

Curriculum Vitae

Garrison W. Cottrell

Education

Cornell University, Ithaca, NY	B.S.	1972	Mathematics and Sociology
Cornell University, Ithaca, NY	M.A.T.	1975	Mathematics Education
University of Rochester, Rochester, NY	MS	1981	Computer Science
University of Rochester, Rochester, NY	Ph.D.	1985	Computer Science
University of California, San Diego	Postdoc	1985-1987	Cognitive Science

Employment

NIMH Postdoc (w/D.E. Rumelhart)	Psych Dept. UCSD	1985–1987
Assistant Professor	CSE Dept. UCSD	1987–1993
Associate Professor	CSE Dept. UCSD	1993–1997
Full Professor	CSE Dept. UCSD	1997–Present
Director, Interdisciplinary Ph.D. Program in Cognitive Science	UCSD	2000–Present
Director, Vision and Learning in Humans and Machines Program (IGERT)	UCSD	2003–2007
Director, Temporal Dynamics of Learning Center (an NSF Science of Learning Center)	UCSD	2007–present

Professional Activities

Action Editor, *Neural Computation* (1995-Present), Associate Editor, *Connection Science* (1989-Present), Program Chair, Eighteenth Annual Conference of the Cognitive Science Society (1996) Cognitive Science Area Chair, Neural Information Processing Systems (1993,1999), Advisory Board, Institute for Neural Computation (UCSD), (1989–Present), Advisory Board, Center for Research in Language (UCSD) (2000-2004), numerous Program committees.

Recent Grants

A hierarchical approach to unsupervised feature discovery			
NSF	\$400,000	09/15/2012 – 09/14/2015	PI
UCSD-Howard Pathways for Graduate Success			
UC Office of the President	\$288,450	12/03/2012 – 12/02/2015	PI
Interactions Between Visual and Auditory Interventions for Reading			
Dept. of Education	\$2,372,289	03/01/2010 - 02/28/2014	PI

REU Site: The Temporal Dynamics of Learning Center
NSF **\$594,243** 09/01/2010-08/31/2016 PI

The Temporal Dynamics of Learning Center
NSF **\$33,500,000** 09/15/2006-09/30/2016 PI

Publications

Cottrell, G., Small, S. (1983) "A connectionist scheme for modelling word sense disambiguation." *Cognition and Brain Theory* 6 1983. (pp. 89-120)

Lockery, S.R., Wittenberg, G., Kristan, W., Cottrell, G.W. (1989) "Function of identified interneurons in the leech elucidated using networks trained by back-propagation." *Nature*, 340. (pp. 468-471)

Hare, M., Corina, D., Cottrell, G.W. (1988) "A connectionist perspective on prosodic structure." *Newsletter of the Center for Research in Language*, University of California, San Diego, Vol. 3, No. 2, November.

Cottrell, G.W. (1993) Tsung, Fu-Sheng. "Learning simple arithmetic procedures." *Connection Science*, Vol. 5, No. 1. (pp. 37-58)

Biafore, S., Cottrell, G.W., Focht, L., Kaufman, K., Wyatt, M., and Sutherland, D. (1991) "Neural network analysis of gait dynamics." *Journal of Bone and Joint Surgery*.

Metcalf, J., Cottrell, G.W., and Mencl, W.E. (1992) "Cognitive Binding: A computational-modeling analysis of the distinction between implicit and explicit memory systems." *Journal of Cognitive Neuroscience*, 4. (pp. 289-298)

Cottrell, G.W., Nguyen, M., and Tsung, F-S. (1993) "Dynamic Rate Adaptation." *Artificial Intelligence Review*, Vol. 7. (pp. 271-283)

Cottrell, G.W. (1993) "From symbols to neurons: Are we there yet?" Commentary on Shastri, L. and Ajjanagadde, V., "A connectionist representation of rules, variables, and dynamic bindings using temporal synchrony." *Behavior and Brain Sciences*, 16. (p. 454)

Nguyen, M.H. and Cottrell, G.W. (1994) "A Connectionist Approach to Rate Adaptation." In *SIGART Bulletin*, Vol.5, No. 3. (pp. 29-35)

Valentin, D., Abdi, H., O'Toole, A.J. and Cottrell, G.W. (1994) "Connectionist Models of Face Processing: A Survey." *Pattern Recognition*, (pp. 1-22)

Bartell, B.T., Cottrell, G.W. and Belew, R.K. (1995) "Representing Documents Using an Explicit Model of Their Similarities." *Journal of the American Society for Information Science* 46 (4).

Cottrell, G.W. and Plunkett, K. (1995) "Acquiring the Mapping from Meanings to Sounds." *Connection Science* 6(4). (pp. 379-412).

Plutowski, M., Cottrell, G.W. and White, H. (1996) "Experience with Selecting Exemplars From Clean Data." *Neural Networks* 9:2. (pp. 273-294).

Tsung, F-S. & Cottrell, G.W. (1995) "Learning in recurrent finite difference networks." *International Journal of Neural Systems* 6:249-256.

Clouse, D.C., Giles, C.L., Home, B.G., and Cottrell, G.W. "Time-delay neural networks: Representation and induction of finite state machines." *IEEE Transactions on Neural Networks*.

