John Hogden

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EDUCATION

Ph.D. in Psychology, received 1991, Advisor: Professor David Rumelhart.
Stanford University, Stanford, CA. Studied human speech perception, Machine Leearning
B.S. in Psychology, received 1985, University of Washington, Seattle, WA.

EXPERIENCE

7/13-Present *Scientist IV*. CCS-3, Los Alamos National Laboratory.

12/12-7/13 Acting Deputy Group Leader, CCS-3, Los Alamos National Laboratory

6/12-12/12 *Scientist IV*. CCS-3, Los Alamos National Laboratory. Developing MATLAB/Python software & techniques for weapons simulation/data comparisons.

2/07-6/12 *Team Leader,* Signal and Image Processing Team, CCS-3. Los Alamos National Laboratory. Led a multiyear 5K-1 million/year project focused on image analysis for weapons images. Developed mitigation techniques for interference for radio-astronomy. Developed techniques for speech processing. Derivative Classifier. Reviewer for *Journal of the Acoustical Society of America*, *Speech Communication*, *Journal of Phonetics*, *The Journal of Speech, Language, and Hearing Research*, and *Information Science*.

3/97-2/07 *Staff Member*, Computer Research Group, Los Alamos National Laboratory
Conducted joint speech processing research with Japan's NTT. Invented MALCOM and MIMICRI for blind function inversion and sequence probability estimation, especially for speech processing. Found insurance fraud using computer algorithms developed for the Health Care Finance Administration. Developed anomaly detection code that found a bug in LANL hydrocode. Developed C++ software distributed by DOE to users in the U.S., Japan, & Portugal.

9/94-3/97 *Post-Doctoral Researcher*, Los Alamos National Laboratory.

9/93-9/94 *Post-Doctoral Researcher* in the Institute for Mathematical Behavioral Sciences at the University of California, Irvine.

2/91-8/93 *Research Scientist,* Haskins Laboratories, a Yale University affiliate, New Haven, CT.

PROGRAMING Python since 2008, C++ since 1997, C since 1986, MATLAB, LaTex, Word, etc.

AWARDS Los Alamos Achievement Awards: 1996, 2003; Defense Programs Award of Excellence: 2005

PERSONAL INFO Currently cleared to the TS/SCI level, endorsed by the LANL Management On-Ramp.

SELECTED PUBLICATIONS

Hogden, J., Vander Wiel, S., Bower, G., Michalak, S., Siemion, A., and Werthimer, D., (2012) Comparison of Radio-frequency Interference Mitigation Strategies for Dispersed Pulse Detection. The Astrophysical Journal, 747(2). Pp. 141-150.

Hogden, J. (2009) A blind algorithm for recovering speech articulator positions from acoustics. Invited presentation to the 43rd Asilomar Conference on Signals, Systems, and Computers. Pacific Grove, CA, Nov. 1-4,

Hogden, J., Rubin, P., McDermott, E., Katagiri, S., & Goldstein, L. (2007). Inverting mappings from smooth paths through R^n to smooth paths through R^m: a technique applied to recovering articulation from acoustics. Invited submission to Speech Communication, Special Issue on Bridging the Gap Between Human and Automatic Speech Processing. Edited by Kirchhof & ten Bosch. 49(5), 361-383

Hogden, J., Brewer, R., (2005). Improvements on Blind Inversion of PINEX Data (U), Presentation to JOWOG-32M, Los Alamos National Laboratory, Los Alamos, NM, September 26-30, 2005, LA-CP-05-0990

Hogden, J., & Nix, D. (2004). Speech Processing Using Multiple Observable Maximum Likelihood Continuity Mapping. U.S. Patent #6,678,658 B1 assigned to the University of California.

Hogden, J., (2002) The manifold advantages of articulatory representations, including microphone and speaker normalization, Guest Lecture, Johns Hopkins University Speaker Recognition Workshop, http://www.clsp.jhu.edu/ws2002/seminars/lecture_hogden.shtml

Hogden, J., & Valdez, P. (2001). Maximum Likelihood Continuity Mapping Package (Version 1.0) [C++ code]. Los Alamos, NM: DOE Energy Science and Technology Center.

Hogden, J. (2000). Speech Processing Using Maximum Likelihood Continuity Mapping. U.S. Patent #6,052,662. assigned to U. of CA.

