

Christof Koch

NAME: Christof Koch

April 2007

CITIZENSHIP: USA

POSITION: Lois and Victor Troendle Professor of Cognitive and Behavioral Biology, California Institute of Technology

WEB SITE: <http://www.klab.caltech.edu>



EDUCATION:

Lycée Descartes, Rabat, Morocco, Baccalauréat, 1974

University of Tübingen, Germany, M.S., 1980, Physics

Max-Planck-Institut für biologische Kybernetik, Tübingen, Germany, Ph.D., 1982,
Physics

AWARDS:

1979 Elected as Fellow of the "Studienstiftung des deutschen Volkes"

1980 Master's thesis, magna cum laude

1982 Ph.D., magna cum laude

Christof Koch

- 1982 Awarded postdoctoral fellowship by the Franz Thyssen Foundation
- 1987 Alfred Sloan Research Fellow
- 1987 Office of Naval Research Young Investigator Award
- 1988 NSF Presidential Young Investigator Award
- 1997 Alexander von Humboldt Research Price
- 2000 Lois and Victor Troendle Professor of Cognitive and Behavioral Biology
- 2004 Bernard Osher Fellow at the San Francisco Exploratorium, California
- 2005 J. Robert Oppenheimer Memorial Lecture, Los Alamos, New Mexico
- 2006 Foerster Lecture at University of California, Berkeley

RESEARCH AND PROFESSIONAL EXPERIENCE:

- 1982-1984 **Postdoctoral fellow** at the Massachusetts Institute of Technology
- 1984-1986 **Research Scientist** at the Center for Biological Information Processing at the Massachusetts Institute of Technology
- 1986-1991 **Assistant Professor** of Computation and Neural Systems in the Division of Biology and the Division of Engineering and Applied Sciences at the California Institute of Technology
- 1986 Faculty member at the Institute of Theoretical Physics at the University of California in Santa Barbara
- 1988-1992 Founding director, together with James Bower, of four week summer course *Methods in Computational Neuroscience* at the Marine Biological Laboratory in Woods Hole
- 1991-1993 **Associate Professor** of Computation and Neural Systems
- 1993 **Visiting Professor** in Theoretical Physics at the ETH in Zürich/Switzerland
- 1994-2000 **Full Professor** of Computation and Neural Systems
- 1994- **Adjunct Professor** at the Salk Institute
- 1995 **Visiting Professor** in Theoretical Physics at the ETH in Zürich/Switzerland
- 1994-1998 Founding director, together with Terry Sejnowski, of three week summer course *Neuromorphic Engineering* in Telluride, Colorado
- 1996- 2005 Executive Officer of the Computation and Neural Systems Program at Caltech
- 2000- **Lois and Victor Troendle Professor** of Cognitive & Behavioral Biology.
- 2005 **Visiting Professor** in Theoretical Physics at the ETH in Zürich/Switzerland.
Director, Broad Fellows Program in Brain Circuitry

PhD ADVISOR: Valentin Braitenberg and Tomaso Poggio, Max-Planck Institute for biological Cybernetic, Tübingen, Germany.

Christof Koch

POST-DOCTORAL ADVISOR: Tomaso Poggio, MIT

PHD THESIS ADVISOR TO: Alex Bäcker (Sandia Natl. Lab), Wyeth Bair (Oxford), Ojvind Bernander (Industry), Rainer Deutschmann (U. Munich), John Harris (U. Florida), Reid Harrison (U. Utah), Ching Ho (Industry), Constanze Hofstötter (ETH/Zürich), Gary Holt (Industry), Timothy Horiuchi (U. Maryland), Laurent Itti (USC), Gabriel Kreiman (MIT), Amit Manwani (Industry), Ania Mitros (Industry), Chunhui Mo (McKinsey), Andrew Moore (Industry), Frank Perez (Industry), Rob Peters (USC), Alberto Pesavento (Industry), Lavanya Reddy (Nature Neuroscience), Leila Reddy (MIT), Rahul Sarpeskar (MIT), William Softky (Industry), Theron Stanford (Industry), Adam Strassberg (Stanford Med. School), Humbert Suarez (Industry), Martin Stemmler (Humbolt University, Berlin), Nao Tsuchiya (Caltech), Dirk Walther (Illinois) Jiajun Wen (Industry), Anthony Zador (CSHL).

ERDÖS NUMBER: 3 (through Harel – McElice – Erdős)

EDITORIAL BOARD:

Action/Section Editor or on the Editorial Board for *Neural Computation*, *Neural Networks*, *Journal of Computational Neuroscience*, *Trends in Cognitive Sciences*, *Vision Research*, *Cerebral Cortex*, *Consciousness and Cognition*, *Advances in Consciousness Research*, and *J. Consciousness Studies*.

PROFESSIONAL MEMBERSHIPS:

The Society of Neuroscience, the European Society of Neuroscience, the Institute of Electrical and Electronics Engineers (IEEE), the Association for Research in Vision and Ophthalmology (ARVO), the American Association for Artificial Intelligence (AAAI), the Optical Society of America, the American Association for the Advancement of Science (AAAS) and the New York Academy of Sciences.

PATENTS:

Christof Koch

Harris J and Koch C, "Resistive Fuse" analog hardware for detecting discontinuities in early vision systems. **US Patent No. 5,062,000**; issued on 10/29/91.

Bair W and Koch C, Circuit for detecting discontinuities in light intensity including two independent resistive networks. **US Patent No. 5,086,219**; issued on 2/4/92.

Koch C and Mathur B, Object-Background discrimination using analog VLSI circuit. **US Patent No. 5,440,079**; issued on 8/8/95.

Sarpeshkar R, Kramer J and Koch C, Pulse domain neuromorphic integrated circuit for computing motion. **US Patent No. 5,781,648** issued on 7/14/98; **US Patent No. 6,023,521** issued on 2/8/00; **US Patent No. 6,088,467** issued on 7/11/00. **US Patent No. 6,212,289**; issued on 4/3/01.

Koch C and Itti L., Computation of intrinsic perceptual saliency in visual environments and applications. Submitted to US Patent Office.

Walther D, Rutishauser U, Perona P and Koch C, A system and method for attentional selection. Submitted to US Patent Office.

SINGLE-AUTHORED BOOKS:

Biophysics of Computation: Information Processing in Single Neurons. Koch C, Oxford University Press, 1999.

The Quest for Consciousness: A Neurobiological Approach. Koch C, Roberts and Publishers, Denver, Colorado, 2004. (www.questforconsciousness.com)
Translated into Japanese, French, Spanish, Korean, and German.

EDITED BOOKS:

Visual Attention and Neural Circuits. Braun J, Koch C and Davis J, editors. MIT Press, 2001.

Methods in Neuronal Modeling: From Ions to Networks. Koch C and Segev I, editors. Completely revised second edition. MIT Press, 1998.

Christof Koch

Large-Scale Neuronal Theories of the Brain. Koch C and Davis J, editors. MIT Press, 1994.

Vision Chips: Implementing Vision Algorithms with Analog VLSI Circuits. Koch C and Li H, editors. IEEE Computer Science Press 1994.

Methods in Neuronal Modeling: From Synapses to Networks. Koch C and Segev I, editors. MIT Press, 1989. Paperback edition 1991.

Visual Information Processing: From Neurons to Chips. Mathur B and C Koch C, editors. SPIE Proc Vol. 1473, 1991.

REFEREED PUBLICATIONS:

Koch C, Nonlinear information processing in dendritic trees of arbitrary geometry. Ph.D. thesis, University of Tübingen, 1982. For a summary, see "News & Views: Anatomical logic of retinal nerve cells." *Nature* **303**: 570-571, 1983.

Koch C, Poggio T and Torre V, Retinal ganglion cells: A functional interpretation of dendritic morphology. *Philosophical Trans. Roy. Soc. B* **298**: 227-264, 1982.

Koch C, Poggio T and Torre V, Nonlinear interaction in a dendritic tree: Localization timing and role in information processing. *Proc. National Academy of Science USA* **80**: 2799-2802, 1983.

Koch C and Poggio T, Electrical properties of dendritic spines. *Trends in Neuroscience* **6**: 80-83, 1983.

Koch C and Poggio T, A theoretical analysis of electrical properties of spines. *Proceedings Royal Society B* **218**: 455-477, 1983.

Koch C, Cable theory in neurons with active, linearized membranes. *Biological Cybernetics* **50**: 15-33, 1984.

Koch C and Poggio T, A simple algorithm for solving the cable equation in dendritic trees of arbitrary geometry. *J. Neuroscience Methods* **12**: 303-315, 1985.

Koch C and Poggio T, The biophysical properties of spines as a basis for their electrical function: A comment of Kawato & Tsukahara (1983). *J. Theoretical Biology* **113**: 225-229, 1985.

Poggio T, Torre V and Koch C, Computational vision and regularization theory. *Nature* **317**: 314-319, 1985.

Koch C, Understanding the intrinsic circuitry of the lateral geniculate nucleus: electrical properties of the spine-triad arrangement. *Proc. Royal Society B* **225**: 365-390, 1985.