- Nguyen, M.H. and Cottrell, G.W. "Tau Net: A neural network for modeling temporal variability." *Neurocomputing*.
Bartell, Brian, T., Cottrell, Garrison W. and Richard K. Belew. (1998) Optimizing similarity using multi-query relevance feedback. *Journal of the American Society for Information Science* 49(8):742-761.
- Dailey, Matthew N. and Cottrell, Garrison W. (1999) Organization of face and object recognition in modular neural network models. *Neural Networks*. 12(7-8) :1053-1074
- Vogt, Christopher C. and Cottrell, Garrison W. (1999) Fusion via a linear combination of scores. *Information Retrieval*. 1(3) : 151-173
- Laakso, Aarre and Cottrell, Garrison W. (2000) Content and cluster analysis: Assessing representational similarity in neural systems. *Philosophical Psychology*. 13(1): 46-76.
- Taylor AL, Kristan WB, and Cottrell, GW. (2000) A model of the leech segmental swim central pattern generator. *Neurocomputing* Vol. 32-33, pp. 573-584.
- Taylor, Adam L., Cottrell, Garrison W., and Kristan, William B. Jr. (2001) Analysis of oscillations in a reciprocally inhibitory network with synaptic depression. *Neural Computation*, 4(3):561-581.
- Dailey, Matthew N., Cottrell, Garrison W., Padgett, Curtis, and Adolphs, Ralph. (2002) EMPATH: A neural network that categorizes facial expressions. *Journal of Cognitive Neuroscience*, 14(8): 1158-1173.
- Rossion, B., Joyce, C.A., Cottrell, G.W., and Tarr, M.J. (2003). "Early lateralization and orientation tuning for face, word, and object processing in the visual cortex." *Neuroimage* 20(3): 1609-1624.
- Taylor, AL, Cottrell, G.W., Kleinfeld, D., and Kristan, W.B. Jr. (2003). "Imaging reveals synaptic targets of a swim-terminating neuron in the leech CNS." *Journal of Neuroscience*, 23, pp. 11402-11410.
- Smith, Marie L., Cottrell, G.W., Gosselin, Frederic, and Schyns, Phillippe G. (2005). "Transmitting and Decoding Facial Expressions, *Psychological Science*, 16 (3): 184-189.
- Nelson, Jonathan, and Cottrell, G.W. (2007) "A probabilistic model of eye movements in concept formation." *Neurocomputing*.70(13-15):2256-2272.
- Joyce, Carrie A., Schyns, Philippe G., Gosselin, Frederic, Cottrell, Garrison W., and Bruno Rossion (2006) Early selection of diagnostic facial information in the human visual cortex. *Vision Research*. 46(6-7): 800-813.
- Inazawa, H. and Cottrell, Garrison W. (2006) Phase space learning in an autonomous dynamical neural network. *Neurocomputing*, 69(16-18):2340-2345.
- Cottrell, Garrison W. (2006) New life for neural networks. *Science*, 313(5786):454-5.
- Tong, Matthew H., Bickert, Adam D., Christiansen, Eric M., Cottrell, Garrison W. (2007) Learning grammatical structure with Echo State Networks. *Neural Networks* 20(3):424-432.
- McCleery, J.P., Zhang, L., Ge, L., Wang, Z., Christiansen, E.M., Lee, K. and Cottrell, G.W. (2008) The roles of visual expertise and visual input in the face inversion effect: Behavioral and neurocomputational evidence. *Vision Research* 48:703-715.
- Tong, M.H., Joyce, C.A., and Cottrell, G.W. (2008) Why is the fusiform face area recruited for novel categories of expertise? A neurocomputational investigation *Brain Research* 1202:14-24.
- Hsiao, J. and Cottrell, G.W.(2008) Two fixations suffice in face recognition. *Psychological Science*. 19(10): 998-1006

- Hsiao, J., Shieh, D. X. and Cottrell, G.W. (2008) Convergence of the visual field split: Hemispheric modeling of face and object recognition. *Journal of Cognitive Neuroscience*. **20**(12):2298-2307.
- Zhang, Lingyun, Tong, Matthew H., Marks, Tim K., Shan, Honghao, and Cottrell, Garrison W. (2008). SUN: A Bayesian Framework for Saliency Using Natural Statistics and digits. *Journal of Vision*. **8**(7):32, 1-20.
- Barrington, Luke, Marks, Tim K., Hsiao, Janet Hui-wen, and Cottrell, Garrison W. (2008) NIMBLE: A Kernel Density Model of Saccade-Based Visual Memory. *Journal of Vision*. **8**(14):17, 1-14.
- Hsiao, Janet, and Cottrell, Garrison W. (2009) Not all expertise is holistic, but it may be leftist: The case of Chinese character recognition. *Psychological Science* **20**(4):455-63.
- Kanan, C.M., Tong, M.H., Zhang, L. and Cottrell, G.W. (2009). SUN: Top-down saliency using natural statistics. *Visual Cognition* **17**, Issue 6 & 7 pp. 979-1003 (Special Issue on eye guidance in natural scenes (B. Tatler, Ed.)).
- Marks, T.K., Howard, A., Bajracharya, M., Cottrell, G.W. and Matthies, L. (2009) Gamma-SLAM: Visual SLAM in unstructured environments using variance grid maps. *Journal of Field Robotics* **26**(1):26–51
- Flowe, Heather and Cottrell, Garrison W. (2010) An examination of simultaneous lineup identification decision processes using eye tracking. *Applied Cognitive Psychology* published online 14 MAY 2010 DOI: 10.1002/acp.1711
- Nelson, Jonathan, McKenzie, Craig, Cottrell, Garrison, and Sejnowski, Terrence (2010) Experience Matters: information acquisition optimizes probability gain. *Psychological Science* **21**(7):960-969.
- Dailey, Matthew N. Joyce, Carrie A., Lyons, Michael J., Kamachi, Miyuki, Ishi, Hanae, Gyoba, Jiro, and Cottrell, Garrison W. (2010). Evidence and a computational explanation of cultural differences in facial expression recognition. *Emotion* **10**(6):874-893.
- Kanan, Christopher and Cottrell, Garrison W. (2012) Color-to-Grayscale: Does the method matter in image recognition? *PLoS ONE* **7**(1): e29740. doi:10.1371/journal.pone.0029740
- Yan, Linjun, Elgamal, Ahmed, and Cottrell, Garrison W. (2013). A sub-structure vibration NARX neural network approach for statistical damage inference. *Journal of Engineering Mechanics* **139**(6):737-747. (Special Issue on Dynamics and Analysis of Large-Scale Structures).
- Hsiao, Janet H., Cipollini, Ben, and Cottrell, Garrison W. (2013) Hemispheric asymmetry in perception: A differential encoding account. *Journal of Cognitive Neuroscience* **25**(7):998-1007.
- Cowell, Rosemary A. and Cottrell, G.W. ([early access](#), Posted Online July 16, 2013) What evidence supports special processing for faces? A cautionary tale for fMRI interpretation. *Journal of Cognitive Neuroscience*.