Hogden, J., Scovel, J., & White, J. (2000). Anomaly Analysis Using Maximum Likelihood Continuity Mapping. U.S. Patent #6,038,388. assigned to U. of CA.

Full List of Publications

Patents:

Hogden, J., & Nix, D. (2004). Speech Processing Using Multiple Observable Maximum Likelihood Continuity Mapping. U.S. Patent #6,678,658 B1 assigned to the University of California.

Hogden, J. (2000). Speech Processing Using Maximum Likelihood Continuity Mapping. U.S. Patent #6,052,662. assigned to University of California.

Hogden, J., Scovel, J., & White, J. (2000). Anomaly Analysis Using Maximum Likelihood Continuity Mapping. U.S. Patent #6,038,388. assigned to University of California.

Software Packages

Maximum Likelihood Continuity Mapping Package (MALCOM vs. 1.0). (1999) U.S.A copyright C-99,159, University of California, LA-CC 99-71. Licensed to: NTT Communication Science Laboratories, Haskins Laboratories, Universidade Tecnica de Lisboa, Japan Advanced Institute of Science and Technology.

LANL Speech Processing Software (C13073), (2013) Classification Review Number: LA-CC-13-002 Export Control Classification Number (ECCN): EAR99

ProcessImage (2012). Described in: Hogden & Unal (2012), Image Analysis Tool for Core Punch Experiments and Simulations (2012). LA-UR-12-24658

Department of Energy Level 2 Milestones contributed to

Secondary Verification and Validation ASC Milestone (2004)

Primary Hydrodynamics Verification and Validation ASC Milestone (2005)

Secondary Verification and Validation ASC (2005)

Plasma Jets Milestone (2005)

Book Chapters:

Loftus, G., & Hogden, J. (1988). Extraction of information from complex visual stimuli: memory performance and phenomenological appearance, The Psychology of Learning and Motivation, (Vol. 22, pp. 139-191). New York: Academic Press.

Journal Articles:

Michalak, S., Dubois, A., Dubois, D., Vander Wiel, S., Hogden, J. (2012) Developing Systems for Real-Time Streaming Analysis. Journal of Computational and Graphical Statistics. 21(3), 561-580.

Hogden, J., Vander Wiel, S., Bower, G., Michalak, S., Siemion, A., and Werthimer, D., (2012) Comparison of radio-frequency interference mitigation strategies for dispersed pulse detection. The Astrophysical Journal, 747(2). 141-150.

Hogden, J., Rubin, P., McDermott, E., Katagiri, S., & Goldstein, L. (2007). Inverting mappings from smooth paths through R^n to smooth paths through R^m: a technique applied to recovering articulation from acoustics. Invited submission to Speech Communication, Special Issue on Bridging the Gap Between Human and Automatic Speech Processing. Edited by Kirchhof & ten Bosch. 49(5), 361-383

Hogden, J. (2007) Blind inversion in speech and weapons image processing. ADTSC Nuclear Weapons Program Highlights. Published by the Theoretical Division, Los Alamos National Laboratory. Los Alamos, NM. 18-19.

Hogden, J., Zlokarnik, I., Lofqvist, A., Gracco, V., Rubin, P., & Saltzman, E. (1996). Accurate recovery of articulator positions from acoustics -- new conclusions based on human data. Journal of the Acoustical Society of America, 100(3).

Hogden, J., Rubin, P., & Saltzman, E. (1996). An unsupervised method for learning to track tongue position from an acoustic signal. Bulletin de la Communication Parlee, 3, 101-116.

Nix, D., Papcun, G., Hogden, J., & Zlokarnik, I. (1996). Two cross-linguistic factors underlying tongue shapes for vowels. Journal of the Acoustical Society of America, 99(6), 3707-3717.

Conference Proceedings (peer reviewed and/or invited talks)

Hogden, J. (2009) A blind algorithm for recovering speech articulator positions from acoustics. Invited presentation to the 43rd Asilomar Conference on Signals, Systems, and Computers. Pacific Grove, CA, Nov. 1-4, paper in preparation.

Hogden, J., Valdez, P., McDermott, E., & Katagiri, S., (2003) Blind inversion of multidimensional functions for speech enhancement, Proceedings of the Eurospeech Conference, Geneva, 1409-1412.

