 2011. Improving Cross-Document Co-Reference with Semi-Supervised Information Extraction Models *Proceedings of the Symposium on Machine Learning in Speech and Language Processing (MLSLP 2011)*.
- [30] Rushin Shah, Bo Lin, Anatole Gershman and Robert Frederking. "SYNERGY: A Named Entity Recognition System for Resource-scarce Languages such as Swahili using Online Machine Translation." *Proceedings of LREC Workshop on African Language Technology, 2010*
- [31] Bo Lin, Rushin Shah, Robert Frederking and Anatole Gershman. "ENCORE: Experiments with a Synthetic Entity Co-reference Resolution Tool." *Proceedings of LREC Workshop on Resources and Evaluation for Entity Resolution and Entity Management, 2010*
- [32] Bo Lin, Rushin Shah, Robert Frederking and Anatole Gershman. "CONE: Metrics for Automatic Evaluation of Named Entity Co-reference Resolution." *Proceedings of ACL Workshop on Named Entities, 2010*
- [33] Gershman, A., Fink, E., Fu, B., and Carbonell, J. "Analysis of uncertain data: Evaluation of given hypotheses" *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics, 2009*
- [34] Gershman, A., Fink, E., Fu, B., and Carbonell, J. "Analysis of uncertain data: Selection of probes for information gathering" *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics, 2009*
- [35] Gershman, A., Ghani, R., Roqueiro, D. and Wei, G. "Trade-offs in the Use of Bayesian Filtering for Sensor Fusion" *International Workshop on Knowledge Discovery from Sensor Data (Sensor-KDD'07) –held with ACM SIGKDD (KDD-2007)*
- [36] Gershman, A. and Fano, A. "Ubiquitous Services: Extending Customer Relationship Management" in *Ubiquitous and Pervasive Commerce*, George Roussos (editor), Springer, 2006
- [37] Wei, G., Petrushin, V., Gershman, A. "Multiple-camera people localization in an indoor environment" *Knowledge and Information Systems* (2006), 10 (2), 229-241 Springer-Verlag London, 2006
- [38] Petrushin, V., Wei, G., Ghani, R., Gershman, A. "Using Bayesian Reasoning from Sensor Network for Indoor Surveillance" *Pervasive 2006 Workshop Proceedings*, Strang, Cahill and Quigley (editors), Dublin, Ireland, May 2006
- [39] Petrushin, V., Ghani, R., Gershman, A. "A Bayesian Framework for Robust Reasoning from Sensor Networks" *2005 AAAI Spring Symposium on AI Technologies for Homeland Security*, March 21-23, 2005 Stanford University
- [40] Wei, G., Petrushin, V., Gershman, A. "Multiple-Camera People Localization in a Cluttered Environment" *Proc. Fifth International Workshop on Multimedia Data Mining MDM/KDD 2004*, pp. 52-60 August 22, 2004, Seattle, WA
- [41] Liongosari, E., Gershman, A., Singh, M. "Supporting Drug Discovery through Knowledge Modeling and Integration" *Fourth International Conference on Knowledge Management*, June 30 – July 2, 2004, Graz, Austria
- [42] Liongosari, E., Gershman, A., Singh, M. "The Role of Knowledge Modeling in Drug Discovery Research" *UK Academy for Information Systems 2004 Conference*, May 5-7, 2004, Glasgow, United Kingdom