Papers in Refereed Conferences

- Small, S., Cottrell, G., Shastri, L. (1982) "Toward connectionist parsing." *Proceedings of the National Conference on Artificial Intelligence*, Pittsburgh, PA, Aug. 18-20. (pp. 247-250)
- Cottrell, G. (1984) "A model of lexical access of ambiguous words." *Proceedings of the National Conference on Artificial Intelligence*, Austin, TX, Aug. 6-10. (pp. 61-67) One of twelve papers nominated for the AAAI Publisher's Prize.
- Cottrell, G. (1984) "Re: On inheritance hierarchies with exceptions." *Proceedings of the Workshop on Non-Monotonic Reasoning*, New Paltz, NY, Oct. 17-19. (pp. 33-56)
- Cottrell, G. (1985) "Connectionist parsing." *Proceedings of the Seventh Annual Cognitive Science Society Conference*, Irvine, CA, Aug. 15-17. (pp. 201-211)

Cottrell, G. (1985) "Parallelism in inheritance hierarchies with exceptions." *Proceedings of the Ninth International Joint Conference on Artificial Intelligence*, Los Angeles, CA, Aug. 18-23. (pp. 194-202)

Cottrell, G. (1985) "Implications of connectionist parsing for aphasia." *Proceedings of the Ninth Annual Symposium on Computer Applications in Medical Care*, Baltimore, MD, Aug. 18-23. (pp. 237-241)

Cottrell, G. (1987) "Toward connectionist semantics." Invited paper in *Theoretical Issues in Natural Language Processing-3: Position Papers*, Las Cruces, NM, Jan. 7-9. (See Item 9B.) (pp. 65-70)

Cottrell, G., Munro, P. and Zipser, D. (1987) "Learning internal representations from gray-scale images: An example of extensional programming." *Proceedings of the Ninth Annual Cognitive Science Society Conference*, Seattle, WA, July 16-18. (pp. 461-473)

Cottrell, G.W. and Willen, D. (1988) "Image compression with visual system constraints." *Proceedings of the 1st Annual meeting of the International Neural Network Society*, Cambridge, MA. (1 page)

Cottrell, G. (1988) "Analysis of image compression by back propagation." *Proceedings of the Workshop on Neural Architectures for Computer Vision at AAAI-88*, Minneapolis, MN. (6 pages)

Cottrell, G.W. and Munro, P. (1988) "Principal components analysis of images via back propagation." Invited paper in *Proceedings of the Society of Photo-Optical Instrumentation Engineers*, Cambridge, MA. (pp. 1070-1077)

Tsung, Fu-Sheng, Cottrell, G.W. (1989) "A sequential adder using recurrent networks." *Proceedings of the International Joint Conference on Neural Networks*, Washington, DC, January.

Cottrell, G.W., Tsung, Fu-Sheng. (1989) "Learning simple arithmetic procedures." *Proceedings of the Eleventh Annual Cognitive Science Society Conference*, Ann Arbor, MI. (pp. 58-65)

Hare, M., Corina, D., Cottrell, G.W. (1989) "A connectionist perspective on prosodic structure." *Proceedings of the Fifteenth Meeting of the Berkeley Linguistic Society*. (pp. 4-19)

Tsung, Fu-Sheng, Cottrell, G.W., Selverston, A.I. (1990) "Some experiments on learning stable network oscillations." *Proceedings of the International Joint Conference on Neural Networks*, San Diego, CA, June. Ann Arbor, MI: IEEE Neural Network Council. (Vol.1, pp. 169-174)

Fleming, M.K., Cottrell, G.W. (1990) "Categorization of faces using unsupervised feature extraction." *Proceedings of the International Joint Conference on Neural Networks*, San Diego, CA, June. Ann Arbor, MI: IEEE Neural Network Council. (Vol.2, pp. 65-70)

Cottrell, G.W., Fleming, M.K. (1990) "Face recognition using unsupervised feature extraction." *Proceedings of the International Neural Network Conference*, Paris, France, Dordrecht: Kluwer, July. (pp. 322-325)

Cottrell, G.W., Bartell, B., Haupt, C. (1990) "Grounding meaning in perception." H. Marburger (Ed.) *Proceedings of the Fourteenth German Workshop on AI*, Berlin: Springer Verlag, September 10-14. (pp. 307-321)

Cottrell, G.W. (1990) "Extracting features from faces using compression networks." Touretzky, D.S., Elman, J.L., Sejnowski, T.J. and Hinton, G.E. (Eds.) *Proceedings of the 1990 Connectionist Models Summer School*, San Mateo: Morgan Kaufman. (pp. 328-337)

Bartell, B., and Cottrell, G.W. (1991) "A model of symbol grounding in a temporal environment." In *Proceedings of the International Joint Conference on Neural Networks*, Seattle, WA, June.

Bartell, B., Cottrell, G.W., and Elman, J. (1991) "The role of input and target similarity in assimilation." In *Proceedings of the Thirteenth Annual Cognitive Science Society Conference*, Chicago, IL.