Christof Koch

- Koch C and Ullman S, Shifts in selective visual attention: towards the underlying neural circuitry. *Human Neurobiology* **4**: 219-227, 1985.
- Poggio T and Koch C, Ill-posed problems in early vision: From computational theory to analog networks. *Proceedings Royal Society B* **226**: 303-323, 1985.
- Koch C, What's in the term connectionist? *Behavior and Brain Science* **9**: 100-101, 1986.
- Koch C, Torre V and Poggio T, Computations in the vertebrate retina: motion discrimination, gain enhancement and differentiation. *Trends Neuroscience* **9**: 204-211, 1986.
- Koch C, Marroquin J and Yuille A, Analog "neuronal" networks in early vision. *Proc. National Academy Science USA* **83**: 4263-4267, 1986.
- Sherman SM and Koch C, The control of retinogeniculate transmission in the mammalian lateral geniculate nucleus. *Exp. Brain Research* **63**: 1-20, 1986.
- Adams PR, Jones, SW, Pennefather P, Brown DA, Koch C and Lancaster B, Slow synaptic transmission in frog sympathetic ganglia. *J. Exp. Biology* **124**: 259-285, 1986.
- Hildreth E and Koch C, The analysis of visual motion: from computational theory to neuronal mechanisms. *Annual Rev. Neuroscience* **10**: 477-533, 1987.
- Poggio T and Koch C, Synapses that compute motion. *Scientific American* **256(5)**: 46-52, 1987.
- Gamble E and Koch C, The dynamics of free calcium in dendritic spines in response to repetitive synaptic input. *Science* **236**: 1311-1315, 1987.
- Grzywacz NM and Koch C, Functional properties of models for direction selectivity in the retina. *Synapse* **1**: 417-434, 1987.
- Koch C, The action of the corticofugal pathway on sensory thalamic nuclei: a hypothesis. *Neuroscience* **23**: 399-406, 1987.
- Ferster D and Koch C, Neuronal connections underlying orientation selectivity in cat visual cortex. *Trends Neuroscience* **10**: 487-492, 1987.
- Hutchinson J, Koch C, Luo J and Mead C. Computing motion using analog and binary resistive networks. *IEEE Computer* **21**: 52-64, 1988.
- Sejnowski T, Koch C and Churchland P, Computational Neuroscience. *Science* **241**: 1299-1306. 1988.
- Wang HT, Mathur B and Koch C, Computing optical flow in the primate visual system. *Neural Computation* **1**: 92-103, 1989.
- Koch C, Seeing chips: Analog VLSI circuits for computer vision. *Neural Computation* **1**: 184-200, 1989.
- Suarez H and Koch C, Linking linear threshold units with quadratic models of motion perception. *Neural Computation* **1**: 318-320, 1989.
- Koch C, Wang HT and Mathur B, Computing motion in the primate visual system. *J. Experimental Biology* **146**: 115-139, 1989.

Christof Koch

- Harris J, Koch C, Staats E and Luo J, Analog hardware for detecting discontinuities in early vision. *International J. Computer Vision* **4**: 211-223, 1990.
- Koch C, Douglas RJ and Wehmeier U, Visibility of synaptically induced conductance changes: Theory and simulations of anatomically characterized cortical pyramidal cells. *J. Neuroscience*, **10**: 1728-1744, 1990.
- Feldman J, Cooper L, Koch C, Lippman R, Rumelhart D, Sabbah D and Waltz D, Connectionist systems. *Annual Rev. Computer Science* **3**: 369-382, 1990.
- Harris JG, Koch C and Luo J, A two-dimensional analog VLSI circuit for detecting discontinuities in early vision. *Science* **248**: 1209-1211, 1990.
- Crick FC and Koch C, Towards a neurobiological theory of consciousness. *Seminar in the Neuroscience* **2**: 263-275, 1990.
- Crick FC and Koch C, Some reflections on visual awareness. In: *Cold Spring Harbour Symp. Quant. Biol.* **55**: 953-962, 1990.
- Zador T, Koch C and Brown T, Biophysical model of a Hebbian Synapse. *Proceedings National Academy of Sciences USA* **87**: 6718-6722, 1990.
- Kulli J and Koch C, Does anesthesia cause loss of consciousness. *Trends in Neuroscience* **14**: 6-10, 1991.
- Battiti R, Amaldi E and Koch C, Computing optical flow across multiple scales: An adaptive coarse-to-fine approach. *Int. J. Computer Vision* **6**: 133-145, 1991.
- Wörgötter F and Koch C, A detailed model of the primary visual pathway in the cat: Comparison of afferent excitatory and intracortical inhibitory connection schemes for orientation selectivity. *J. Neuroscience* **11**: 1959-1979, 1991.
- Wörgötter F, Niebur E and Koch C, Isotropic connections generate functional asymmetrical behavior in visual cortex cells. *J. Neurophysiol.* **66**: 444-459, 1991.
- Bernander Ö, Douglas RJ, Martin KAC and Koch C, Synaptic background activity determines spatial-temporal integration in pyramidal cells. *Proc. National Academy of Sciences USA* **88**: 11569-11573, 1991.
- Niebur E, Schuster HG, Kammen DM and Koch C, Oscillator phase coupling for different two-dimensional network connectivities. *Physical Reviews A* **44**: 6895-6904, 1991.
- Manor Y, Koch C and Segev I, The effect of geometrical irregularities on propagation delay in axonal trees. *Biophysical Journal* **60**: 1424-1437, 1991.
- Koch C and Crick FC, Understanding awareness at the neuronal level. *Behavioral and Brain Sciences* **14**: 683-684, 1991.
- Koch C and Schuster H, A simple network showing burst synchronization without frequency-locking. *Neural Computation* **4**: 211-223, 1992.
- Koch C, Zador A and Brown T, Dendritic spine function: convergence of theory and experimentation. *Science* **256**: 973-974, 1992.

Christof Koch

- Wörgötter F, Niebur E and Koch C, Anisotropic receptive field properties from isotropic connections in visual cortex. *Neural Computation* **4**: 332-340, 1992.
- Crick FC and Koch C, The problem of consciousness. *Scientific American* **267(3)**: 153-159, 1992.
- Softky WR and Koch C, Cortical cells should fire regularly, but do not. *Neural Computation* **4**: 643-646, 1992.
- Horiuchi T, Bair W, Bishofberger B, Lazzaro J and Koch C, Computing motion using analog VLSI Chips: an experimental comparison among different approaches. *International J. Computer Vision* **8(3)**: 203-216, 1992.
- Bower J and Koch C, Experimentalists and Modelers: Can we all just get along? *Trends in Neuroscience* **15**: 458-461, 1992.
- Luo J, Koch C and Mathur B, Figure-Ground segregation using an analog VLSI chip. *IEEE Mirco* **12**: 46-57, 1992.
- Softky WR and Koch C, The highly irregular firing of cortical cells is inconsistent with temporal integration of random EPSP's. *J. Neuroscience* **13**: 334-350, 1993.
- Koch C and Zador A, The function of dendritic spines: Devices subserving biochemical rather than electrical computation. *J. Neuroscience* **13**: 413-422, 1993.
- Koch C, Computational approaches to cognition: The bottom-up view. *Current Opinion in Neurobiology* **3**: 203-208, 1993.
- Niebur E, Koch C and Rosin C, An oscillation-based model for the neuronal basis of attention. *Vision Research* **33**: 2789-2802, 1993.
- Perez F and Koch C, Hue color segmentation determines object boundaries. *International Journal of Computer Vision* **12**: 17-42, 1994.
- Bernander Ö, Koch C and Usher M, The effect of synchronized inputs at the single neuron level. *Neural Computation* **6**: 622-641, 1994.
- Bair W, Koch C, Newsome W and Britten K, Power spectrum analysis of bursting cells in area MT in the behaving monkey. *J. Neuroscience* **14**: 2870-2892, 1994.
- Zador A and Koch C, Linearized models of calcium dynamics: formal equivalence to the cable equation. *J. Neuroscience* **14**: 4705-4715, 1994.
- Niebur E and Koch C, A model for the neuronal implementation of selective visual attention based on temporal correlation among neurons, *J. Computational Neuroscience* **1**: 141-158, 1994.
- Usher M, Stemmler M, Koch C and Olami Z, Network amplification of local fluctuations causes high spike rate variability, fractal firing patterns and oscillatory local field potentials. *Neural Computation* **6**: 795-836, 1994.
- Bernander Ö, Douglas RJ and Koch C, Amplification and linearization of synaptic input to the apical dendrites of cortical pyramidal neurons. *J. Neurophysiology* **72**: 2743-2753, 1994.
- Fahle M and Koch C, Spatial displacement, but not temporal asynchrony, destroys figural binding. *Vision Research* **35**: 491-494, 1995.

Christof Koch

- Crick FC and Koch C, Are we aware of neural activity in primary visual cortex? *Nature* **375**: 121-123, 1995.
- Koch C, Bernander Ö and Douglas RJ, Do neurons have a voltage or a current threshold for action potential initiation. *J. Computational Neuroscience* **2**: 63-82, 1995.
- Douglas RJ, Koch C, Mahowald M, Martin K, and Suarez H, Recurrent excitation in neocortical circuits. *Science* **269**: 981-985, 1995.
- Koch C, Visual Awareness and the Thalamic Intralaminar Nuclei. *Consciousness and Cognition* **4**: 163-166, 1995.
- Crick FC and Koch C, Cortical areas in visual awareness. *Nature* **377**: 294-295, 1995.
- Suarez H, Koch C, and Douglas RJ, Modeling Direction Selectivity of Simple Cells in Striate Visual Cortex Using the Canonical Microcircuit. *J. Neuroscience* **15**: 6700-6719, 1995.
- Crick FC and Koch C, Why neuroscience may be able to explain consciousness. *Scientific American* **273**: 84-85, 1995.
- Gabbiani F and Koch C, Coding of time-varying signals in spike trains of integrate-and-fire neurons. *Neural Computation* **8**: 44-66, 1996.
- Koch C, Rapp M and Segev I, A Brief History of Time (Constants). *Cerebral Cortex* **6**: 93-101, 1996.
- Koch C and Mathur B, Neuromorphic Vision Chips. *IEEE Spectrum* **33 (5)**: 38-46, 1996.
- Koch C and Braun J, Towards the neural correlate of visual awareness. *Current Opinion in Neurobiology* **6**: 158-164, 1996.
- Bair W and Koch C, Temporal precision of spike trains in extrastriate cortex of the behaving monkey. *Neural Computation* **8**: 1185-1198, 1996.
- Holt G, Softky W, Koch C and Douglas RJ, A Comparison of Discharge Variability *In Vitro* and *In Vivo* in Cat Visual Cortex Neurons. *J. Neurophysiology* **75**: 1806-1814, 1996.
- Wessel R, Koch C and Gabbiani F, Coding of time-varying electric field amplitude modulations in a wave-type electric fish. *J. Neurophysiology* **75**: 2280-2293, 1996.
- Sarpeshkar R, Kramer J, Indiveri G and Koch C, Analog VLSI Architectures for Motion Processing: From fundamental limits to system applications. *Proceedings IEEE* **84**: 969-987, 1996.
- Indiveri G, Kramer J and Koch C, System implementations of analog VLSI velocity sensors. *IEEE Micro* **16**: 40-49, 1996.
- Gabbiani F, Metzner W, Wessel R and Koch C, From Information Coding to Information Processing in Weakly Electric Fish. *Nature* **384**: 564-567, 1996.