Hogden, J., (2002) The manifold advantages of articulatory representations, including microphone and speaker normalization, Guest Lecture, Johns Hopkins University Speaker Recognition Workshop, http://www.clsp.jhu.edu/ws2002/seminars/lecture_hogden.shtml

Hogden, J., & Valdez, P. (2001, May 21-23). A stochastic articulatory-to-acoustic mapping as a basis for speech recognition. Proceedings of the IEEE Instrumentation and Measurement Technology Conference, Budapest, Hungary.

Valdez, P., Hogden, J., & Jordan, R. (2001, May 20th-24th 2001). Maximum likelihood continuity mapping (MALCOM): An alternative To hidden Markov models for analyzing categorical data sequences. Paper presented at the Society for Industrial and Applied Mathematics (SIAM) Conference on Applications of Dynamical Systems: Minisymposium on Hidden Markov Modeling and Dynamical Systems, Snowbird, Utah, U.S.A. (invited presentation)

Hogden, J., & Valdez, P. (2000, May 1st-4th 2000). Bridging the gap between speech production and speech recognition. Proceedings of the 5th Seminar on Speech Production: Models and Data, Kloster Seeon, Bavaria.

Hogden, J., Nix, D., & Valdez, P. (1999, Sept. 24th - 25th). Maximum likelihood continuity mapping: Bridging the gap between production and recognition. Paper presented at the 9th Hub-5 Conversational Speech Recognition Workshop, Linthicum Heights, Maryland, U.S.A. (invited presentation)

Nix, D., & Hogden, J. (1999). Maximum-Likelihood Continuity Mapping (MALCOM): An Alternative to HMMs. Advances in Neural Information Processing Systems: Proceedings of the 1998 Conference, pages 744-750, MIT Press, Cambridge, Massachusetts, U.S.A.

Hogden, J. (1995). A maximum likelihood approach to estimating speech articulator positions from speech acoustics. Advances in Neural Information Processing: Post-Conference Workshop on Neural Networks for Signal Processing. Vail, Colorado, U.S.A. (invited talk)

Hogden, J., Saltzman, E., & Rubin, P. (1993). Tracking moving objects with unsupervised neural networks. Proceedings of the World Conference on Neural Networks, Portland, Oregon.

Conference Presentations (not including above)

Hogden, J., Fortson, R., Fasel, P. (2005). Image Comparison for Code Validation (U). Presentation to the ASC Predictive Science Panel Committee Meeting, Los Alamos National Laboratory, Los Alamos, NM, October 12-14, LA-CP-05-1005.

Hogden, J., Rubin, P., (2005) Blind Inversion and the Perception/Production Link, Acoust. Soc. America Conference (LA-UR-05-3028). Los Alamos National Laboratory, Los Alamos, NM.

Hogden, J., Brewer, R., (2005). Improvements on Blind Inversion of PINEX Data (U), Presentation to JOWOG-32M, Los Alamos National Laboratory, Los Alamos, NM, September 26-30, 2005, LA-CP-05-0990

Hogden, J., Brewer, R., (2004). Blind Inversion of PINEX Data (U), Presentation to JOWOG-32M, AWE, Aldermaston, Great Britain, May 17-21, 2004. LA-CP-04-0366

Cannon, M. T., Hogden, J., Warnock, T., Fasel, P. K., Fortson, R., (2004) Statistical methods for analysis and anomaly detection in large hydrocode data sets, Presented at the Nuclear Explosives Code Developer Conference (NECDC 2004), Lawrence Livermore National Laboratory, Livermore, CA.

Hogden, J., Cannon, T. M., Baron, M., (2003) Making inferences from PINEX data (U). Proceeding of the Nuclear Explosives Design Physics Conference. Los Alamos National Laboratory, Los Alamos, NM. LA-CP-03-0529.

Hogden, J., Nix, D., Gracco, V., Rubin, P., (1998). Stochastic word models for articulatorily constrained speech recognition and synthesis. The Journal of the Acoustical Society of America, 100(4 pt. 2), 2663.

Hogden, J. (1996). A maximum likelihood approach to estimating speech articulator positions from speech acoustics. The Journal of the Acoustical Society of America, 100(4 pt. 2), 2663 (A).

Hogden, J., & Heard, M. (1995). Evaluating a topographical mapping from speech acoustics to tongue positions. Journal of the Acoustics Society of America, 97(5 pt. 2), 3401(A).