Cottrell, G.W., Metcalfe, J. (1991) "EMPATH: face, gender and emotion recognition using holons." D. Touretzky (Ed.) *Advances in Neural Information Processing Systems 3*, San Mateo: Morgan Kaufmann. (pp. 564-571)

Cottrell, G.W., and Plunkett, K. (1991) "Learning the past tense in a recurrent network: Acquiring the mapping from meanings to sounds." In *Proceedings of the Thirteenth Annual Cognitive Science Society Conference*, Chicago, IL.

Cottrell, G.W., Tsung, F-S, and Nguyen, M. (1992) "Dynamic Rate Adaptation." Invited paper in the preprints of the *First Swedish National Conference on Connectionism*, University of Skovde, Skovde, Sweden.

Bartell, B.T., Cottrell, G.W., and Belew, R.K. (1992) "Latent Semantic Indexing is an Optimal Special Case of Multidimensional Scaling." In *Proceedings of Special Interest Group on Information Retrieval*, Copenhagen, Denmark, ACM Press publishers.

Tsung, F.S. and Cottrell, G.W. (1993) "Hopf Bifurcation and Hopf-Hopping in Recurrent Nets." In *Proceedings of the IEEE International Conference on Neural Networks*, San Francisco, March 28-April 1.

DeMers, D., and Cottrell, G.W. (1993) "Nonlinear dimensionality reduction." *Advances in Neural Information Processing Systems 5*, San Mateo, CA, Morgan Kaufmann publishers.

Nguyen, M.H. and Cottrell, G.W. (1993) "A technique for adapting to speech rate." In Kamm, Kuhn, Yoon, Chellappa, and Kung (Eds.) *Proceedings of the IEEE Workshop on Neural Networks for Signal Processing*, New York:IEEE Press. (pp.382-391)

Cottrell, G.W., Nguyen, M.H., and Tsung, F.S. (1993) "Tau Net: The way to do is to be." In *Proceedings of the Fifteenth Annual Conference of the Cognitive Science Society Conference*, Boulder, Colorado, June 18-21. Hillsdale, New Jersey: Lawrence Erlbaum Associates. (pp.365-370)

Tsung, F.S. and Cottrell, G.W. (1993) "Learning Temporal Signals in Phase Space." In *Proceedings of the 1993 International Symposium on Nonlinear Theory and its Applications*, Honolulu, Hawaii, December 5-10. (pp. 1027-1032)

Bartell, B.T., Cottrell, G.W. and Belew, R.K. (1994) "Optimizing Parameters in a Ranked Retrieval System Using Multi-Query Relevance Feedback." In *Proceedings of the Symposium on Document Analysis and Information Retrieval*, Las Vegas, Nevada, April. (pp. 95-102)

Plutowski, M.E., Cottrell, G.W., and White, H. (1994) "Learning Mackey Glass from 25 examples, plus or minus 2." Cowan, Tesauro, and Alspector (Eds.) In *Advances in Neural Information Processing Systems 6*. San Mateo, CA. Morgan Kaufmann Publishers.

Bartell, B.T., Cottrell, G.W. and Belew, R.K. (1994) "Automatic Combination of Multiple Ranked Retrieval Systems." In *Proceedings of Special Interest Group on Information Retrieval*, Dublin, Ireland: ACM Press. (pp.173-181)

Noelle, D.C. and Cottrell, G.W. (1994) "Integrating Induction & Instruction: Connectionist Advice Taking." In *Proceedings of The Twelfth National Conference On Artificial Intelligence (AAAI-94)*, Menlo Park: AAAI Press. (p. 1481)

Bartell, B., Cottrell, G.W. and Belew, R. (1995) "Learning to Retrieve Information." In Niklasson, Lars and Mikael Boden (Eds.) *Current trends in connectionism: Proceedings of the Swedish Conference on Connectionism -1995*, LEA: Hillsdale.

Tsung, F.S. and Cottrell, G.W. (1995) "Phase-Space Learning." G.Tesauro, D.S. Touretzky and T.K. Leen (Eds.) *Advances in Neural Information Processing Systems 7*, MIT Press: Cambridge, MA.

Noelle, D., and Cottrell, G.W. (1995) "A connectionist model of instruction following." In *Proceedings of the Seventeenth Annual Cognitive Science Society Conference*, Pittsburgh, PA, Mahwah: Lawrence Erlbaum. (pp. 369-374)

Yamada, K. and Cottrell, G.W. (1995) "A model of scan paths applied to face recognition." In *Proceedings of the Seventeenth Annual Cognitive Science Society Conference*, Pittsburgh, PA, Mahwah: Lawrence Erlbaum. (pp. 55-60)

Jackson, D., Constandse, R.M. and Cottrell, G.W. (1996) "Selective Attention in the Acquisition of the Past Tense." In *Proceedings of the Eighteenth Annual Cognitive Science Society Conference*, San Diego, CA., Mahwah: Lawrence Erlbaum. (pp. 183-188)

Padgett, C., Cottrell, G.W. and Adolphs, R. (1996) "Categorical Perception in Facial Emotion Classification." In *Proceedings of the Eighteenth Annual Cognitive Science Society Conference*, San Diego, CA, Mahwah: Lawrence Erlbaum, 1996. (pp. 249-253)

Clouse, D.S. and Cottrell, G.W. (1996) "Discrete Multi-Dimensional Scaling." In *Proceedings of the Eighteenth Annual Cognitive Science Society Conference*, San Diego, CA, Mahwah: Lawrence Erlbaum, 1996. (pp. 290-294)

Noelle, D.C. and Cottrell, G.W. (1996) "In Search of Articulated Attractors." In *Proceedings of the Eighteenth Annual Cognitive Science Society Conference*, San Diego, CA, Mahwah: Lawrence Erlbaum, 1996. (pp. 329-334)

Noelle, D.C. and Cottrell, G.W. (1996) "Modeling Interference Effects in Instructed Category Learning." In *Proceedings of the Eighteenth Annual Cognitive Science Society Conference*, San Diego, CA, Mahwah: Lawrence Erlbaum. (pp. 475-483)

Dailey, Matthew N., Cottrell, Garrison W. and Padgett, Curtis (1997) A mixture of experts model exhibiting prosopagnosia. In *Proceedings of the Nineteenth Annual Cognitive Science Society Conference*, pp. 155-160. Stanford, CA, Mahwah: Lawrence Erlbaum.