Christof Koch

- Koch C, and Braun J, On the functional anatomy of visual awareness. *Cold Spring Harbor Symp. Quant. Biol.* **61**: 49-57, 1996.
- Koch C, Computation and the Single Neuron. *Nature* **385**: 207-211, 1997.
- Marsalek P, Koch C, and Maunsell J, On the Relationship between Synaptic Input and Spike Output Jitter in Individual Neurons. *Proc Natl. Acad. Sci. USA* **94**: 735-740, 1997.
- Kramer J, Sarpeshkar R, and Koch C, Pulse-based analog VLSI velocity sensors. *IEEE Transactions on Circuits & Systems: Analog and Digital Signal Processing* **44**: 86-101, 1997.
- Horiuchi T, and Koch C, Floating-gate circuits for adaptation of saccadic eye movement accuracy. *Analog Integrated Circuits & Signal Processing* **13**: 69-78, 1997
- Holt GR and Koch C, Shunting inhibition does not have a Divisive Effect of Firing Rates. *Neural Computation* **9**: 1001-1013, 1997.
- Wen J, Koch C and Braun J, Spatial vision thresholds in the near absence of attention. *Vision Research* **37**: 2409-2418, 1997.
- Crick FC and Koch C, Why is there a hierarchy of visual cortical and thalamic areas: The no-strong loops hypothesis. *Nature* **391**: 245-249, 1998.
- Crick FC and Koch C, Consciousness and Neuroscience. *Cerebral Cortex* **8**: 97-107, 1998.
- Metzner W, Koch C, Wessel R and Gabbiani F, Feature extraction by burst-like spike patterns in multiple sensory maps. *J. Neuroscience* **18**: 2283-2300, 1998.
- Itti L, Koch C and Niebur E, A model of saliency-based visual attention for rapid scene analysis. *IEEE Trans. Pattern Analysis & Machine Intell. (PAMI)* **20**: 1254-1259, 1998.
- Holt GR and Koch C, Electrical interactions via the extracellular potential near cell bodies. *J. computational Neuroscience* **6**: 169-184, 1999.
- Horiuchi T and Koch C, Analog VLSI-based modeling of the primate oculomotor system. *Neural Computation* **11**: 243-266, 1999.
- Lee D, Itti L, Koch C and Braun J, Attention activates winner-take-all competition amongst visual filters. *Nature Neuroscience* **2**: 375-381, 1999.
- Koch C and Laurent G Complexity and the nervous system. *Science* **284**: 96-98, 1999.
- Stemmler M and Koch C, How voltage-dependent conductances can adapt to maximize the information encoded by neuronal firing rate. *Nature Neuroscience* **2**: 521-527, 1999.
- Reinagel P, Godwin D, Sherman SM and Koch C, The encoding of visual information by LGN bursts. *J. Neurophysiology* **81**: 2558-2569, 1999.

- Higgins CM, Deutschmann RA and Koch C, Pulse-based 2-D motion sensors. *IEEE Transactions on Circuits & Systems: II Analog and Digital Signal Processing* **46**: 677-687, 1999.
- Harrison RR and Koch C, An analog VLSI implementation of a visual interneuron: Enhanced sensory processing through biophysical modeling. *Int. J. Neural Systems* **9**: 391-395, 1999.
- Manwani A and Koch C, Detecting and estimating signals in noisy cable structures: I. Neuronal noise sources. *Neural Computation* **11**: 1797-1829, 1999.
- Manwani A and Koch C, Detecting and estimating signals in noisy cable structures: II Information-theoretic analysis. *Neural Computation* **11**: 1831-1873, 1999.
- Shin J, Koch C and Douglas R, Adaptive neural coding dependent on the time-varying statistics of the somatic input current. *Neural Computation* **11**: 1982-2003, 1999.
- Lee DK, Koch C and Braun J, Attentional capacity is undifferentiated: Concurrent discrimination of form, color and motion. *Perception & Psychophysics* **61**: 1241-1255, 1999.
- Itti L., Koch C and Braun J, A quantitative model relating visual neuronal activity to psychophysical thresholds. *Neurocomputing* **26**: 743-748, 1999.
- Shin J. and Koch C, Dynamic range and sensitivity adaptation in a silicon spiking neuron. *IEEE Trans. Neural Networks* **10**: 1232-1238, 1999.
- Harrison RR, and Koch C, A robust analog VLSI motion sensor based on the visual system of the fly. *Autonomous Robots* **7**: 211-224, 1999.
- Itti L. and Koch C, A saliency-based search mechanism for overt and covert shifts of visual attention. *Vision Research* **40**: 1489-1506, 2000.
- Rees G, Friston, K. and Koch C, A direct quantitative relationship between the functional properties of human and macaque V5. *Nature Neuroscience* **3**: 1-8, 2000.
- Kreiman G, Krahe R, Metzner W, Koch C and Gabbiani F, Robustness and variability of neuronal coding by amplitude-sensitive afferents in the weakly electric fish *Eigenmannia*. *J. Neurophysiology* **84**: 189-204, 2000.
- Speck O, Ernst T, Braun J, Koch C, Miller E and Chang L, Gender differences in the functional organization of the brain for working memory. *Neuroreport* **11**: 2581-2585, 2000.
- Kreiman G, Koch C and Fried I, Category-specific visual responses of single neurons in the human medial temporal lobe. *Nature Neuroscience* **3**: 946-951, 2000.
- Harrison RR and Koch C, A silicon implementation of the fly's optomotor control system. *Neural Computation* **12**: 2291-2304, 2000.
- Crick FC and Koch C, The unconscious homunculus. With commentaries by multiple authors. *Neuro-Psychoanalysis* **2**: 3-59, 2000.

Christof Koch

- Itti L, Koch C and Braun J, Revisiting spatial vision: Toward a unifying model. *J. Opt. Soc. Am. A* **17**: 1899-1917, 2000.
- Koch C and Segev I, Single neurons and their role in information processing. *Nature Neuroscience* **3**: 1171-1177, 2000.
- Harrison RR and Koch C, A robust analog VLSI Reichardt motion sensor. *Analog Integr. Circuits & Signal Proc.* **24**: 213-229, 2000.
- Higgins CM and Koch C, A Modular Multi-Chip Neuromorphic Architecture for Real-Time Visual Motion Processing. *Analog Integr. Circuits & Signal Proc.* **24**: 195-211, 2000.
- Kreiman G, Koch C and Fried I, Imagery neurons in the human brain. *Nature* **408**: 357-361, 2000.
- Zenger B, Braun J and Koch C, Attentional effects on contrast detection in the presence of salient distractors. *Vision Research* **40**: 3717-3724, 2000.
- Manwani A and Koch C, Detecting and estimating signals over noisy and unreliable synapses: Information-theoretic analysis *Neural Computation* **13**: 1-22, 2000.
- Steinmetz PN, Manwani A, Koch C, London M and Segev I, Subthreshold voltage noise due to channel fluctuations in active neuronal membranes. *J. comp. Neuroscience.* **9**: 133-148, 2000.
- Itti L, and Koch C, Computational modeling of visual attention. *Nature Neuroscience Reviews* **2**: 194-204, 2001.
- Itti L, and Koch C, Feature combination strategies for saliency-based visual attention systems, *J. Electronic Imaging* **10(1)**: 161-169, 2001.
- Herzog MH, and Koch C, Seeing properties of an invisible object: Feature inheritance and shine-through. *Proc Natl. Acad. Sci. USA* **98**: 4271-5, 2001.
- Koch C and Crick FC, On the zombie within. *Nature* **411**: 893, 2001.
- Herzog MH, Fahle M, and Koch C, Spatial aspects of object formation revealed by a new illusion, shine-through. *Vision Research* **41**: 2325-35, 2001.
- Herzog MH, Koch C and Fahle M, Shine-through: temporal aspects. *Vision Research* **41**: 2337-46, 2001.
- Itti L, Gold C and Koch C, Visual attention and target detection in cluttered, natural scenes. *Optical Engineering* **40**: 1784-93, 2001.
- Herzog MH, Koch C and Fahle M, Switching binding states. *Visual Cognition* **8**: 623-36, 2001.
- Zenger B and Koch C, Flanker Effects in Peripheral Contrast Discrimination: Psychophysics and Modeling. *Vision Research* **41**: 3663-75, 2001.
- Steinmetz PN, Manwani A and Koch C, Variability and coding efficiency of noisy neural spike encoders. *BioSystems* **62**: 87-97, 2001.
- Jovicich J, Peters RJ, Koch C, Braun J, Chang, L and Ernst T, Brain areas specific for attentional load in a motion tracking task. *J. Cognitive Neuroscience* **13**: 1048-58, 2001.

- Chang L, Speck O, Miller EN, Braun A, Jovicich J, Koch C, Itti L and Ernst T, Neural correlates of attention and working memory deficits in HIV patients. *Neurology* **57**: 1001-7, 2001.
- Pesavento A, Horiuchi T, Diorio, C and Koch C, Adaptation of current signals with floating-gate circuits. *Analog Integrated Circuits & Signal Processing* **30**: 137-47, 2002.
- Krahe R, Kreiman G, Gabbiani F, Koch C and Metzner W, Stimulus encoding and feature extraction by multiple sensory neurons. *J. Neuroscience* **22**: 2374-82, 2002.
- Rees G, Kreiman G and Koch C, Neural correlates of consciousness in humans. *Nature Reviews Neuroscience* **3**: 1-11, 2002.
- Kreiman G, Fried I and Koch C, Single-neuron correlates of subjective vision in the human medial temporal lobe. *Proc Natl. Acad. Sci. USA* **99**: 8378-83, 2002.
- Li FF, VanRullen R, Koch C and Perona P, Rapid natural scene categorization in the near absence of attention. *Proc Natl. Acad. Sci. USA* **99**: 9596-601, 2002.
- Gabbiani F, Krapp HG, Koch C and Laurent G, Multiplicative computation in a looming-sensitive neuron. *Nature* **420**: 320-4, 2002.
- Rasche C and Koch C, Recognizing the gist of a visual scene: Possible perceptual and neural mechanisms. *Neurocomputing* **22**: 979-84, 2002.
- Carter RM, Hofstötter C, Tsuchiya N and Koch C, Working memory and fear conditioning. *Proc Natl. Acad. Sci. USA* **100**: 1399-404, 2003.
- VanRullen R and Koch C, Visual selective behavior can be triggered by a feed-forward process. *J. cognitive Neuroscience* **15**: 209-17, 2003.
- Crick FC and Koch C, A framework for consciousness. *Nature Neuroscience* **6**: 119-27, 2003.
- VanRullen R and Koch C, Competition and selection during visual processing of natural scenes and objects. *J. Vision* **3**: 75-85, 2003.
- VanRullen R and Koch C, Is perception discrete or continuous? *Trends Cogn. Sciences* **7**: 207-13, 2003.
- Herzog MH, Parish L, Koch C and Fahle M, Fusion of competing features is not serial. *Vision Research* **43**: 1951-60, 2003.
- Peters RJ, Gabbiani F and Koch C, Human visual object categorization can be described by models with low memory capacity. *Vision Research* **43**: 2265-80, 2003.
- Han CJ, O'Tuathaigh CM, van Trigt L, Quinn JJ, Fanselow MS, Mongeau R, Koch C and Anderson DJ, Trace but not delay fear conditioning requires attention and the anterior cingulate cortex. *Proc Natl. Acad. Sci. USA* **100**: 13087-92 2003.
- VanRullen R, Reddy L and Koch C, Visual search and dual-tasks reveal two distinct attentional resources. *J. cogn. Neurosciences* **16**: 4-14, 2004.