Hogden, J., Lofquist, A., Gracco, V., Oshima, K., Rubin, P., & Saltzman, E. (1993). Inferring articulator positions from acoustics: an electromagnetic midsagittal articulometer experiment. Journal of the Acoustical Society of America, 94(3), 1764(A).

Hogden, J., Saltzman, E., & Rubin, P. (1992). Unsupervised neural networks that use a continuity constraint to track articulators. Journal of the Acoustical Society of America, 92(4), 2477 (A).

Hogden, J., Rubin, P., & Saltzman, E. (1992). An unsupervised method for learning to track tongue position from an acoustic signal. Journal of the Acoustical Society of America, 91(4), 2443 (A).

Technical Reports & other:

Kelly, P. Fasel, P. Hogden, J., Howse, J., Fortson, R., (2006). Towards automated threshold selection for hydrocode simulation imagery (LA-UR-06-3899). Los Alamos National Laboratory, Los Alamos, NM.

Cannon, M., Coker, R., Fisher, K., Fortson, R., Hogden, J., Warnock, T., Wilde, B. Kamm, J., Perry, T., Rosen, P., (2005) Image Quantification of Experiments and Simulations of Laser-Driven Supersonic Jets, LA-UR-05-1441. Los Alamos National Laboratory, Los Alamos, NM.

Hogden, J. (Mar, 2003) Speech Production-Based Recognition: Final Report On NTT/LANL Speech Joint Research Activities (LA-CP-03-0217). Los Alamos National Laboratory, Los Alamos, NM.

Hogden, J. (Aug, 2002). Highly Constrained Bandwidth Combinational Algorithm For Transmission Of Speech(Hc-Bats) (LA-UR-02-4965). Los Alamos National Laboratory, Los Alamos, NM.

Fasel, P. K., Fortson, R., Hogden, J., Cannon, M. T., (2001). FEEMADS: Extracting features from hydrocode output. LA-UR-01-6597. Los Alamos National Laboratory, Los Alamos, NM.

Cannon, M. T., Fasel, P. K., Fortson, R., Hogden, J., Hush, D.R., Kelly, P. M., Rivenburgh, R. D., Strelitz, R., (2000) Asymmetry detectors for hydrocode simulation outputs. LA-UR-00-5203. Los Alamos National Laboratory, Los Alamos, NM.

Hogden, J., Nix, D., & Valdez, P. (1998). Phase 1 Final Report: An Articulatorily Constrained, Maximum Likelihood Approach to Speech Recognition (LA-UR 98-5638). Los Alamos National Laboratory, Los Alamos, NM.

Hogden, J., & Scovel, J. (1998). MALCOM X: Combining maximum likelihood continuity mapping with Gaussian mixture models (LA-UR -98-1378). Los Alamos National Laboratory, Los Alamos, NM.

Bobbitt, N., Fortson, R., Hogden, J., Kantor, M., Marathe, A., Roberts, T., Scovel, J.C., Warnock, T., White, J., (1998), Knowledge Discovery in Large Data Sets (LA-CP-98-0069). Los Alamos National Laboratory, Los Alamos, NM.

Hogden, J. (1997a). Maximum likelihood continuity mapping for fraud detection (LA-UR 97-992). Los Alamos National Laboratory. Los Alamos, N.M.

Hogden, J. (1997b). Modeling words with subword units in an articulatorily constrained speech recognition algorithm (LA-UR 97-4848). Los Alamos National Laboratory. Los Alamos, NM.

Hogden, J., Papcun, G., Zlokarnik, I., Nix, D., (1997). Analysis of Wolves & Sheep — Final Report. (LA-UR-97-2001) Los Alamos National Laboratory. Los Alamos, NM.

Hogden, J. (1996a). Articulatorily constrained, maximum entropy approach to speech recognition and speech coding (LA-UR-96-3519). Los Alamos National Laboratory. Los Alamos, NM.

Hogden, J. (1996b). Improving on hidden Markov models: An articulatorily constrained, maximum likelihood approach to speech recognition and speech coding (unclassified LA-UR-96-3945). Los Alamos National Laboratory. Los Alamos, NM.

Hogden, J. (1996c). A maximum likelihood approach to estimating articulator positions from speech acoustics (LA-UR-96-3518). Los Alamos National Laboratory. Los Alamos, NM.

Hogden. (1991). Low-dimensional phoneme mapping using a continuity constraint. Unpublished Doctoral Dissertation, Stanford University, Stanford, CA.