- [43] Liongosari, E., Gershman, A., Singh, M. "A New Generation of Digital Library to Support Drug Discovery Research" *ICEIS-2004*, Porto, Portugal April 2004
- [44] Wan, D., Gershman, A. "Protecting People on the Move through Virtual Personal Security" *International Workshop on Ubiquitous Computing (IWUC 20'04)*, held in conjunction with the *6th International Conference on Enterprise Information Systems (ICEIS)* April 13-14, 2004, Porto, Portugal
- [45] Roussos, G., Gershman, A., Kourouthanassis, P. "Ubiquitous Commerce", Editors, *UbiComp 2003 Adjunct Proceedings*, 2003
- [46] Liongosari, E., Gershman, A. "Knowledge Discovery by Uncovering Hidden Linkages Among Disparate Sources" *Biomedical Information Science and Technology Initiative 2003 Symposium*, National Institute of Health, November 6-7, 2003, Bethesda, Maryland
- [47] Gershman, A. and Fano, A. "Customer Service with Eyes" *Proceedings of Workshop on Ubiquitous Commerce at UbiCom 2003*. October 12-15, Seattle WA, USA, 2003
- [48] Gershman, A. and Lingosari, E. "Can we do better than Google? Using semantics to explore large heterogeneous knowledge sources" Keynote, *First International Workshop on Semantic Web and Databases*, Berlin, September 7-8, 2003
- [49] Nebolsky, C., Yee, N. K., Petrushin, V. A. & Gershman, A. V. (2003). Corporate training in virtual worlds. *Journal of Systemics, Cybernetics and Informatics*, 2(6), 2003
- [50] Fano, A. and Gershman, A. "The Future of Business Services in the Age of Ubiquitous Computing" *Communications of the ACM*. 45 (12), 2002
- [51] Wei, G., Petrushin, V., Gershman, A. "From Data to Insight: The Community of Multimedia Agents" *3rd International Workshop on Multimedia Data Mining (MDM KDD 2002) in conjunction with The 8th ACM SIGKDD Intl. Conf. on Knowledge Discovery & Data Mining*, 23-26 July 2002, Edmonton, Alberta, Canada; also in Osmar R. Zaiane et al (editors) *Mining Multimedia and Complex Data*, LNAI 2797, Springer, 2002
- [52] Fano, A, Gershman, A., Chung, C. "Personal Media Services: A View of Emerging Media Experiences". *Second Workshop on Personalization in Future TV (TV '02) at the Second International Conference on Adaptive Hypermedia and Adaptive Web-based Systems (AH 2002)*, 28 May 2002, Malaga, Spain
- [53] Gershman, A. "Ubiquitous Commerce – Always On, Always Aware, Always Pro-active" *Proceedings of 2002 IEEE Symposium on Applications and the Internet (SAINT 2002)*, Nara, Japan, January 2002
- [54] Bryan, D. and Gershman, A. "The Aquarium: A Novel User Interface Metaphor for Large Online Stores" *Second International Workshop on Web-based Information Visualization (WebVis 2000) and Eleventh International Conference on Database and Expert Systems Applications (DEXA 2000)*. London, UK. September 2000
- [55] Bryan, D. and Gershman, A. "Opportunistic Exploration of Large Consumer Product Spaces" *Proceedings of the ACM Conference on Electronic Commerce (EC '99)*. Denver, CO. November 1999
- [56] Gershman, A., McCarthy, J., Fano, A. "Situated Computing: Bridging the Gap Between Intention and Action" *Proceeding of the 2-nd IEEE International Symposium on Wearable Computing*. San Francisco, CA. October 1999
- [57] Gershman, A. and Sato, S. "Multimedia Communications and Groupware" in *Multimedia, Hypermedia, and Virtual Reality Models, Systems, and Application*, LNCS, Springer, Berlin, 1996; also in *Proceedings of East-West International Conference on Multimedia, Hypermedia and Virtual Reality*. Moscow, Russia. September 1994
- [58] Hughes, L, Gottsman, E., Anonio, M., Gershman, A. "Multimedia Consumer Applications on the Information Superhighway" *Proceeding of the 1994 IEEE Multimedia Conference*. Boston, MA. May 1994
- [59] Gershman, A. and Sato, S. "Multimedia and Groupware" *Proceedings of Groupware '94 Boston*, The Conference Group, Boston, Mass. March 1994

