

BIBLIOGRAPHY ON NEUROGEOMETRY

Projective Geometry, Projective Invariants, Recognition of Images and Vision

REFERENCES

- [SK] Semple and G. T. Kneebone, Algebraic Projective Geometry,
- [Hit] H.Hitchin, Lectures on Projective Geometry, Oxford, online.
- [CS] Corrochano, Sobczyk (ed) Geometric Algebra with Applications to Sciences and Engineering.
- [Fa] Oliver Faugeras, Three-dimensional computer vision. A Geometric viewpoint, 1993, 639p.,
- [FLP] Oliver Faugeras, Quang-Tuan Luong, Theo Papadopoulo, The Geometry of Multiple Images, Cambridge, 2001
- [CPW] Handbook of pattern recognition and computer vision /edited by C.H. Chen, L.F. Pau, P.S.P. Wang – 2nd ed. (R. Mohr, Chapter 2.4, Projective Geometry and Computer Vision)
- [PZ] Parrent P., Zucker S.W., Trace Inference, Curvature Consistency and Curve Detection, IEEE Trans. on Pattern Anal. and Machine Intell., vol.11,8, 823-839, 1989.
- [Sas] Sasaki, Projective Geometry and Linear Differential Equations,

Electromagnetic fields, Twistor Theory, Geometric Optics and Geometry of Lines

REFERENCES

- [KK] Klein M., Kay I.W., Electromagnetic theory and geometric optics, 1965.
- [WW] R.S.Ward, R. O. Wells Jr, Twistor Theory and Field Theory, Cambridge, 1990.
- [GB] A.Gerard, J.Burch, Introduction to matrix methods in optics,
- [BP] Binz, Pods, The Geometry of Heisenberg Group with Applications to Signal Theory, Optics, Quantum Theory and Field Quantization
- [GK] B. Guilfoyle and W. Klingenberg, *A Neutral Kähler structure on the space of oriented lines*, J. London Math. Soc. **72** (2005) 497–509.,
- [AGK] D.V.Alekseevsky, W.Klingenberg, B.Guilfoyle, *On the geometry of the space of oriented geodesics*, Ann. Glob. Anal. Geom., **vol.40**, no.4, 389-409, 2011,

1. TRANSFORMATION GROUPS IN NEUROSCIENCE

REFERENCES

- [H] WILLIAM C. HOFFMAN, The Lie Algebra of Visual Perception JOURNAL OF MATHEMATICAL PSYCHOLOGY: 3, 65-98 (1966)
- [H] D.Hestenes, Geometric algebra and spinors,
- [K] Kanisza Conformal group Dodwell P.C., 1983, Transformation group model for visual
- [Gre] Gregson R., Confusing rotation-like operations in space, mind and brain, British J. Math. and Stat. Psych., vol. 51(1), 136-162, 1998.
- [Nar] Narens L., Symmetry, direct measurement and Torgerson's conjecture, J. Math. Psych., vol. 50(3), 290-301. 2006.

- [Sch] Schonemann P., On possible psychophysical map: II. Projective transformations, Bull. Psychonomic Society, vol. 15(2), 65-68, 1980.
- [C-F] Chossat P., Faugeras O., Hyperbolic Planforms in Relation to Visual Edges and Texture Perception, Plo5 Computational Biology, v.5, 12, 1-16, 2009, (open access) (Invariance of perception w.r.t. transformations)

Luneburg-Blank Theory of Binocular Vision and Lobachevski Geometry

REFERENCES

- [L] Rudolf Karl Luneburg, Mathematical analysis of binocular vision
- [L] Rudolf Karl Luneburg, The metric of binocular visual space, J. Opt. Soc. America, 1950, 40, 627-642,
- [B] Blank A. A., Axiomatics of binocular vision, J. Opt. Soc. America, 1964, 54, 948-950,
- [B] Blank A. A., Analysis of experiments in binocular space perception, J. Opt. Soc. America, 1958, 48, 911-925,
- [B] Blank A. A., Curvature of binocular visual space, J. Opt. Soc. America, 1961, 51, 335-339,
- [Za] Zajaczkowska A., Experimental test of Luneburg's theory, J. Opt. Soc. America, 1956, 46, 514-527,
- [GH] Le Grand, H. Hardy, The geometry of binocular space perception,
- [Ind] Indow T., Hyperbolic representation of global structure of visual space, J. Math. Psychol., vol.41(1), 89-98, 1997.
- [C-F] Chossat P., Faugeras O., Hyperbolic Planforms in Relation to Visual Edges and Texture Perception, Plo5 Computational Biology, v.5, 12, 1-16, 2009, (open access)
- [F-C-F] Faye G., Chossat P., Faugeras O., Analysis of a hyperbolic geometric model for visual texture perception, J. Math. Neuroscience, 1-4, 2011, 1-43, open access,