Christof Koch

- Reddy L, Wilken P and Koch C, Face-gender discrimination is possible in the near-absence of attention. *J. Vision* **4**: 106-117, 2004.
- Crick FC, Koch C, Kreiman G and Fried I, Consciousness and Neurosurgery. *Neurosurgery* **55**: 273-282, 2004.
- Koch C, Qualia. *Current Biology* **14**: R496, 2004.
- Gabbiani F, Krapp HG, Hatsopoulos N, Mo C-H, Koch C and Laurent G, Multiplication and stimulus invariance in a looming-sensitive neuron. *J. Physiology (Paris)* **98**: 19-34, 2004.
- Hofstoetter C, Koch C and Kiper D, Absence of visual awareness does not affect the formation of negative afterimages. *Consciousness & Cognition* **13**: 691-708, 2004.
- Mo C-H, Gu M and Koch C, A learning rule for local synaptic interactions between excitation and shunting inhibition. *Neural Computation* **12**: 2507-2532, 2004.
- Diba K, Lester HA and Koch C, Intrinsic noise in cultured hippocampal neurons: Experiment and modeling. *J. Neuroscience* **24**: 9723-33, 2004.
- Moradi F, Koch C and Shimojo S, Face adaptation depends on seeing the face. *Neuron* **45**: 169-75, 2005.
- Jacobson G, Diba K, Yaron-Jakoubovitch A, Oz Y, Koch C, Segev I, and Yarom Y, Subthreshold voltage noise of rat neocortical pyramidal neurons. *J. Physiology* **564**: 145-60, 2005.
- VanRullen R, Reddy L and Koch C, Attention-driven discrete sampling of motion perception. *Proc. Natl. Acad. Sci. USA* **102**: 5291-6, 2005.
- Quian Quiroga R, Reddy L, Kreiman G, Koch C and Fried I, Invariant visual representation by single neurons in the human brain. *Nature* **435**: 1102-7, 2005.
- Crick FC and Koch C, What is the function of the claustrum. *Phil. Trans. Roy. Soc. Lond B* **360**: 1271-19, 2005.
- Peters RJ, Iyer A, Itti L and Koch C, Components of bottom-up gaze allocation in natural images. *Vision Research* **45**: 2397-416, 2005.
- Tsuchiya N and Koch C, Continuous flash suppression reduces negative afterimages. *Nature Neuroscience* **8**: 1096-101, 2005.
- Walther D, Rutishauser U, Koch C and Perona P, Selective visual attention enables learning and recognition of multiple objects in cluttered scenes. *Comp. Vis. Image Understanding* **100**: 41-63, 2005.
- FeiFei L, VanRullen R, Koch C and Perona P, Why does natural scene categorization require little attention? Exploring attentional requirements for natural and synthetic stimuli. *Visual Cognition* **12**: 893-924, 2005.
- Carter RM, O'Doherty JP, Seymour B, Koch C and Dolan RJ, Contingency awareness in human aversive conditioning involves the middle frontal gyrus. *Neuroimage* **29**: 1007-12, 2006.

- VanRullen R, Reddy L and Koch C, The continuous Wagon Wheel Illusion is associated with changes in EEG power around 13 Hz. *J. Neuroscience* **26**: 502-507, 2006.
- Koch C and Hepp K, Quantum mechanics and higher brain functions: Lessons from quantum computation and neurobiology. *Nature* **440**: 61161-2, 2006.
- Diba R, Koch C and Segev I, Spike propagation in dendrites with stochastic ion channels. *J. comp. Neurosci.* **20**: 77-84, 2006.
- Reddy L, Reddy L and Koch C, Face identification in the near-absence of focal attention. *Vision Research* **46**: 2336-43, 2006.
- Gold C, Henze D, Koch C and Buzsaki G, On the origin of the extracellular potential waveform: A modeling study. *J. Neurophysiology* **95**: 3113-28, 2006.
- Tsuchiya N, Koch C, Gilroy LA and Blake R, Depth of interocular suppression associated with continuous flash suppression, flash suppression, and binocular rivalry. *J. Vision* **6(10)**, 2006.
- Waydo S, Kraskov A, Quian Quiroga R, Fried I and Koch C, Sparse representation in the human medial temporal lobe. *J. Neurosci.*, **26**: 10232-4, 2006.
- Reddy L, Quian Quiroga R, Wilken P, Koch C and Fried I, Single neuron correlate of change detection and change blindness in the human medial temporal lobe. *Current Biology* **16**: 2066-72, 2006.
- Einhäuser W, Rutishauser U, Frady EP, Nadler S, König P and Koch C, The Relation of Phase-Noise and Luminance-Contrast to Overt Attention in Complex Visual Stimuli. *J. Vision* **6(11)**: 1148-58, 2006.
- Walther D and Koch C, Modeling attention to salient proto-objects. *Neural Networks* **19**: 1395-407, 2006.
- Koch C and Tsuchiya N, Attention and consciousness: Two distinct brain processes. *Trends Cog. Sci.* **11**: 16-22, 2007.
- Kraskov A, Quian Quiroga R, Reddy L, Fried I and Koch C, Local field potentials and spikes in the human medial temporal lobe are selective to image category. *J. cogn. Neurosci.* **19**: 1-14, 2007.
- Fei-Fei L, Iyer A, Koch C and Perona P, What do we perceive in a glance of a real-world scene. *J. Vision* **7(1)**: 1-29, 2007.
- Einhäuser W, Koch C and Makeig S, The duration of the attentional blink in natural scenes depends on stimulus category. *Vision Res.* **47**: 597-607, 2007.
- Moradi F, Hipp C and Koch C, Activity in visual cortex is modulated by top-down attention locked to reaction time. *J. cogn. Neurosci.* **19**: 331-340, 2007.
- Gold C, Henze DA and Koch C, Using extracellular action potential recordings to constrain compartmental models. *J. comp. Neurosci.* in press.
- Rutishauser U and Koch C, Probabilistic modeling of eye movement data during conjunction search via feature-based attention. *J. Vision*, in press.

CHAPTERS IN BOOKS:

- Koch C and Poggio T, The synaptic veto mechanism: does it underlie direction and orientation selectivity in the visual cortex? In: *Models of the Visual Cortex*. Rose D and Dobson V, eds., pp. 408-419. John Wiley and Sons, 1985.
- Koch C and Poggio T, Biophysics of computational systems: neurons, synapses and membranes. In: *Synaptic Function*. Edelman GM, Gall WE and Cowan WM, eds., pp. 637-697. Neurosciences Research Foundation, John Wiley and Sons, 1987.
- Koch C and Poggio T, Information processing in nerve cells. In: *Encyclopedia of Neuroscience*. Edelman G, ed., pp. 528-531. Birkhauser, Boston, MA, 1987.
- Koch C and Poggio T, Artificial Intelligence. In: *Encyclopedia of Neuroscience*. G. Edelman, ed., pp. 77-80. Birkhauser, Boston, 1987.
- Ullman S and Koch C, Selective visual attention. In: *Encyclopedia of Neuroscience*. Edelman G, ed., pp. 86-87. Birkhauser, Boston, MA, 1987.
- Koch C and Ullman S, Shifts in selective visual attention: towards the underlying neural circuitry. In: *Matters of Intelligence*, Vania L, ed., pp. 115-141. Reidel Co., Holland, 1987.
- Poggio T, Torre V and Koch C, Computational vision and regularization theory. In: *Readings in Computer Vision*, Fischler MA and Firschein O, eds., Morgan Kaufmann Publishers, Los Altos, California, 1987.
- Wehmeier U, Dong D, Koch C and Van Essen D, Modeling the mammalian visual system. In: *Methods in Neuronal Modeling: From Synapses to Networks..* Koch C and Segev I, eds., pp. 335-360. MIT Press, 1989.
- Yamada W, Koch C and Adams P, Multiple channels and calcium dynamics. In: *Methods in Neuronal Modeling: From Synapses to Networks*, Koch C and Segev I, eds., pp. 97-134. MIT Press, 1989.
- Wang HT, Mathur B, Hsu A and Koch C, Computing optical flow in the primate visual system: linking computational theory with perception and physiology. In: *The Computing Neuron*. Durbin R, Miall C and Mitchinson G, eds., pp. 371-392. Addison-Wesley, 1989.
- Harris J, Koch C, Luo J and Wyatt J, Resistive fuses: analog hardware for detecting discontinuities in early vision algorithms. In: *Analog VLSI Implementation of Neural Systems*. Mead C and Ismail M, eds., pp. 27-56. Kluwer Academic Publishers, 1989.
- Koch C Resistive networks for computer vision: a tutorial. In: *An introduction to Neural and Electronic Networks*. Zornetzer SF, Davis JL and Lau C, eds., pp. 293-305. Academic Press, 1990.

