CONTENTS OF VOLUME I Circuit Theory S.T. Chui, J.J. Du, S.-T. Yau, "Resonances and circuit theory for the interaction of metallic disks and annuli with an electromagnetic field", Phys. Rev. E 90, 053202 (2014). **MRI Data Analysis** W. Yang, L.M. Lui, J.H. Gao, T.F. Chan, S-.T. Yau, R.A. Sperlinge, X. Huang, "Independent component analysis-based classification of Alzheimer's MRI data", J. Alzheimer's Disease Matrix Eigenvalues Ya Yan Lu, S.-T. Yau, "Eigenvalues of the Laplacian through boundary integral equations", S.-T. Yau, Ya-Yan Lu, "Reducing the symmetric matrix eigenvalue problem to matrix Scientific Computing M.-H. Yueh, W.-W. Lin, C.-T. Wu, S.-T. Yau, "An efficient energy minimization for conformal parameterizations", J. Sci. Computing 73 (2017), 203–227. M.-H. Yueh, W.-W. Lin, C.-T. Wu, S.-T. Yau, "A novel stretch energy minimization algorithm for equiareal parameterizations", J. Sci. Computing 78 (2019), no. 3,

MH. Yueh, T. Li, WW. Lin, ST. Yau, "A novel algorithm for volume-preserving parameterizations of 3-manifolds", <i>SIAM J. Imaging Sci.</i> 12 (2019), no. 2, 1071–1098. doi:10.1137/18M1201184
MH. Yueh, T. Li, WW. Lin, ST. Yau, "A new efficient algorithm for volume-preserving parameterizations of genus-one 3-manifolds", <i>SIAM J. Imaging Sci.</i> 13 (2020), no. 3, 1536–1564. doi:10.1137/19M1301096
WW. Lin, C. Juang, TM. Huang, T. Li, S. Wang, MH. Yueh, ST. Yau, "3D brain tumor segmentation using a two-stage optimal mass transport algorithm", <i>Sci. Rep.</i> 11, 14686 (2021). doi:10.1038/s41598-021-94071-1
YC. Kuo, WW. Lin, MH. Yueh, ST. Yau, "Convergent conformal energy minimization for the computation of disk parameterizations", <i>SIAM J. Imaging Sci.</i> 14 (2021), no. 4, 1790–1815. doi:10.1137/21M1415443
D. An, N. Lei, L. Cui, K. Su, X. Xu, F. Luo, X. Gu, ST. Yau, "A geometric variational framework for computing optimal transportation maps I", <i>Mathematics, Computation and Geometry of Data</i> (publication forthcoming, International Press)
Mathematical Biology: Evolutionary Dynamics
B. Allen, G. Lippner, YT. Chen, B. Fotouhi, N. Momeni, ST. Yau, M. A. Nowak, "Evolutionary dynamics on any population structure", <i>Nature</i> 544 (2017), 227–230. doi:10.1038/nature21723
Mathematical Physics: Quantum Information
Commentary by Gábor Lippner
M. Kempton, G. Lippner, ST. Yau, "Pretty good quantum state transfer in symmetric spin networks via magnetic field", <i>Quantum Inf. Process.</i> 16 (2017), no. 9, 210. doi:10.1007/s11128-017-1658-z
M. Kempton, G. Lippner, S-T Yau, "Perfect state transfer on graphs with a potential", Quantum Information & Computation 17 (2017) nos. 3–4, 303–327.
doi:10.26421/QIC17.3-4-7
Nonlinear Filtering
Commentary by Xiuqiong Chen
ST. Yau, Stephen ST. Yau, "Existence and decay estimates for time dependent parabolic equation with application to Duncan–Mortensen–Zakai equation", <i>Asian J. Math.</i> 2 (1998), no. 4, 1079–1150. doi:10.4310/AJM.1998.v2.n4.a17
ST. Yau, Stephen ST. Yau, "Finite dimensional filters with nonlinear drift XI: Explicit solution of the generalized Kolmogorov equation in the Brockett–Mitter program", <i>Adv. in Math.</i> 140 (1998), 156–189. doi:10.1006/aima.1998.1767