Psychology of Recognition

REFERENCES

- [MP] Mathematical Psychology, Wikipedia,
- [LBG] Handbook in mathematical psychology, 1963, Luce, Bush, Galanter (ed.) Internet.
- [CS] Carlton, Shepard, Psychological simple motions as geodesic path, J. Math. Psych., 1990.
- [CKK] R.Cuijpers, A.Kappers, J. Koenderink, The metric on visual and haptic space based on parallel judgements, J. Math. Psych., vol.47(3), 278-2391, 2003.
- [D] D. Drosier, An n-dimensional Weber law and the corresponding Fechner law, J. Math. Psych., vol.44(20 , 330-335, 2000
- [E] Eates W., The Magic of Words Plus Numbers, PsycCRITIQUES, vol. 14(11), 1969.
- [Fal] Falmagne J.-C., Mathematical Psychology- A Perspective, J. Math. Psych., vol. 49(6), 436-439, 2005.
- [Fal] Falmagne J.-C., A set-theoretic outlook on the philosophy of Science, J. Math. Psych., vol. 51(1), 45-52, 2007.
- [Gar] Garson J., Is Logic of Core of Cognition?, PsycCRITIQUES, vol. 41(9), 1996.
- [Hof-Dod] Hoffman W.C., Dodwell P.C., Geometric psychology generates the visual Gestalt , Can.J. Psych., vol.39(4), 491-528, 1985.

- [Kar-Saf] Karni E., Safra Z., The hexagon condition and additive representation for two dimension. An algebraic approach, J. Math. Psych., vol.42(4),393-399, 1098.
- [Ki] Kiener S., On relationship between two types of effect caused by color adaptation, J. Math. Psych., vol.41(1), 107-121, 1997.
- [Kob] Koberning V., Cpmments on Edi Karni and Zvi Safra (1998), J. Math. Psych., vol.47(3),370, 2003.
- [Kon] Kondo K., RAAG memoirs of the unifying study of basic problems in engineering and physical sciences by means of geometry, Oxford, England.
- [Lef] Lefebre V.A.,Thbe fundamental structure of human reflexion, New York, 1990.
- [Lev] Levin D.N., A differential Geometric description of the relationship among perceptoions, J. Math. Psych., vol. 44(2), 2341-284, 2000.
- [Noe] , Norman M., Lectures on linear systems theory, J. Math. Psych., vol. 23(1), 1-89, 1981.
- [Tin] Tinken M., Review of Lewin's Topological and Vector Psychology, J. Educat. Psych., vol. 35(2), 125-126, 1944.
- [Wille] Wille U., The role of synthetic geometry in representational measurement theory, J. Math. Psych., vol.41(1), 71-78, 1997.