Christof Koch

- Wang, H. T., Mathur, B. and Koch C I thought I saw it move: Computing optical flow in the primate visual system. In: *Neuroscience and Connectionist Theory*. Gluck MA and Rumelhart D, eds., pp. 237-266. Erlbaum Lawrence Associates, 1990.
- Koch C Biophysics of computation: toward the mechanisms underlying information processing in single cells. In: *Computational Neuroscience*. Schwartz E, ed., pp. 97-116. MIT Press, Cambridge, MA, 1990.
- Kammen, D., Holmes, P.J. and Koch C Cortical architecture and oscillations in neuronal networks: feedback versus local coupling. In: *Models of Brain Function*. R. M. J. Cotterill, ed., pp. 273-284, Cambridge University Press, 1990.
- Shepherd, G. and Koch C Introduction to synaptic circuits. In: *The Synaptic Organization of the Brain*. G. Shepherd, ed., pp. 3-31, third edition, Oxford University Press, 1990.
- Adams, P. R. and Koch C Peripheral ganglia. In: *The Synaptic Organization of the Brain*. G. Shepherd, ed., pp. 67-87, third edition, Oxford University Press, 1990.
- Sherman, S. M. and Koch C Thalamus. In: *The Synaptic Organization of the Brain*. G. Shepherd, ed., pp. 246-277, third edition, Oxford University Press, 1990.
- Shepherd G and Koch C, Appendix: Dendritic electrotonus and synaptic integration. In: *The Synaptic Organization of the Brain*. G. Shepherd, ed., pp. 439-473, third edition, Oxford University Press, Oxford, 1990.
- Sejnowski TJ, Koch C and Churchland P, Computational neuroscience. In: *Connectionist Modeling and Brain Function: The Developing Interface*. S. J. Hanson and C R. Olson, eds., pp. 5-35, MIT Press, Cambridge, MA, 1990.
- Sejnowski TJ, Churchland PS and Koch C, What is computational neuroscience? In: *Computational Neuroscience*. E. Schwartz, ed., pp. 46-55, MIT Press, Cambridge, MA, 1990.
- Wörgötter F, Niebur E and Koch C, Modeling visual cortex: Hidden anisotropies in an isotropic inhibitory connection scheme. In: *Advanced Neural Computers*. R. Eckmiller, ed., pp. 87-95, Elsevier, Amsterdam, 1990.
- Sejnowski TS, Koch C and Churchland PS, Computational Neuroscience. In: *Neuroscience Year*, supplement to Encyclopedia of Neuroscience, G. Adelman, ed., Birkhauser, Boston, 1990.
- Poggio T, Torre V and Koch C, Computational vision and regularization theory. In: *Image Understanding 1989*. Ullman S and Richards W, eds., pp. 1-18, Ablex, Norwood, New Jersey, 1990.
- Niebur E, Kammen DM and Koch C, Phase-locking in 1-D and 2-D networks of oscillating neurons. In: *Nonlinear Dynamics and Neuronal Networks*. Singer W and Schuster H, eds., pp. 173-204, Vieweg Verlag, Berlin 1991.

Christof Koch

- Koch C and Poggio T, Multiplying with synapses and neurons. In: *Single Neuron Computation*. McKenna T, Davis J and Zornetzer SF, eds., pp. 315-345, Academic Press, Boston 1992.
- Koch C *et al.* Group report: molecular and biophysical mechanisms of information processing. In: *Exploring Brain Functions: Models in Neuroscience*. Poggio T and Glaser DA, eds., Dahlem Workshop 1991, pp. 59-75, John Wiley, New York, 1993.
- Koch C and Crick FC, Some Further Ideas Regarding the Neuronal Basis of Awareness. In: *Large-Scale Neuronal Theories of the Brain*, Koch C and Davis J, eds., pp. 93-110, MIT Press: Cambridge, MA, 1994.
- Koch C, Visual motion: computational analysis, physiology and perception. In: *Handbook of Neuropsychology, Vol 9*. Boller F and Grafman J, eds., pp. 279-296. Elsevier Science: Amsterdam, 1994.
- Koch C, Smart vision chips: an overview. In: *An Introduction to Neural and Electronic Networks, 2. Edition*. Zornetzer SF, Davis JL, Lau C and McKenna T, eds., pp. 315-334. Academic Press, 1995.
- Olshausen BA and Koch C, Selective visual attention. In: *The Handbook of Brain Theory and Neural Networks*, Arbib M, ed., pp. 837-840, MIT Press, 1995.
- Koch C and Bernander Ö, Axonal modeling. In: *The Handbook of Brain Theory and Neural Networks*, Arbib M, ed., pp. 129-134, MIT Press, 1995.
- Softky, W. and Koch C, Single cell models. In: *The Handbook of Brain Theory and Neural Networks*. Arbib M, ed., pp. 879-884, MIT Press, 1995.
- Koch C, Towards the neuronal substrate of visual consciousness. In: *Towards a Science of Consciousness: The First Tucson Discussions and Debates*. Hameroff SR, Kaszniak AW and Scott AC, eds., pp. 247-258. MIT Press, Cambridge, MA, 1996.
- Koch C, Stemmler M, Suarez H and Douglas RJ, Adapting recurrent cortical excitation. In: *Long Term Potentiation, Vol. 3*, Baudry M and Davis J, eds., pp. 351-377. MIT Press: Cambridge, MA, 1996.
- Crick FC and Koch C, Why Neuroscience may be able to explain consciousness." In: *Explaining Consciousness: The Hard Problem*, Shear J, ed., pp. 237-240. MIT Press: Cambridge, MA, 1997.
- Crick FC and Koch C, Towards a Neurobiological Theory of Consciousness. In: *The Nature of Consciousness*, Block N, Flanagan O and Güzeldere G, eds. pp. 277-292. MIT Press: Cambridge, MA, 1997.
- Shepherd G and Koch C, Introduction to synaptic circuits. In: *The Synaptic Organization of the Brain*, Shepherd G, ed., fourth edition, pp. 1-36. Oxford University Press, 1998.

Christof Koch

- Sherman SM and Koch C, Thalamus. In: *The Synaptic Organization of the Brain*, G. Shepherd, ed., fourth edition, pp. 289-328. Oxford University Press, 1998.
- Yamada W, Koch C and Adams P, Multiple channels and calcium dynamics. In: *Methods in Neuronal Modeling: From Synapses to Networks*, Koch C and Segev I., eds., 2. edition, pp. 137-170. MIT Press: Cambridge, MA, 1998.
- Gabbiani F and Koch C, Principles of Spike Train Analysis. In: *Methods in Neuronal Modeling: From Synapses to Networks*, Koch C and Segev I, eds., 2. edition, pp. 313-360. MIT Press: Cambridge, MA, 1998.
- Horiuchi TK and Koch C, Floating-gate circuits for adaptation of saccadic eye movement accuracy. In: *Neuromorphic Systems Engineering: Neural Networks in Silicon*, Lande, T.S., ed., pp. 175-192. Kluwer Academic Publishers: Boston, MA, 1998.
- Niebur E, and Koch C, Computational architectures for attention. In: *The Attentive Brain*. Parasuraman, R., ed., pp. 163-186. MIT Press, Cambridge, MA, 1998.
- Koch C The Neuroanatomy of Visual Consciousness. In: *Advances in Neurology : Vol. 77. Consciousness: At the Frontiers of Neuroscience.* Jasper, H.H., Laurent, D., Castellucci, V.F. and Rossignol, S., eds., pp. 229-243. Lippincott-Raven Publishers, PA, 1998.
- Douglas, R.J., Koch C, Mahowald, M. and Martin, K.A.C The Role of Recurrent Excitation in Neocortical Circuits. In: *Cerebral Cortex, Vol. 13: Models of Cortical Circuits*, Ulinski, P.S., Jones, E.G. and Peters, A., eds., pp. 251-281. Plenum: New York, NY, 1999.
- Ullman, S. and Koch C Selective visual attention. In: *Encyclopedia of Neuroscience*, 2-nd revised edition, G. Adelman and B.H. Smith, eds., pp. 149-151. Elsevier Science, 1999.
- Softky, W. and Koch C Single neuron computation. In: *Encyclopedia of Neuroscience*, 2-nd revised edition, G. Adelman and B.H. Smith, eds., pp. 1863-1868. Elsevier Science, 1999.
- Koch C and Crick FC, The neurobiology of consciousness. In: *The MIT Encyclopedia of the Cognitive Sciences*, Wilson RA and Keil FC, eds., pp. 193-195. MIT Press: Cambridge, MA, 1999.
- Koch C Computing in single neurons. In: *The MIT Encyclopedia of the Cognitive Sciences*, Wilson RA and Keil FC, eds., pp. 1174-176. MIT Press: Cambridge, MA, 1999.
- Stemmler, M., Usher, M. and Koch C Oscillatory local field potentials. In: *Oscillations in Neural Systems*, Levine, D., Brown, V. and Shirey, T., eds. pp. 79-98. Lawrence Erlbaum: Hillsdale, New Jersey, 2000.

Christof Koch

- Koch C and Crick FC, Some Thoughts on Consciousness and Neuroscience. In: *The Cognitive Neurosciences*, 2-nd edition, Gazzaniga MS, ed., pp. 1285-1294. MIT Press, Cambridge, MA, 2000.
- Crick FC and Koch C, The Unconscious Homunculus. In: *The Neural Correlates of Consciousness*, Metzinger T, ed., pp. 103-110. MIT Press, Cambridge, MA, 2000.
- Koch C and Crick FC, The neural basis of consciousness. In: *Intl. Encyclopedia of the Social & Behavioral Sciences*, Smelser N and Baltes P, eds., Vol. 4, pp. 2600-2604. Elsevier, Oxford, United Kingdom, 2001.
- Braun J, Koch C, Lee KD and Itti L, Perceptual consequences of multilevel selection. In: *Visual Attention and Neural Circuits*. Braun, J., Koch C and Davis, J., eds., pp. 215-241. MIT Press, 2001.
- Niebur E, Itti L and Koch C, Modeling Visual Selective Attention. The "Where" Pathway. In: *Models of Neural Networks IV*, Van Hemmen, Cowan and Domany, eds., pp. 247-276. Springer Verlag, New York, New York, 2002.
- Walther D, Itti L, Riesenhuber M, Poggio T, and Koch C Attentional selection for object recognition - A gentle way. In: *Biologically Motivated Computer Vision – Lecture Notes in Computer Science 2525*: 472-479, 2002.
- Koch C and Crick FC, The Neuronal Basis of Visual Consciousness. In: *The Visual Neurosciences*. Chalupa L and Werner JS, eds., pp. 1682-1692. MIT Press: Cambridge, MA, 2004.
- Han CJ, O'Tuathaigh CM, and Koch C, A practical assay for attention in mice. In: *Cognitive Neuroscience of Attention*. Posner MI, ed., pp. 294-312. Guilford Press, New York, NY, 2004.
- Koch C and Crick FC, A Framework for Consciousness. In: *The Cognitive Neurosciences*, 3-nd edition, Gazzaniga MS, editor, pp. 1133-1143. MIT Press, Cambridge, MA, 2004.
- Kreiman G, Fried I, and Koch C, Responses of single neurons in the human brain during flash suppression. In: *Binocular Rivalry*. Alais D. and Blake W, eds., pp. 213-230. MIT Press, Cambridge, MA 2004.
- Billock G, Koch C and Psaltis D, Selective attention as an optimal computational strategy. In: *Neurobiology of Attention*. Itti L, Rees G. and Tsotsos JK, eds., pp. 18-23. Elsevier, Burlington, MA 2005.
- Crick FC and Koch C, Consciousness, the Neural Correlates of. In: *The Oxford Companion to the Mind*. Gregory R, ed., pp. 220-222. 2-nd edition. Oxford University Press: Oxford, United Kingdom, 2005.
- VanRullen R and Koch C, Visual attention and visual awareness. In: *Clinical Neurophysiology Handbook: Disorders of Visual Processing*. Celesia GG, ed., pp. 65-86. Elsevier, Netherlands, 2005.