- [60] Lange, B., Gershman, A., Senbetta, G. "Integrated Performance Support for Work Teams" *Proceedings of Groupware '93*, Morgan Kaufman Publishers, San Jose, Ca. Aug. 1993
- [61] Gershman, A. and Gottsman, E. "Use of Hypermedia for Corporate Knowledge Dissemination" *Proceedings of the Twenty-Sixth Annual Hawaii International Conference on System Sciences*. Hawaii. Jan. 1993
- [62] Lange, B., Treleaven, J., Gershman, A. "OMNI: a model for focused collaborative work through issue management" *Proceedings of the Conference on Organizational Computing Systems*, Milpitas, CA, USA, 1993
- [63] Lange, B. and Gershman, A. "OMNI: A Corporate Knowledge Environment for Collaborative Work" *Proceedings of the 1992 IEEE International Conference on Systems, Man, and Cybernetics*. Chicago, IL. Oct. 1992
- [64] Myers, B., Flast, R., Gershman, A., Gottsman, E. "Making Sense of Competitive Intelligence with TIGER. - An Information Visualization Tool" *Proceedings of SPIE/IS&T Symposium on Electronic Imaging 92*, San Jose, CA. 1992
- [65] Gershman, A. and Nelson, R. "Applications of Conversational Advisory Systems or Would You Buy a Used Car from This Computer" *Proceedings of the Fourth Annual AI and Advanced Computer Technology Conference*, Long Beach, CA, 1988
- [66] Gershman A. and Wolf, T. "The Dynamics of Man-Machine Interaction in a Conversational Advisory System" *Proceedings of the 1986 IEEE International Conference on Systems, Man, and Cybernetics*. Atlanta, GA, 1986
- [67] Lytinen, S. and Gershman, A. "ATRANS: Automatic Processing of Money-Transfer Messages" *Proceedings of the American Association for Artificial Intelligence*, Philadelphia, PA, 1986
- [68] Gershman, A. and Miklos, S. "Multi-Purpose Knowledge Base for Maintenance and Operations: Applications to Manpower Planning" *Proceedings of the Workshop on Military Applications of Expert Systems*, Washington, DC, 1985
- [69] Gershman, A. and Wolf, T. "Management of User Expectations in a Conversational Advisory System" *Proceedings of the Second IEEE Conference on Applications of Artificial Intelligence*, Miami, FL, 1985
- [70] Gershman, A., Johnson, P., Wolf, T. "CD Meets The Real World" *Proceedings of the First Annual Workshop on Theoretical Issues in Conceptual Information Processing*, Atlanta, GA, 1984.
- [71] Gershman, A., Lehnert, W., Shwartz, S. "Natural Language Man-Machine Interfaces." *Second International Congress and Exhibition on Data Bases and Data Banks*, Paris, France, 1983
- [72] Gershman, A. "Building a Geological Expert System for Dipmeter Interpretation" *Proceedings of ECAI-82*, Orsay, France, 1982.
- [73] Gershman, A. "A Framework for Conceptual Analyzers." In *Strategies for Natural Language Processing*, W. Lehnert and M. Ringle (eds.). Lawrence Erlbaum Associates, Hillsdale, NJ, 1982
- [74] Gershman, A. "Figuring Out What the User Wants - Steps Toward an Automatic Yellow Pages Assistant" *Proceedings of the 7th International Joint Conference on Artificial Intelligence*, Vancouver, B.C., 1981.
- [75] Carbonell, J., Cullingford, R., Gershman, A. "Knowledge-Based Machine Translation" *IEEE Transactions on Pattern Analysis and Machine Intelligence*. July 1981.
- [76] Gershman, A. "Conceptual Analysis of Noun Groups in English" *Proceedings of the 5th International Joint Conference on Artificial Intelligence*, Cambridge, MA, 1977.

PATENTS

13 US patents issued:

8,108,369; 7,904,501; 7,593,915; 7,401,734; 7,398,231; 7,194,428; 6,766,947; 6,705,522; 6,664,980; 6,539,281; 6,401,085; 6,356,905; 6,199,099