Clouse, D.C., Giles, C., Home, B. and Cottrell, G.W. (1997) "Representation and induction of finite state machines using time-delay neural networks." *Advances in Neural Information Processing Systems 9*, MIT Press: Cambridge, MA.

Padgett, C., and Cottrell, G.W. (1997) "Representing Face Images for Emotion Classification." *Advances in Neural Information Processing Systems 9*, MIT Press: Cambridge, MA.

Jackson, Dan and Cottrell, Garrison W., (1997) Attention and U-shaped learning in the acquisition of the past tense. In *Proceedings of the Nineteenth Annual Cognitive Science Society Conference*, pp. 325-330. Stanford, Ca, Mahwah: Lawrence Erlbaum.

Vogt, Christopher C., Cottrell, Garrison W., Belew, Richard K., and Bartell, Brian T. (1997) Using relevance to train a linear mixture of experts. In Donna K. Harman (ed.), *The Proceedings of the Fifth Text Retrieval Conference (TREC-5)*, National Institute of Standards and Technology, Gaithersberg, MD. , NIST Special Publication, pp. 503-515.

Dailey, Matthew N., Cottrell, Garrison W. (1998) Task and spatial frequency effects on face specialization, *Advances in Neural Information Processing Systems 10*, pp.17-23, MIT Press: Cambridge, MA.

Milostan, Jeanne C. and Cottrell, Garrison W. (1998) Serial Order in Reading Aloud: Connectionist Models and Neighborhood Structure, *Advances in Neural Information Processing Systems 10*, MIT Press, Cambridge, MA.

Anderson, Karen, Milostan, Jeanne C and Cottrell, Garrison W. (1998) Assessing the contribution of representation to results. In *Proceedings of the Twentieth Annual Cognitive Science Society Conference*, Madison, WI, Lawrence Erlbaum, Mahwah, NJ, pp. 48-53.

Clouse, Daniel S. and Cottrell, Garrison W. (1998) Regularities in a Random Mapping from Orthography to Semantics. In *Proceedings of the Twentieth Annual Cognitive Science Society Conference*, Madison, WI, Lawrence Erlbaum, Mahwah, NJ, pp 238-543.

Dailey, Matthew N., Cottrell, Garrison W. and Busey, Thomas A. (1998) Eigenfaces for familiarity. In *Proceedings of the Twentieth Annual Cognitive Science Society Conference*, Madison, WI, Lawrence Erlbaum, Mahwah, NJ, pp. 273-278.

Laakso, Aarre and Cottrell, Garrison W. (1998) How can I know what You think?: Assessing representational similarity in neural systems. In *Proceedings of the Twentieth Annual Cognitive Science Society Conference*, (pp. 273-278), Madison, WI, Lawrence Erlbaum, Mahwah, NJ, pp. 591-596.

Padgett, Curtis and Cottrell, Garrison W. (1998) A simple neural network models categorical perception of facial expressions. In *Proceedings of the Twentieth Annual Cognitive Science Society Conference*, Madison, WI Lawrence Erlbaum, Mahwah, NJ, pp. 806-811.

Vogt, Christopher C. and Cottrell, Garrison W. (1998) Fusion via linear combination for the routing problem. In Donna K. Harmon (Ed.), *The Proceedings of the Sixth Text Retrieval Conference (TREC-6)*, National Institute of Standards and Technology, Gaithersburg, MD., NIST Special Publication, 500-240.

Vogt, Christopher C. and Cottrell, Garrison W. (1998) Predicting the performance of linearly combined IR systems. In *Proceedings of Special Interest Group on Information Retrieval*, (pp. 190-196), Melbourne.

Vogt, Christopher C., Cottrell, Garrison W., Belew, Richard K. and Bartell, Brian T. (1999) User Lenses-Achieving 100% Precision on Frequently Asked Questions In *User Modeling: Proceedings of the Seventh International Conference*, Banff, (pp. 87-96). Springer: New York.

Morris, William C. and Cottrell, Garrison W. (1999) The Empirical Acquisition of Grammatical Relations. In Martin Hahn and Scott C. Stoness (Eds.), *Proceedings of the 21st Annual Cognitive Science Society Conference*, Vancouver, BC, Canada. Lawrence Erlbaum, Mahwah, NJ. pp. 438-443.

Dailey, Matthew N., Cottrell, Garrison W. and Busey, Thomas A. (1999). Facial memory is kernel density estimation (almost). In M.S. Kearns, S.A. Solla and D.A. Cohn, (eds.), *Advances in Neural Information Processing Systems 11*, (pp.24-30). Cambridge, MA: MIT Press.

Taylor, A. L., Kristan, W. B. and Cottrell, Garrison W. (1999) A model of the leech segmental swim central pattern generator. *Computational Neuroscience: Trends in research 1999*.

Dailey, M.N., Cottrell, G.W., & Adolphs, R. (2000), A six-unit network is all you need to discover happiness. In *Proceedings of the 22nd Annual Cognitive Science Society Conference, Philadelphia, PA*, pp. 101-106, Lawrence Erlbaum: Mahwah, NJ.