- Crick FC and Koch C, What are the neuronal correlates of consciousness. In: *Problems in Systems Neuroscience*. van Hemmen L and Sejnowski TJ, eds., pp. 474-490. Oxford University Press: New York, NY, 2006.
- Ma WJ, Hamker F, and Koch C, Neural mechanisms underlying temporal aspects of conscious visual perception. In: *The First Half Second: The Microgenesis and Temporal Dynamics of Unconscious and Conscious Visual Processes*. Ogmen H, and Breitmeyer BG, eds., pp. 275-294. MIT Press, MA, 2006.
- Crick FC and Koch C, A neurobiological framework for consciousness. In: *The Blackwell Companion to Consciousness*. Velmans M and Schneider S, eds., pp. 567-579. Blackwell, Oxford, UK, 2007.

CHAPTERS IN CONFERENCE PROCEEDINGS:

- Koch C, Poggio T and Torre V, Micronetworks in nerve cells. In: *Competition and Cooperation in Neural Nets*. Amari S. and Arbib MA eds., Lecture Notes in Biomathematics, Springer-Verlag, Berlin, 1982.
- Hutchinson JM and Koch C, Simple analog and hybrid networks for surface interpolation. In: *Neural Networks for Computing*,. Denker JS ed., pp. 235-240, American Institute of Physics, New York, 1986.
- Hutchinson JM and Koch C, Reconstruction of piecewise smooth surfaces using simple analog and hybrid networks. In: *Order and Chaos in Non-Linear Physical Systems*. Lundqvist S, March NH, and Tosi M, eds., pp. 447-480, Plenum Press, New York, 1988.
- Koch C, Computing motion in the presence of discontinuities: algorithm and analog networks. In: *Neural Computers*. R. Eckmiller and C von der Malsburg, eds., pp. 101-110, Springer Verlag, Heidelberg, 1988.
- Mathur B, Wang HT and Koch C, Analog VLSI for early vision processes. In: *22nd Asilomar Conf. Signals, Systems & Computers*. Pacific Groove, October 31-November 2, pp. 507-511, IEEE Press, Washington, 1988.
- Koch C, Luo J, Mead C and Hutchinson J, Computing motion using resistive networks. In: *Proc Society of Photo-Optical Instrumentation Engineers*. **882**: 108-113, 1988.
- Koch C, Luo J, Mead C and Hutchinson J, Computing motion using resistive networks. D. Anderson, ed., pp. 412-422, American Institute of Physics, 1988.
- Koch C, Wang HT, Mathur B, Hsu A and Suarez H, Computing optical flow in resistive networks and in the primate visual system. In: *Proc IEEE Workshop on Visual Motion*. IEEE Press, Irvine, March 20-22, pp. 62-72, 1989.
- Bernander Ö and Koch C, Local cross-modality image alignment using unsupervised learning. In: *Computer Vision - ECCV 90, Lecture Notes in Computer Science*. Vol. 427, Faugeras O, ed., pp. 573-575, Springer Verlag, Berlin, 1990.

Christof Koch

- Wörgötter F, Niebur E and Koch C, Modeling visual cortex: Hidden anisotropies in an isotropic inhibitory connection scheme. In: *Advanced Neural Computers*. Eckmiller R, ed., pp. 87-95, Elsevier, Amsterdam, 1990.
- Koch C, Bair W, Harris JG, Horiuchi T, Hsu A and Luo J, Real-time computer vision and robotics using analog VLSI circuits. In: *Advances in Neural Information Processing Systems 2*. Touretzky D, ed., pp. 750-757, Morgan Kaufmann, 1990.
- Mel BW and Koch C, Sigma-Pi learning: On Radial Basis Functions and cortical associative learning. In: *Advances in Neural Information Processing Systems 2*. Touretzky D, ed., pp. 474-481, Morgan Kaufmann, 1990.
- Kammen D, Holmes PJ and Koch C, Collective oscillations in neuronal networks. In: *Advances in Neural Information Processing Systems 2*. Touretzky D, ed., pp. 76-83, Morgan Kaufmann, 1990.
- Heirich A and Koch C, Neuronal signal strength is enhanced by rhythmic firing. In: *Proceedings of the 1990 connectionist models summer school*. Touretzky, D.S., Elman, J.E., Sejnowski, T.J., and Hinton, G.E., eds., Morgan Kaufmann, San Mateo, 369-378, 1990.
- Bair W and Koch C, An analog VLSI chip for finding edges from zero-crossings. In: *Advances in Neural Information Processing Systems 3*. Touretzky, D.S. and Lippman, R., eds., Morgan Kaufmann, San Mateo, pp. 399-405, 1991.
- Horiuchi T, Lazzaro J, Moore A and Koch C, A delay-line based motion detection chip. In: *Advances in Neural Information Processing Systems 3*. Touretzky, D.S. and Lippman, R., eds., Morgan Kaufmann, San Mateo, pp. 406-412, 1991.
- Niebur E, Kammen, DM, Koch C, Ruderman D, and Schuster HG, Phase-coupling in two-dimensional networks of interacting oscillators. In: *Advances in Neural Information Processing Systems 3*, Touretzky, D.S. and Lippman, R., eds., Morgan Kaufmann, San Mateo, pp. 123-129, 1991.
- Wang HT, Mathur B and Koch C, A multiscale adaptive network model of motion computation in primates. In: *Advances in Neural Information Processing Systems 3*, Touretzky, D.S. and Lippman, R., eds., Morgan Kaufmann, San Mateo, pp. 349-355, 1991.
- Koch C, Implementing early vision algorithms in analog hardware. In: *Visual Information Processing: From Neurons to Chips*. Mathur BP and Koch C, eds., Proc SPIE 1473, pp. 2-16, 1991.
- Bair W and Koch C, Real-time motion detection using an analog VLSI zero-crossing chip. In: *Visual Information Processing: From Neurons to Chips*. Mathur BP and Koch C, eds., Proc SPIE 1473, pp. 59-65, 1991.
- Moore A and Koch C, Multiplication-based analog motion detection chip. In: *Visual Information Processing: From Neurons to Chips*, Mathur BP and Koch C, eds., Proc SPIE 1473, pp. 66-75, 1991.

- Mathur BP, Wang HT, Liu S, Koch C and Luo J, Pixel-level data fusion: From algorithm to chip. In: *Visual Information Processing: From Neurons to Chips*. B.P. Mathur and C Koch eds., Proc SPIE 1473, pp. 153-160, 1991.
- Bair W, Koch C, Moore A, Horiuchi T, Bishofberger B and Lazzaro J, Computing motion using analog VLSI vision chips: an experimental comparison among four approaches. *Proc 2. Intl. Conf. Microelectronics for Neural Networks*. Kyrrill & Method Verlag, München, pp. 291-310, 1991.
- Koch C, Moore A, Bair W, Horiuchi T, Bishofberger and Lazzaro J, Computing motion using analog VLSI vision chips: an experimental comparison among four approaches. *IEEE Workshop on Visual Motion*. Princeton, New Jersey, October 1991, pp. 312-324, 1991.
- Koch C, Wang HT, Battiti R, Mathur B and Ziombowski C, An adaptive multi-scale approach for estimating optical flow: computational theory and physiological implementation. *IEEE Workshop on Visual Motion*. Princeton, New Jersey, October 1991, pp. 111-123, 1991.
- Bernander Ö, Koch C and Douglas RJ, Network activity determines spatio-temporal integration in single cells. In: *Advances in Neural Information Processing Systems 4*. Moody JE, Hanson SJ and Lippman R, eds., pp. 43-50, Morgan Kaufmann, San Mateo, 1992.
- Schuster H and Koch C, Burst synchronization without frequency-locking in a completely solvable network model. In: *Advances in Neural Information Processing Systems 4*. Moody JE, Hanson SJ and Lippman R, eds., pp. 117-124, Morgan Kaufmann, San Mateo, 1992.
- Perez F and Koch C, Towards color image segmentation in analog VLSI. In: *Rockwell Intl. 4. Annual Control-Systems and Signal Processing Conference*. pp. 246-263, January 1992, Anaheim, 1992.
- Koch C, Mathur B, Liu S-C, Harris JG, Luo J and Sivilotti M, Object-based analog VLSI vision circuits. In: *Proc Intelligent Vehicles '92 Symp*. Masaki I, ed., pp. 74-78, 1992.
- Softky W and Koch C, Cortical cells do not perform temporal integration of small EPSPs. In: *Second Workshop on Neural Networks: From Biology to High Energy Physics. Intl. J. Neural Systems, (Suppl.)* 169-176, 1993.
- Koch C, Mathur B, Liu S-C, Harris JG, Luo J, and Sivilotti M, Object-based analog VLSI vision circuits. In: *Advances in Neural Information Processing Systems 5*. Hanson SJ, Cowan J, and Giles L, eds., pp. 828-835, Morgan Kaufmann, San Mateo, 1993.
- Sarpeshkar R, Bair W and Koch C, An analog VLSI chip for local velocity estimation based on Reichardt's motion algorithm. In: *Advances in Neural Information Processing Systems 5*. Hanson SJ, Cowan J and Giles L, eds., pp. 781-788, Morgan Kaufmann, San Mateo, 1993.