PSYCHOLOGY OF RECOGNITION

REFERENCES

- [F] Harry Foundalis, Fundamental Princiles of Recognition, www.foundalis.com,
- [BGG] Vicki Bruce, Patrick R. Green, Mark A. Georgeson, Visual perception: physiology, psychology, and ecology, 2003 (!!)
- [BF] BALES, J. F., AND FOLLANSBEE, G. L., The after-effect of the perception of curved lines, J. Exper. Psychol., 1935, 18, 499-503,
- [G] Gibson, J.J. (1982), Reasons for Realism: Selected essays of James J. Gibson, E. Reed and R. Jones (Eds.),
- [G1] J.J.Gibson, The Perception of the Visual World (1950) (!!)
- [G2] J.J.Gibson, ADAPTATION WITH NEGATIVE AFTER-EFFECT,1935, (!!)
- [GR] GIBSON, J. J., AND RADNER, M., Adaptation, after-effect, and contrast in the perception of tilted lines (). I. Quantitative studies (to be published in the J. Exper. Psychol.),
- [PMcC] Putts W., McCulloch W. S., How we persceive universals: the perception of auditory and visual forms, Bull. Math. Biophysics, 1947, 9, 127-147.
- [RS] F. S. ROBERTS and P. SUPPES SOME PROBLEMS IN THE GEOMETRY OF VISUAL PERCEPTION, Syntese 17, 1967, 173-201,
- [Pl] Platt J.R., How we see straight lines, Sci. America, 202, 1960, 121-129,
- [H1] William C. Hoffman, Pattern recognition by the method of isolines. A mathematical model for the visual integrative process. Boeing Sci. Research Lab. Math. Notes No. 351 1984, 27-28.
- [W] Wallach H., The perception of motion, Sci. America, 1959,201, 56-60,
- [Wi] , Wilson J.P., Perceptioanl anomalies associated with a singe contour, Nature, 1960, 1960, 187, 137,
- [Y] Steven Yantis (ed.) Visual perception: essential readings, 2001, 431p.,
- [NT] Noe, Alva Thompson, Evan (Eds) Vision and mind: Selected readings in the philosophy of perception, Cambridge, MA, US: MIT Press.
- [MRI] Magnetic Resonance Imaging

Physiology of Brain and Eye

REFERENCES

- [Hu] David Hubel's, Nobel Prise winner 1981, Eye, Brain and Vision (online)
- [R] The eye : the physiology of human perception / edited by Kara Rogers. 1st ed. p. cm. (The human body) In association with Britannica Educational Publishing, Rosen Educational Services, online,

Geometrical Models of Visual Cortex VI and Vision (following Petitot)

REFERENCES

- [H] Hoffmann W.C., Visual cortex 1989.
- [H1] William C. Hoffman, The Visual Cortex is a Contact Bundle, Applied Math. and Computation, vol.32, 137-169, 1989.
- [P] J. Petitot, The neurogeometry of pinwheels as a sub-Riemannian contact structure, J. Physiology, Paris, vol.97,(2-3), 265-309, 2003.
- [SCP] A. Sarti, G. Citti, J. Petitot, The symplectic structure of the primary visual cortex , Biol Cybern. (2008) 98:3348,
- [SCP1] A. Sarti, G. Citti, J. Petitot, Functional geometry of the horizontal connectivity in the primary visual cortex, J. Physiology, Paris, 103, 37-45, 2009.
- [M] Marr D. (1971) Simple memory: a theory for archicortex. Phil. Trans. Royal Soc. London, 262:23-81,
- [Z] Zeeman E.C., The topology of brain and visual perception, in M.K.Fort (Ed.) Topology of 3-manifolds, 1962.
- [GJ] Guatier, Jurdjevic, Hypo elliptic diffusion
- [G] J.P. Gauthier, Anthropomorphic image reconstruction via hypoelliptic diffusion, to appear in SIAM Journal on Control and Optimization.
- [BDGR] Ugo Boscain, Jean Duplaix, Jean-Paul Gauthier, Francesco Rossi, Anthropomorphic image reconstruction via hypoelliptic diffusion, math arXiv:1006.3735.

Gabor filters etc.

REFERENCES

- [??]

Dynamics of neuron filesds, Riemannian Geometry, Geodesics and Diffusion in Cortex

REFERENCES

- [LPPWDF] Emmanuel Prados, Christophe Lenglet, Jean-Philippe Pons, Nicolas Wotawa, Rachid Deriche, Olivier Faugeras, Stefano Soatto, Control Theory and fast marching techniques for brain connectivity mapping, ???
- [LPPDF] Christophe Lenglet, Emmanuel Prados, Jean-Philippe Pons, Olivier Faugeras, Rachid Deriche, Olivier Faugeras, Brain Connectivity Mapping using Riemannian Geometry, Control Theory and PDEs, SIIMS, 2008.
- [SCS] Sanguinetti, G., Citti, G., Sarti, A., Image Completion Using a Diffusion Driven Mean Curvature Flow in A Sub-Riemannian Space. In: VISAPP (2), pp. 4653 (2008).

- [G] Gauthier, The Intrinsic Hypoelliptic Laplacian and its Heat Kernel on Unimodular Lie Groups, *J. Funct. Anal.* 256 (2009), no. 8.
[K] . Kasue *Isr. J. Math.*, Kannai (Kanai)?

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