Milostan, Jeanne C., Cottrell, Garrison W. and Ferreira, Victor (2000) Neighborhood and position effects interact in naming latency. In *Proceedings of the 22nd Annual Cognitive Science Society Conference, Philadelphia, PA*, pp. 353-357, Lawrence Erlbaum: Mahwah, NJ.

Noelle, David C. and Cottrell, Garrison W. (2000) Individual differences in exemplar-based interference during instructed category learning. In *Proceedings of the 22nd Annual Cognitive Science Society Conference, Philadelphia, PA*, pp. 358-363, Lawrence Erlbaum: Mahwah, NJ.

Munro, Paul and Cottrell, Garrison W. (2001) Interactions between frequency effects and Age of Acquisition effects in a connectionist network. In *Proceedings of the 23rd Annual Cognitive Science Society Conference*, pp. 675-680. Edinburgh, Scotland, Lawrence Erlbaum: Mahwah, NJ.

Anderson, Karen L. and Cottrell, Garrison W. (2001) Age of acquisition in connectionist networks. In *Proceedings of the 23rd Annual Cognitive Science Society Conference*, pp. 27-32. Edinburgh, Scotland, Lawrence Erlbaum: Mahwah, NJ.

Sugimoto, Maki and Cottrell, Garrison W. (2001) Visual expertise is a general skill. In *Proceedings of the 23rd Annual Cognitive Science Society Conference*, pp. 994-999. Edinburgh, Scotland, Lawrence Erlbaum: Mahwah, NJ.

Smith, Mark A., Cottrell, Garrison W. and Anderson, Karen L. (2001) The early word catches the weights. In *Advances in Neural Information Processing Systems 13*, pp. 52-58. MIT Press, Cambridge, MA.

Cottrell, Garrison W., Branson, Kristin and Andrew J. Calder (2002) Do expression and identity need separate representations? In *Proceedings of the 24th Annual Cognitive Science Society Conference*, Fairfax, Virginia, Mahwah: Lawrence Erlbaum, pp: 238-243.

Weiwiora, Eric, Cottrell, G.W. and Elkan, Charles (2003), "Principled Methods for Advising reinforcement learning agents." In *Proceedings of the Twentieth International Conference on Machine Learning (ICML-2003)*, Tom Fawcett and Nina Mishra (Eds.), pp. 792-799, Washington, DC: AAAI Press.

Joyce, Carrie A., and Cottrell, G.W. (2004). Solving the visual expertise mystery. *Connectionist Models of Cognition and Perception II: Proceedings of the Eighth Neural Computation and Psychology Workshop*, Howard Bowman and Christophe Labiouse (Eds.), World Scientific.

Zhang, Lingyun, and Cottrell, G.W. (2004). When holistic processing is not enough: Local features save the day. In *Proceedings of the 26th Annual Cognitive Science Society Conference*, Chicago, Illinois. Mahwah: Lawrence Erlbaum, pp. 1506-1511.

Tran, Brian, Joyce, Carrie A., and Cottrell, G.W. (2004). Visual expertise depends on how you slice the space. In *Proceedings of the 26th Annual Cognitive Science Society Conference*, Chicago, Illinois. Mahwah: Lawrence Erlbaum. pp. 1345-1350. (talk: 32% acceptance rate)

Tong, Matthew H., Joyce, Carrie A., and Cottrell, G.W. (2005). Are Greebles special? Or, why the Fusiform Fish Area (if we had one) would be recruited for sword expertise. In *Proceedings of the 27th Annual Cognitive Science Society Conference*, La Stresa, Italy. Mahwah: Lawrence Erlbaum. *Winner of the 2005 Marr Prize for best student paper*, pp. 2196-2201. (talk: 26% acceptance rate)

Haque, AfmZakaria, and Cottrell, G.W. (2005). Modeling the Other Race Advantage. In *Proceedings of the 27th Annual Cognitive Science Society Conference*, La Stresa, Italy. Mahwah: Lawrence Erlbaum, pp. 899-904.

Lake, Brenden M., and Cottrell, G.W. (2005). Age of Acquisition in Facial Identification: A connectionist approach. In *Proceedings of the 27th Annual Cognitive Science Society Conference*, La Stresa, Italy. Mahwah: Lawrence Erlbaum, pp. 1236-1241. (talk: 26% acceptance rate)

Nguyen, Nam, and Cottrell, G.W. (2005). "Owls and Wading Birds: Generalization gradients in expertise." In *Proceedings of the 27th Annual Cognitive Science Society Conference*, La Stresa, Italy. Mahwah: Lawrence Erlbaum, pp. 1636-1641.

Zhang, Lingyun, and Cottrell, G.W. (2005). Holistic processing develops because it is good. In *Proceedings of the 27th Annual Cognitive Science Society Conference*, La Stresa, Italy. Mahwah: Lawrence Erlbaum, pp. 2428-2433.

Dollar, P., Rabaud, V., Cottrell, G.W., and Belongie, S. (2005). "Behavior Recognition via sparse spatio-temporal features." In *Proceedings of the Joint IEEE Workshop on Visual Surveillance and Performance Evaluation of Tracking and Surveillance (VS-PETS)*, Beijing, China.

Barrington, Luke and Garrison W. Cottrell (2006) Automatic visual integration: Defragmenting the face. In *Proceedings of the 28th Annual Cognitive Science Society Conference*, Vancouver, BC, Canada. Mahwah: Lawrence Erlbaum. (talk: acceptance rate 28%)

Zhang, Lingyun and Garrison Cottrell (2006) Look Ma! No network: PCA of gabor filters models the development of face discrimination. In *Proceedings of the 28th Annual Cognitive Science Society Conference*, Vancouver, BC, Canada. Mahwah: Lawrence Erlbaum.