- Suarez H, Koch C and Douglas RJ, A model of direction selectivity in visual cortex using massive intracortical connections. In: *Computation and Neural Systems* 92. Eeckman F, ed., pp. 201-205, Kluwer Academic Publishers, 1993.
- Bair W, Koch C, Newsome W and Britten K, Power spectrum analysis of MT neurons in the awake monkey. In: *Computation and Neural Systems* 92. Eeckman, F., ed., pp. 495-502, Kluwer Academic Publishers, 1993.
- Horiuchi T, Bishofberger B and Koch C, Building an analog VLSI saccadic eye movement system. In: *Advances in Neural Information Processing Systems* 6. Hanson, S.J. , Cowan, J. and Giles, L., pp. 582-589, Morgan Kaufmann, San Mateo, 1994.
- Bernander Ö, Douglas RJ and Koch C, Amplification and linearization of synaptic input to the apical dendrites of cortical pyramidal neurons. In: *Advances in Neural Information Processing Systems* 6. Hanson SJ, Cowan J and Giles L, pp. 519-526, Morgan Kaufmann, San Mateo, 1994.
- Stemmler M, Usher M, Koch C and Olami Z, Synchronization, oscillations and 1/f noise in networks of spiking neurons. In: *Advances in Neural Information Processing Systems* 6. Hanson SJ, Cowan J and Giles L, pp. 629-638, Morgan Kaufmann, San Mateo, 1994.
- Bair W, Koch C, Newsome W and Britten K, Relating temporal properties of spike trains from area MT neurons to the behavior of the monkey. In: *Temporal Coding in the Brain*. Buzsaki G, Llinas R, Singer W. Berthoz A, and Christen Y, eds., pp. 221-249, Springer Verlag, Heidelberg, 1994.
- Niebur E and Koch C, Models for the neurophysiological basis of attention based on the temporal structure of neural signals. In: *Oscillatory Event Related Brain Dynamics*. Elbert T, Lütkenhöner B and Pantev C, eds., pp. 295-309. Plenum Press: London, 1994.
- Stemmler M, Usher M and Koch C, Oscillatory field potentials in the presence of irregular single cell discharge patterns. In: *Computation and Neural Systems*. Bower J, ed., pp. 335-340. Kluwer: Norwell, MA, 1995.
- Bair W and Koch C, Precision and reliability of neocortical spike trains in the behaving monkey. In: *Computation and Neural Systems*. Bower, J., eds., pp. 53-58. Kluwer: Norwell, MA, 1995.
- Indiveri G, Kramer J and Koch C, Analog VLSI architecture for computing heading direction. In: *Proc Intelligent Vehicles '95*. pp. 24-29, IEEE Industrial Electronics Society, Detroit, Michigan, September 1995.
- Suarez H, Koch C and Douglas RJ, Direction selectivity in primary visual cortex using massive intracortical connections. In: *Advances in Neural Information Processing Systems* 7. Hanson SJ, Cowan J and Giles L, eds., pp. 3-10. Morgan Kaufmann, San Mateo, 1995.

- Kramer J, Sarpeshkar R and Koch C, An Analog VLSI Velocity Sensor. In: *Proc IEEE Int. Symp. Circuits and Systems (ISCAS 1995)*. pp. 413-416. Seattle, Washington, DC 1995.
- Indiveri G, Kramer J and Koch C, Analog VLSI architecture for computing heading direction. In: *Proc Intelligent Vehicles '95*. pp. 24-29, IEEE Industrial Electronics Society, Detroit, MI 1995.
- Horiuchi TK and Koch C, Analog VLSI Circuits for Visual Motion-Based Adaptation of Post-Saccadic Drift. In: *Proc 5th Intl. Conf. o Microelectronics for Neural Networks and Fuzzy Systems: MicroNeuro96*. pp. 60-66, 1996, Lausanne, Switzerland, IEEE Computer Society Press, Los Alamitos, CA 1996.
- Indiveri G, Kramer J and Koch C, System implementations of analog VLSI velocity sensors. In: *Proc 5th Intl. Conf. on Microelectronics for Neural Networks and Fuzzy Systems: MicroNeuro96*. pp. 60-66, Lausanne, Switzerland. IEEE Computer Society Press, 1996.
- Niebur E and Koch C, Control of Selective Visual Attention: Modeling the "Where" Pathway. In: *Advances in Neural Information Processing Systems 8*, Touretzky DS, Mozer MC and Hasselmo ME, eds., pp. 802-808. MIT Press: Cambridge, MA 1996.
- Indiveri G, Kramer J and Koch C, Parallel, analog VLSI architectures for computation of heading direction and time-to-contact. In: *Advances in Neural Information Processing Systems 8*. Touretzky, D. S., Mozer, M. C and Hasselmo, M. E., eds., pp. 720-726. MIT Press: Cambridge, MA 1996.
- Bair W, Koch C and Zohary E, Correlated neuronal response: time scales and mechanisms. In: *Advances in Neural Information Processing Systems 8*. Touretzky, D. S., Mozer, M. C and Hasselmo, M. E., eds., pp. 68-74. MIT Press: Cambridge, MA 1996.
- Kramer J, Sarpeshkar R and Koch C, Analog VLSI motion discontinuity detectors for image segmentation. In: *Proc IEEE Int. Symp. Circuits and Systems (ISCAS 1996)*. Atlanta, GA 1996.
- Horiuchi T, Morris T, Koch C and DeWeerth S, Analog VLSI circuits for attention-based, visual tracking. In: *Advances in Neural Information Processing Systems 9*. Mozer, M.C, Jordan, M.I. and Petsche, T. eds., pp. 706-712. MIT Press: Cambridge, MA 1997.
- Kruger W, Hasler P, Minch B and Koch C, An adaptive WTA using floating gate technology. In: *Advances in Neural Information Processing Systems 9*. Mozer, M.C, Jordan, M.I. and Petsche, T., eds., pp. 720-726. MIT Press: Cambridge, MA 1997.
- Gabbiani F, Metzner W, Wessel R and Koch C, Extraction of temporal features in the electrosensory system of weakly electric fish. In: *Advances in Neural*

Christof Koch

- Information Processing Systems 9*. Mozer, M.C, Jordan, M.I. and Petsche, T., eds., pp. 62-68. MIT Press: Cambridge, MA 1997.
- Higgins CM, and Koch C, Analog CMOS velocity sensors. In: *Solid State Sensor Arrays: Development and Applications*. SPIE 3019: 104-114, San Jose California, 1997.
- Deutschmann RA, Higgins CM and Koch C, Real-time analog VLSI sensors for 2-D direction of motion. In: *Artificial Neural Networks - ICANN '97*, Gerstner W, Germond A, Hasler M and Nicoud J-D, eds., pp. 1163-1168. Springer Verlag Berlin 1997.
- Harrison RR and Koch C, An Analog VLSI Implementation of the Fly Optomotor Control System. In: *AAAI 1998 Fall Symposium Series, Robots and Biology: Developing Connections*. pp. 11-27. Orlando, Florida, 1998.
- Deutschmann RA and Koch C, An analog VLSI velocity sensor using the gradient method. In: *Proc IEEE Int. Symp. Circuits and Systems (ISCAS 1998)*. Vol. 6, pp. 649-652, May 1998.
- Harrison RR and Koch C, An analog VLSI model of the fly elementary motion detector. In: *Advances in Neural Information Processing Systems 10*. Jordan, M.I., Kearns, M.J. and Solla, S.A. eds., pp. 880-886. MIT Press: Cambridge, MA 1998.
- Manwani A and Koch C, Synaptic transmission: An information-theoretic perspective. In: *Advances in Neural Information Processing Systems 10*. Jordan, M.I., Kearns, M.J. and Solla, S.A. eds., pp. 201-207. MIT Press: Cambridge, MA 1998.
- Itti L, Braun J, Lee K and Koch C, A model of early visual processing. In: *Advances in Neural Information Processing Systems 10*. Jordan, M.I., Kearns MJ and Solla SA, eds., pp. 201-207. MIT Press: Cambridge, MA 1998.
- Itti L, Braun J, Lee DK and Koch C, Attentional modulation of human pattern discrimination psychophysics reproduced by a quantitative model. In: *Advances in Neural Information Processing Systems 11*. Kearns, M.S., Solla, S.A. and Cohn, D.A., eds., pp. 789-795. MIT Press: Cambridge, MA, 1999.
- Higgins C and Koch C, An integrated vision sensor for the computation of optical flow singular points In: *Advances in Neural Information Processing Systems 11*. Kearns MS, Solla SA and Cohn DA, eds., pp. 699-705. MIT Press: Cambridge, MA, 1999.
- Stemmler M and Koch C, Information maximization in single neurons. In: *Advances in Neural Information Processing Systems 11*. Kearns, M.S., Solla, S.A. and Cohn, D.A., eds., pp. 160-166. MIT Press: Cambridge, MA, 1999.
- Manwani A and Koch C, Signal detection in noisy weakly-active dendrites. In: *Advances in Neural Information Processing Systems 11*. Kearns, M.S., Solla, S.A. and Cohn, D.A., eds., pp. 132-138. MIT Press: Cambridge, MA, 1999.

Christof Koch

- Pesavento A and Koch C, Feature Detection in Analog VLSI. In: *Proceedings of the 1999 33rd Annual Asilomar Conference on Signals, Systems, and Computers*. Pacific Grove, CA, 1999.
- Pesavento A and Koch C, A Wide Linear Range Four Quadrant Multiplier in Subthreshold CMOS. In: *Proceedings of the 1999 IEEE International Symposium on Circuits and Systems (ISCAS '99)*. Orlando FL, 2: 240-243, 1999.
- Pesavento A, Horiuchi T, Diorio C, and Koch C, Adaptation of Current Signals with Floating-Gate Circuits. In: *Proceedings of the 7th International Conference on Microelectronics for Neural, Fuzzy, and Bio-Inspired Systems (MicroNeuro99)*. Granada, Spain, pp. 128-134, 1999.
- Itti L and Koch C, A comparison of feature combination strategies for saliency-based visual attention systems. *Proc SPIE Human Vision and Electronic Imaging IV* Vol. **3644**, 1999.
- Itti L and Koch C, Target detection using saliency-based attention. In: *Search and Target Acquisition (RTO Meeting Proceedings 45, NATO)*. RTO-MP-45, March 2000.
- Billock JG, Psaltis D and Koch C, The match fit algorithm: A testbed for the computational motivation of attention. 2001 Intl. Conf. Comp. Science, San Francisco. In: *Lecture Notes in Computer Science*. **2074** II, Alexandrov, V., Dongarra, J., Juliano, B., Renner, R. and Tan, C.J., eds., pp. 208-216. Springer: New York, New York, 2001.
- Billock JG, Psaltis D, Gray N and Koch C, Learning with an Attention-based supervisor. *Fifth Intl. Conf. on Cognitive and Neural Systems*. Boston, MA, May 31-Jun 2, 2001.
- Zenger B and Koch C, Divisive and subtractive mask effects: Linking psychophysics and biophysics. In: *Advances in Neural Information Processing Systems 13*. Leen, T.W., Dietterich, T.G. and Tresp, V. eds., pp. 915-921. MIT Press: Cambridge, MA, 2001.
- Pesavento A and Koch C, Methods and Circuits for Focal-Plane Computation of Feature in CMOS Visual Sensors. In: *Advanced Research in VLSI: Proceedings of the 2001 Conference on Advanced Research in VLSI*. Brunvand, E. and Myers, C editors, pp238-248, IEEE Computer Society Press, 2001.
- Pesavento A and Koch C, A CMOS Imager with Focal-Plane Computation for Feature Detection. In: *Proceedings of the 2001 IEEE International Symposium on Circuits and System (ISCAS '01)*. Sydney, Australia, 2001.
- Edgington D, Walther D, Salamy KA, Risi R, Sherlock RE and Koch C, Automated Event Detection in Underwater Video. In: *MTS/IEEE Oceans*. San Diego, California, 2003.

