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Curriculum Vitae
Kenneth J. Hayworth, Ph.D.

EDUCATION

2009	Ph.D.	Neuroscience	Univ. of Southern California
1997	B.S.	Computer Science & Engineering	Univ. of California, Los Angeles
1997	B.S.	Mathematics	Univ. of California, Los Angeles

EXPERIENCE

2005- Present Researcher on Harvard University's Automatic Tape-Collecting Lathe Ultramicrotome (ATLUM) Project

2003 – 2009 Research Assistant - Enrolled in the Neuroscience Graduate Program at the University of Southern California

2005 – 2008 Co-Principle Investigator on McKnight grant for the "Development of an Automatic Tape-collecting Lathe Ultramicrotome for Large Scale Brain Reconstruction"

1999 – 2003 Research Engineer (Micro Devices Laboratory) at NASA's Jet Propulsion Laboratory in Pasadena, CA

1997 – 1998 Research Engineer (Neural Networks Group) at NASA's Jet Propulsion Laboratory in Pasadena, CA

1994 – 1997 Engineering Associate, Ennex Fabrication Technologies in Los Angeles, CA

AWARDS & ACCOMPLISHMENTS

Awarded research grant from the McKnight Endowment Fund for Neuroscience
Outstanding Research Award – USC Neuroscience Graduate Program (2008)
Awarded Neuroscience Fellowship USC
JPL NOVA award for technical contributions to the microgyroscope program

JOURNAL ARTICLES

Hayworth, K. J., Lescroat, M. D., Biederman, I. 2009. The neural coding of explicit relations. (submitted)

Kim, J.G., Biederman, I., Lescroat, M. D., Hayworth, K.J. 2009. Adaptation to objects in the lateral occipital complex (LOC): Shape or semantics? *Vision Research* (in press)

Hayworth, K. J., Biederman, I. 2006. Neural evidence for intermediate representations in object recognition. *Vision Research* 46(23): 4024-4031.

INVITED TALKS

Hayworth, K. J. 2008 Automated creation and SEM imaging of Ultrathin Section Libraries. Invited lecture in the High-Throughput Microscopy in the Analysis of Neural Circuits Symposium at the Society of Neuroscience conference. November, 2008 Washington D.C.

Hayworth, K. J. 2008 High-throughput ultrathin sectioning and electron microscopic imaging for tracing synaptic circuits. Invited lecture at the Whole Brain Emulation Workshop. May 26-27, 2007 Oxford, UK

Hayworth, K. J., Kasthuri, N., Schalek, R. and Lichtman, J. W. 2006. Automating the Collection of Ultrathin Serial Sections for Large Volume TEM Reconstructions. Invited lecture at the Microscopy and Microanalysis conference. Chicago 2006

OTHER PUBLICATIONS AND PRESENTATIONS

Hayworth, K. J., Lescroart, M., Kim, J, and Biederman, I. 2009 Evidence for Object File Encoding in the Posterior Fusiform Gyrus (pFs) and the Intraparietal Sulcus (IPS). Poster to be presented at Vision Sciences Society conference in Naples, Florida May 2009

Hayworth, K. J., Lescroart, M., and Biederman, I. 2008 Explicit relation coding in the Lateral Occipital Complex. Poster presented at Vision Sciences Society conference in Naples, Florida May 2008

Hayworth, K. J., Lescroart, M., and Biederman, I. 2007. Sensitivity to Object-Centered Relations in LOC. Poster presented at Vision Sciences Society conference in Sarasota, Florida May 2007

Hayworth, K. J., Yue, X., and Biederman, I. 2007. Some tests of the standard model. Poster presented at Vision Sciences Society conference in Sarasota, Florida May 2007

Hayworth, K. J., Yue, X., Lescroart, M., and Biederman, I. 2006. A lateral occipital complex (LOC) localizer with precisely matched local feature composition in intact and scrambled images. Poster presented at the Vision Sciences Society conference in Sarasota, Florida May 2006

Biederman, I., Hayworth, K. J. 2005. fMRIa to complementary, contour-deleted images of objects. Poster presented at the Vision Sciences Society conference in Sarasota, Florida May 6 - 11, 2005

Hayworth, K. J., Biederman, I. 2005. Differential fMRI activity produced by variations in parts and relations during object perception. Poster presented at the Vision Sciences Society conference in Sarasota, Florida May 6 - 11, 2005

Hayworth, K. J. 2005. Automatic taping lathe-microtome. Proceedings of the Southern California Society for Microscopy and Microanalysis, April 1, 2005

Bae, S. Y., Hayworth, K. J., Shcheglov, K. V. 2005. Split Resonator Integrated Post MEMS Gyroscope. NASA Tech Briefs, February 2005

Biederman, I., Hayworth, K. J. 2004. Neural fMRI Signatures for Variation in Parts and Relations during Object Perception Paper presentation at the Society for Neuroscience Conference October 23-27, 2004 in San Diego, CA

Hayworth, K. J., Biederman, I. 2004. Parts and Relations are analyzable Sources of Shape Variation: Evidence for Structural Descriptions. Journal of Vision, 4(8), 98a, http://journalofvision.org/4/8/98/, doi:10.1167/4.8.98.