- Shan, Honghao, Zhang, Lingyun and Garrison W. Cottrell (2007) Recursive ICA. In B. Scholkopf, J. Platt and T. Hoffman (Eds.) *Advances in Neural Information Processing Systems* 19, pp 1273-1280. Cambridge: MIT Press. (acceptance rate 28%)
- Barrington, Luke, Marks, Tim, and Cottrell, Garrison W. (2007) NIMBLE: a kernel density model of saccade-based visual memory. In *Proceedings of the 29th Annual Cognitive Science Society Conference*, Nashville, TN. Mahwah: Lawrence Erlbaum. (talk: acceptance rate 30%)
- Hsiao, Janet, and Cottrell, Garrison W. (2007) Computational explorations of split architecture in modeling face and object recognition. In *Proceedings of the 29th Annual Cognitive Science Society Conference*, Nashville, TN. Mahwah: Lawrence Erlbaum. (talk: acceptance rate 30%)
- Zhang, Lingyun, Tong, Matthew H., and Cottrell, Garrison W. (2007) Information attracts attention: A probabilistic account of the cross-race advantage in visual search. In *Proceedings of the 29th Annual Cognitive Science Society Conference*, Nashville, TN. Mahwah: Lawrence Erlbaum. (talk: acceptance rate 30%)
- Marks, T.K., Howard, A., Bajracharya, M., Cottrell, G.W. and Matthies, L. (2008) Gamma-SLAM: Using stereo vision and variance grid maps for SLAM in unstructured environments. In *International Conference on Robotics and Automation (ICRA) 2008*.
- Butko, N.J., Zhang, L. Cottrell, G.W. and Movellan, J.R. (2008) Visual saliency model for robot cameras. In *International Conference on Robotics and Automation (ICRA) 2008*.
- Shan, H. and Cottrell, G.W. (2008) Looking around the back yard helps the recognition of faces and digits. In *Computer Vision and Pattern Recognition (CVPR) 2008* (poster presentation, acceptance rate 32%) .
- Hsiao, Janet, Shabbazi, Reza, and Cottrell, Garrison W. (2008) Hemispheric asymmetry in visual perception arises from differential encoding beyond the sensory level. In *Proceedings of the 30th Annual Cognitive Science Society Conference*, Washington, D.C. Mahwah: Lawrence Erlbaum. (talk: acceptance rate 30%)
- Hsiao, Janet and Cottrell, Garrison W. (2009) What is the cause of left hemisphere lateralization of English visual word recognition? Pre-existing language lateralization, or task characteristics? In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 881-886). Austin, TX: Cognitive Science Society. (Poster presentation: Acceptance rate 72%)
- Zhang, L., Tong, M.H., and Cottrell, G.W. (2009) SUNDAY: Saliency Using Natural Statistics for Dynamic Analysis of Scenes. In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 2944-2949). Austin, TX: Cognitive Science Society. (Poster presentation: Acceptance rate 72%)
- Cowell, R.A., Huber, D. and Cottrell, G.W. (2009) Virtual Brain Reading: A Connectionist Approach to Understanding fMRI. In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 212-217). Austin, TX: Cognitive Science Society. (Oral presentation: acceptance rate 33%). *Winner of the 2009 Perception/Action Modeling Prize*.
- Kanan, C.M., and Cottrell, G.W. (2010) Robust classification of objects, faces, and flowers using natural image statistics. In *Computer Vision and Pattern Recognition (CVPR) 2010 pp. 1-8*. (acceptance rate 27%).
- Li, Rentao and Cottrell, Garrison W. (2012) A new angle on the EMPATH model: Spatial frequency orientation in recognition of facial expressions. In N. Miyake, D. Peebles, & R. P. Cooper (Eds.), *Proceedings of the 34th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- Yang, Ruixin and Cottrell, Garrison W. (2012) The influence of risk aversion on visual decision making. In N. Miyake, D. Peebles, & R. P. Cooper (Eds.), *Proceedings of the 34th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Tsuchida, Tomoki and Cottrell, Garrison W. (2012) Auditory saliency using natural statistics. In N. Miyake, D. Peebles, & R. P. Cooper (Eds.), *Proceedings of the 34th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Cipollini, Benjamin, Hsiao, Janet H-W., and Cottrell, Garrison W. (2012) Connectivity asymmetry can explain visual hemispheric asymmetries in local/global, face, and spatial frequency processing. In N. Miyake, D. Peebles, & R. P. Cooper (Eds.), *Proceedings of the 34th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Omigbodun, A. and Cottrell, G.W. (2013) Is facial expression processing holistic? In *Proceedings of the 35th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Wang, P. and Cottrell, G.W. (2013) A computational model of the development of hemispheric asymmetry of face processing. In *Proceedings of the 35th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Cipollini, B. and Cottrell, G.W. (2013) Uniquely human developmental timing may drive cerebral lateralization and interhemispheric coupling. In *Proceedings of the 35th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Books and Book Chapters

Cottrell, G., Small, S. (1984) "Viewing parsing as word sense discrimination: A connectionist approach." In B. Bara and G. Guida (Eds.), *Computational Models of Natural Language Processing*, Amsterdam: North Holland. (pp. 91-119)

Small, S., Cottrell, G. and Tanenhaus, M. (Eds.) (1988) "Lexical ambiguity resolution: Perspectives from psycholinguistics, neuropsychology, and artificial intelligence." *Perspectives from Artificial Intelligence, Psychology and Neurolinguistics*, San Mateo: Morgan Kaufman. (518 pages)

Cottrell, G.W. (1989) *A connectionist approach to word sense disambiguation*. London: Pitman Publishers, Ltd..