Christof Koch

- Walther D, Edgington DR and Koch C, Detection and Tracking of Objects in Underwater Video. *IEEE International Conference on Computer Vision and Pattern Recognition*. I, 544-549, 2004.
- Rutishauser U, Walther D, Koch C and Perona P, Is attention useful for object recognition? *IEEE International Conference on Computer Vision and Pattern Recognition*. II, 37-44. 2004.
- Walther D, Rutishauser U, Koch C and Perona P, On the usefulness of attention for object recognition, *2nd Workshop on Attention and Performance in Computational Vision at the European Conference for Computer Vision*, 96-103, 2004.
- Koch C, What is consciousness. *Global Agenda Magazine*, Annual World Economic Forum 3: 210-212, 2005.
- Harel J, Koch C and Perona P, Graph-based visual saliency. *Neural Information Processing Systems*, in press.

Book Reviews and Commentaries:

- Koch C, Mathematical aspects of Hodgkin-Huxley neural theory: a review of Jane Cronin's book. *Trends in Neuroscience* 11: 284-285, 1988.
- Koch C, The computational options. A review of "Neural and Brain Modeling" by R. MacGregor. *Nature* 335: 213-214, 1988.
- Koch C, Sleeping and Dreaming. A review of "Brainstem Control of Wakefulness and Sleep" by M. Steriade and R. W. McCarley and "Thalamic Oscillations and Signaling" by M. Steriade, E. G. Jones and R. Llinas. *Science* 251: 326-327, 1991.
- Koch C, A heroic program. A review of "Neuronal Networks of the Hippocampus" by R. Traub and R. Miles. *Science* 255: 741-742, 1991.
- Koch C, Good vibes. *Proc Natl. Acad. Sci USA* 90: 1637-1638, 1993.
- Koch C, A neuronal correlate of consciousness? *Current Biology*. 6: 492, 1996.
- Koch C, Hard-headed dualism. A review of "The Conscious Mind: In Search of a Fundamental Theory" by D. Chalmers. *Nature* 381: 123-124, 1996.
- Koch C and Tootell RBH, Visual psychophysics: Stimulating brain but not mind. *Nature* 383: 301-303, 1996.
- Koch C and Poggio T, Predicting the visual world: Silence is golden. *Nature Neurosci.* 2: 7-8, 1999.
- Koch C, A lighthouse for neural modeling. A review of *Theoretical Neuroscience* by P. Dayan and L. Abbott. *Nature Neuroscience* 5: 195, 2002.
- Koch C, Introduction to Consciousness. In: *The Cognitive Neurosciences*, 3-nd edition, Gazzaniga, MS, editor. pp. 1107-1109. MIT Press, Cambridge, MA, 2004.

Christof Koch

- Koch C, Thinking about the conscious mind. A review of *Mind – A Brief Introduction* by J. Searle. *Science* **306**: 979-980, 2004.
- Koch C, The inchoate science of Consciousness. *The Scientist* **19**: 14-17, 2005.
- Koch C, The movie in your head. *Scientific American Mind*, in press.
- Koch C and Preuschoff K, Betting the house on consciousness. *Nature Neurosci.* **10**:140-1, 2007.

German Articles:

- Koch C, Der amerikanische Erfolg: Unterschiede in der Elitenbildung diesseits und jenseits des Atlantiks. *Frankfurter Allgemeine Zeitung*, 13. Juli, 1985.
- Koch C, Rechner lernen vom Gehirn. *Frankfurter Allgemeine Zeitung*, 25. Februar, 1987.
- Poggio T und Koch C, Wie Synapsen Bewegung verrechnen. *Spektrum der Wissenschaft*, pp. 78-84, Juli 1987.
- Koch C, Dem Bewußtsein auf der Spur. *Die Welt*. 22. November 1991.
- Koch C Konturen des Bewußtseins. *Frankfurter Allgemeine Zeitung*. 31. Dezember 1991.
- Crick FC und Koch C, Das Problem des Bewußtseins. *Spektrum der Wissenschaft*, pp. 144-152, November 1992.
- Koch C, Zu den neurobiologischen Grundlagen des Bewußtseins. In: *Sehnsucht: Über die Veränderung der visuellen Wahrnehmung*. Kunst- und Ausstellungshalle der Bundesrepublik Deutschland GmbH. pp. 182-193. Steidl Verlag, Göttingen, 1995.
- Koch C, Wir sind keine Zombies. *Frankfurter Allgemeine Zeitung*. 20. Februar, 2004.
- Koch C, Francis Crick – ein Leben für die Wissenschaft. *Neue Zürcher Zeitung*. 13. Oktober 2004.
- Monyer H, Rösler F, Roth G, Scheich H, Singer W, Elger CE, Friederici A, Koch C, Luhmann H, von der Malsburg C. and Menzel R, Das Manifest – Elf führende Neurowissenschaftler über Gegenwart und Zukunft der Hirnforschung. *Gehirn & Geist* **3**: 30-37, 2004.
- Koch C, Die Zukunft der Hirnforschung. Das Bewußtsein steht vor seiner Enthüllung. In: *Hirnforschung und Willensfreiheit*. Geyer C., Herausgeber, pp. 229-234. Edition Suhrkamp, 2004.
- Koch C, Kintopp der Sinne. *Gehirn & Geist* **4**: 41-46, 2005.
- Koch C, Kann der Mensch sich selbst erkennen? *Geo Wissen* **38**: 28-30, 2006.

Other Publications:

- Poggio T, Koch C and Torre V, Microelectronics in nerve cells: dendritic morphology and information processing. Artificial Intelligence Memo 650, MIT, Artificial Intelligence Laboratory, October, 1981.
- Poggio T and Koch C, Nonlinear interactions in a dendritic tree: localization, timing, and role in information processing. Artificial Intelligence Memo 657, MIT, Artificial Intelligence Laboratory, September, 1981.
- Koch C and Poggio T, Information processing in dendritic spines. Artificial Intelligence Memo 712, MIT, Artificial Intelligence Laboratory, March, 1983.
- Koch C and Poggio T, A theoretical analysis of electrical properties of spines. Artificial Intelligence Memo 713, MIT, Artificial Intelligence Laboratory, April, 1983.
- Koch C and Ullman S, Selecting one among the many: a simple network implementing shifts in selective visual attention. Artificial Intelligence Memo 770, MIT, Artificial Intelligence Laboratory, January, 1984.
- Koch C, A theoretical analysis of the electrical properties of an X-cell in the cat's LGN: does the spine-triad circuit subserve selective visual attention? Artificial Intelligence Memo 787, MIT, Artificial Intelligence Laboratory, February, 1984.
- Robinson HPC and Koch C, Calcium, spines and memory: a specific proposal. Artificial Intelligence Memo 779, MIT, Artificial Intelligence Laboratory, April, 1984.
- Poggio T and Koch C, An analog model of computation for the ill-posed problems of early vision. Artificial Intelligence Memo 783, MIT, Artificial Intelligence Laboratory, May, 1984.
- Sherman S M and Koch C, Anatomical and electrophysiological substrates of gating signal transmission in the lateral geniculate nucleus. Artificial Intelligence Memo 825, MIT, Artificial Intelligence Laboratory, June, 1985.
- Koch C, Marroquin J and Yuille A, Analog "neuronal" networks in early vision. Artificial Intelligence Memo 751, MIT, Artificial Intelligence Laboratory, June, 1985.
- Koch C, Poggio T and Torre V, Computations in the vertebrate retina: Gain enhancement, differentiation, and motion discrimination. Artificial Intelligence Memo 914, MIT, Artificial Intelligence Laboratory, September, 1986.
- Hildreth EC and Koch C, The analysis of visual motion: From computational theory to neuronal mechanisms. Artificial Intelligence Memo 919, MIT, Artificial Intelligence Laboratory, December, 1986.

Christof Koch

- Koch C, The origin of cortical orientation selectivity: A network model. Institute for Theoretical Physics Memo NSF-ITP-96-1491, UC Santa Barbara, October, 1986.
- Koch C, Modeling the electrical properties of single neurons. Short course syllabus of the Society for Neuroscience on "Computational Neuroscience," Los Angeles, 1987.
- Harris J, Koch C, Luo J and Wyatt J, Resistive fuses: analog hardware for detecting discontinuities in early vision. VLSI Memo No. 89-551, MIT, Cambridge, June, 1989.
- Koch C, When looking is not seeing: Towards a neurobiological view of awareness. *Engineering & Science* **56**: 2-13, 1993.
- Niebur E and Koch C, Modeling the "where" visual pathway. In: *Proc 2-nd Joint Symp. Neural Computation: Caltech-UCSD*, Institute for Neural Computation, UCSD, California, 1994.
- Kapre N, Walther D, Koch C and DeHon A, Saliency on a chip: A digital approach with a FPGA. *The Neuromorphic Engineer* **1(2)**: 10-11, 2004.
- Crick FC and Koch C, Comment les neurons fabriquent la conscience. *La Recherche* **390**: 48-53, 2005.

Abstracts are not listed.