Hayworth, K. J. 2003. Continuous Tuning and Calibration of Vibratory Gyroscopes. NASA Tech Briefs October 2003

Hayworth, K. J. 2002. Single Brain Physical Slice Library Proposal: Creating a Complete Human Neural Connectivity Database via Sparse, Automatically-Directed Ultramicroscopic Imaging using an Automated Retrieval Brain Slice Storage System. Unpublished online distribution.

Bae, S. Y., Hayworth, K. J., Shcheglov, K. V., Yee, K. Y., Wiberg, D. V. 2002. MEMS Gyroscope Fabrication, 8-Electrode Tuning, and Performance Results. Solid-State Sensor, Actuator and Microsystems Workshop, Hilton Head Island, South Carolina, June 2002.

Bae, S. Y., Hayworth, K. J., Yee, K. Y., Shcheglov, K. V., Wiberg, D. V. 2002. High-Performance MEMS Microgyroscope. SPIE Proceedings Design, Test, Integration, and Packaging of MEMS/MOEMS. Cannes, France 2002.

Hayworth, K. J. 2001. Switched Drive-Angle Continuously Auto-Tuning, ZRO-Calibrating, and Drift-Compensating MEMS Vibratory Gyroscope IRU. JPL New Technology Report #30449

Hayworth, K. J., Shcheglov, K. V., Humphreys, T., Challoner, D. 2001. Electrostatic Spring Softening Applied to Adjusting Mechanical Modal Frequencies (and Axes) and Mechanical Quality (Q) Factor in Redundant Degree of Freedom Resonators. JPL New Technology Report #30287

Tang, T., Gutierrez, R., Hayworth, K., Evans, C., Podosek, J., Hui, A., Rodger, D., Shcheglov, K. 1999. High Performance Microgyros for Space Applications. AIAA Space Technology Conference, USA, September 28, 1999.

Stoica, A., Keymeulen, D., Lazaro, C., Wei-te, L., Hayworth, K., Tawel, R. 1999. Toward On-board Synthesis and Adaptation of Electronic Functions: An Evolvable

Hardware Approach. Proceedings of 1999 IEEE Aerospace Conference, March 6-13, 1999. Snowmass, Colorado.

Stoica, A., Lazaro, C., Keymeulen, D., Hayworth, K. Evolution of CMOS Circuits in Simulations and Directly in Hardware on a Programmable Chip. Proceedings of Genetic and Evolutionary Computation Conference (GECCO99), July 1999. Orlando, Florida, USA

Hayworth, K. J. 1998. Mechanisms of Human Computation. JPL D-Document D-16371

Hayworth, K. 1998. The 'Modeling Clay' Approach to Bio-inspired Electronic Hardware. Evolvable Systems: From Biology to Hardware: Second International Conference, ICES98 Lausanne, Switzerland, September 23-25, 1998

Thomas, C. L., Hayworth, K. J. 1996. Automating Sheet-Based Fabrication: The Conveyed-Adherent Process. Proceedings of the Solid Freeform Fabrication Symposium, University of Texas at Austin, August 1996

PATENTS

(2008 pending) Methods and apparatus for providing and processing serial tissue sections
(2006 pending) Methods and apparatuses for the automated production, collection, handling, and imaging of large numbers of serial tissue sections
7,437,253 Parametrically disciplined operation of a vibratory gyroscope
7,396,478 Multiple internal seal ring micro-electro-mechanical system vacuum packaging method
7,347,095 Integral resonator gyroscope
7,285,844 Multiple internal seal right micro-electro-mechanical system vacuum package
6,944,931 Method of producing an integral resonator sensor and case
6,915,215 Integrated low power digital gyro control electronics
6,823,734 Electrostatic spring softening in redundant degree of freedom resonators
6,796,179 Split-resonator integrated-post MEMS gyroscope
6,575,218 Method and apparatus for automatic fabrication of three dimensional object
5,879,489 Method and apparatus for automatic fabrication of three-dimensional objects