Kristan, W.B., Jr., Lockery, S.R., Wittenberg, G., Cottrell, G.W. (1989) "Behavioural choice - in theory and in practice." R. Durbin, C. Miall, and G. Mitchison (Eds.) *The Computing Neuron*, Wokingham, England: Addison Wesley. (pp. 180-204)

Cottrell, G.W., Munro, P., Zipser, D. (1989) "Image compression by back propagation: A demonstration of extensional programming." Noel Sharkey (Ed.) *Models of Cognition*, Norwood: Ablex. (pp. 208-240).

Cottrell, G.W. (1989) "Toward connectionist semantics." In Yorick Wilks (Ed.) *Theoretical Issues in Natural Language Processing*. Hillsdale: Lawrence Erlbaum. (pp.64-72)

Cottrell, G.W., Tsung, Fu-Sheng. (1991) "Learning simple arithmetic procedures." J. Barnden and J. Pollack (Eds.) *Advances in Connectionist and Neural Computation Theory*, Vol. 1: High-Level Connectionist Models, Norwood, N.J.: Ablex Publishing Corp.

Cottrell, G.W., Nguyen, M., and Tsung, F-S. (1994) "Dynamic Rate Adaptation." L.F.Niklasson and M.B. Boden (Eds.) In *Connectionism in a Broad Perspective*, Ellis Horwood Publishers. (pp. 123-138).

Metcalf, J., Mencl, W.E. and Cottrell, G.W. (1994) "Cognitive Binding." D.L. Schacter and E. Tulving (Eds.) *Memory Systems*, Cambridge, MA: MIT Press. (pp. 369-394)

Noelle, D. and Cottrell, G.W. (1996) "Towards Instructable Connectionist Systems." In Sun and Bookman (Eds.) *Computational Architectures Integrating Neural and Symbolic Processes*, Dordrecht:Kluwer. (pp. 198-221) October 15.

Cottrell, G.W. (Ed.) (1996) *Proceedings of the Eighteenth Annual Cognitive Science Conference*, San Diego, CA, Mahwah: Lawrence Erlbaum.

Dailey, M. N. and Cottrell, Garrison W. (1999) Prosopagnosia in modular neural network models. To appear in J. Reggia, E. Ruppin and Glanzman, D. (Eds.), *Neural Models of Brain and Cognitive Disorders*. (Elsevier's Progress in Brain Research series, Vol. 121). pp. 165-184.

Morris, William C., Cottrell, Garrison W. and Elman, Jeffrey L. (2000) A Connectionist Simulation of the Empirical Acquisition of Grammatical Relations. In Stefan Wermter and Ron Sun (Eds.), *Hybrid Neural Symbolic Integration*, Springer-Verlag. pp. 175-193.

Cottrell, Garrison, W., Dailey, Matthew, N., Padgett, Curtis, Adolphs, Ralph (2001) Is all face processing holistic? In M. Wenger and J. Townsend (Eds.), *Computational, Geometric, and Process Perspectives on Facial Cognition: Contexts and challenges*. Lawrence Erlbaum Assoc: Mahwah, NJ. pp. 347-395

Laakso, A., and Cottrell, G.W. (2006). "Churchland on Connectionism." In B.L. Keely (Ed.), *Paul Churchland*. Cambridge, UK: Cambridge University Press.

Palmeri, T. and Cottrell, G.W. (2009) Modeling Perceptual Expertise. In Isabel Gauthier, Michael J. Tarr, and Daniel Bub, (Eds.) *Perceptual Expertise*, Oxford: Oxford University Press.

Cottrell, G.W. and Hsiao, J.H. (2011) Neurocomputational Models of Face Processing. In A.J. Calder, G. Rhodes, M. Johnson, and J. Haxby (Eds.) *The Oxford Handbook of Face Perception*. Oxford, UK: Oxford University Press.

Other papers

Cottrell, G.W. (1993) "Connectionist approaches to natural language processing." In *Encyclopaedia of Language and Linguistics*, Pergamon Press/Aberdeen University Press. (pp. 698-706)

Ash, T. and Cottrell, G.W. (1995) "Topology-modifying neural network algorithms." Michael Arbib (Ed.) *Handbook of Brain Theory and Neural Networks*. MIT Press.

Cottrell, G.W. (2003) "Attractor Networks" In Lyn Nadel (Ed.) *Encyclopedia of Cognitive Science*, London: Nature Publishing Group, pp. 253 – 262.

Zhang, Lingyun, and Cottrell, G.W. (2004). "Four blobs: Y or face?" In *Proceedings of the 2004 International Conference on Development and Learning*, La Jolla, Ca, October, 2004.

Zhang, Lingyun, and Cottrell, G.W. (2005). "A computational model which learns to selectively attend in category learning." In *Proceedings of the 2005 International Conference on Development and Learning*, Osaka, Japan.

Anderson, Karen A. and Cottrell, G.W. (2004) "Measured Age of Acquisition effects in quasi-regular domains. (Abstract) In *Proceedings of the 2004 Cognitive Neuroscience Conference (Journal of Cognitive Neuroscience supplement)*. One of eight selected for the "Graduate Students Present" forum.

Nelson, JD; Cottrell, GW; Movellan, JR (2004). "Explaining eye movements during learning as an active sampling process." *Proceedings of the 2004 International Conference on Development and Learning*, La Jolla, Ca, October, 2004.

Marks Tim K., Howard, Andrew, Bajracharya, Max, Cottrell, Garrison W., and Matthies, Larry (2007) Gamma-SLAM: Stereo visual SLAM in unstructured environments using variance grid maps. In the *Workshop on Visual SLAM - An Emerging Technology* at the 2007 IEEE International Conference on Intelligent Robots and Systems, San Diego, CA.