s1. Yau, Stephen S1. Yau, "Real time solution of nonlinear filtering problem without memory I", <i>Math. Res. Lett.</i> 7 (2000), no. 6, 671–693. doi:10.4310/MRL.2000.v7.n6.a2
ST. Yau, Stephen ST. Yau, "Solution of filtering problem with nonlinear observations", <i>SIAM J. Control & Optim.</i> 44 (2005), no. 3, 1019–1039. doi:10.1137/S0363012902411970
ST. Yau, Stephen ST. Yau, "Real time solution of the nonlinear filtering problem without memory II", SIAM J. Control & Optim. 47 (2008), no. 1, 163–195.
doi:10.1137/050648353
CONTENTS OF VOLUME II
Graph Theory
Commentary by Yong Lin
F.R.K. Chung, ST. Yau, Eigenvalue inequalities for graphs and convex subgraphs, <i>Commun. in Anal. & Geom.</i> 5 (1997), no. 4, 575–623. doi:10.4310/CAG.1997.v5.n4.a1
F. Chung, ST. Yau, "Coverings, heat kernels and spanning trees", <i>Electron. J. Combinatorics</i> 6 (1999), R12. doi:10.37236/1444
F. Chung, A. Grigor'yan, ST. Yau, "Higher eigenvalues and isoperimetric inequalities on Riemannian manifolds and graphs", <i>Commun. in Anal. & Geom.</i> 8 (2000), no. 5, 969–1026. doi:10.4310/CAG.2000.v8.n5.a2
Y. Lin, ST. Yau, "Ricci curvature and eigenvalue estimate on locally finite graphs", <i>Math. Res. Lett.</i> 17 (2010), no. 2, 343–356. doi:10.4310/MRL.2010.v17.n2.a13
Y. Lin, LY. Lu, ST. Yau, "Ricci curvature of graphs", <i>Tohoku Math. J.</i> 63 (2011), no. 4, 605–627. doi:10.2748/tmj/1325886283
Y. Lin, G. Lippner, ST. Yau, "Quantum tunneling on graphs", <i>Commun. in Math. & Phys.</i> 311 (2012), no. 1, 113–132. doi:10.1007/s00220-012-1453-8
F. Chung, Y. Lin, ST. Yau, "Harnack inequalities for graphs with non-negative Ricci curvature", <i>J. Math. Anal. & Appl.</i> 415 (2014), no. 1, 25–32. doi:10.1016/j.jmaa.2014.01.044.
A. Grigor'yan, Y. Lin, Y. Muranov, ST. Yau, "Homotopy Theory for Digraphs", <i>Pure & Appl. Math. Q.</i> 10 (2014), no. 4, 619–674. doi:10.4310/PAMQ.2014.v10.n4.a2
F. Bauer, P. Horn, Y. Lin, G. Lippner, D. Mangoubi, S-T Yau, "Li–Yau inequality on graphs", <i>J. Differ. Geom.</i> 99 (2015) no. 3, 359–405. doi:10.4310/jdg/1424880980
Paul Horn, Yong Lin, Shuang Liu, ST. Yau, "Volume doubling, Poincaré inequality and Gaussian heat kernel estimate for non-negatively curved graphs", <i>J. für die reine und ange-wandte Mathematik</i> 757 (2019), 89–130. doi:10.1515/crelle-2017-0038

A. Grigor'yan, Y. Lin, Yuri Muranov, ST. Yau, "Path complexes and their homologies", <i>J. Math. Sci.</i> 248 (2020), 564–599. doi:10.1007/s10958-020-04897-9
A. Huang, Y. Lin, ST. Yau, "Existence of solutions to mean field equations on graphs", Commun. in Math. & Phys. 377 (2020), 613–621. doi:10.1007/s00220-020-03708-1885
Medical Imaging
X. Gu, Y. Wang, T. F. Chan, P. M. Thompson, ST. Yau, "Genus zero surface conformal mapping and its application to brain surface mapping", <i>IEEE Trans. on Medical Imaging</i> 23 (2004), no. 8, 949–958. doi:10.1109/TMI.2004.831226
L.M. Lui, T.W. Wong, P.M. Thompson, T.F. Chan, X.F. Gu, S.T. Yau, "Shape-based diffeomorphic registration on hippocampal surfaces using Beltrami holomorphic flow", <i>Lect. Notes in Computer Sci.</i> 6362 (2010), 323–330. doi:10.1007/978-3-642-15745-5_40 907
Y. Wang, . Shi, X. Yin, Xianfeng Gu, T. F. Chan, ST. Yau, A. W. Toga, P. M. Thompson, "Brain surface conformal parameterization with the Ricci flow", <i>IEEE Trans. on Medical Imaging</i> 31 (2012), no. 2, 251–264. doi:10.1109/TMI.2011.2168233
Computer Vision
L.M. Lui, T.W. Wong, W. Zeng, X.F. Gu, P.M. Thompson, T.F. Chan, S.T. Yau, "Optimization of surface registrations using Beltrami holomorphic flow", <i>J. Sci. Computing</i> 50 (2012), no. 3, 557–585. doi:10.1007/s10915-011-9506-2
L.M. Lui, X.F. Gu, W. Zeng, S.T. Yau, "Beltrami representation for diffeomorphisms and its applications", in <i>Proc. of the Sixth Intl. Conf. of Chinese Mathematicians</i> . Vol. 37 of Adv. Lect. in Math. Intl. Press, Somerville, Mass. & Higher Ed. Press, Beijing, 2017, 523–552. ISBN 1-978-57146-3494
L.M. Lui, K.C. Lam, S.T. Yau, X.F. Gu, "Teichmüller mapping (T-Map) and its applications to landmark matching registrations", <i>SIAM J. on Imaging Sci.</i> 7 (2014) no. 1, 391–426. doi:10.1137/120900186
L.M. Lui, W. Zeng, S.T. Yau, X.F. Gu, "Shape analysis of planar multiply-connected objects using conformal welding", <i>IEEE Trans. on Pattern Anal. & Machine Intell.</i> 36 (2013), no. 7, 1384–1401
R. Shi, W. Zeng, Z. Su, J. Jiang, H. Damasio, Z. Lu, Y. Wang, ST. Yau, X. Gu, "Hyperbolic harmonic mapping for surface registration", <i>IEEE Trans. on Pattern Anal. & Machine Intell.</i> 39 (2017), no. 5, 965–980. doi:10.1109/TPAMI.2016.2567398
Computer Graphics and Geometric Modeling
Commentary by Xianfeng David Gu
X. Gu, M. Jin, Y. Wang, ST. Yau, "Optimal global conformal surface parameterization for visualization", <i>Comm. Inf. Syst.</i> 4 (2004), no. 2, 117–134. doi:10.4310/CIS.2004.v4.n2.a1 1087
M. Zhang, R. Guo, W. Zeng, F. Luo, ST. Yau, X. Gu, "The unified discrete surface Ricci flow", <i>Graphical Models</i> 76 (2014), no. 5, 321–339. doi:10.1016/j.gmod.2014.04.008 1105

Z. Su, J. Sun, X. Gu, F. Luo, ST. Yau, "Optimal mass transport for geometric modeling based on variational principles in convex geometry", <i>Eng. with Computers</i> 30 (2014), 475–486. doi:10.1007/s00366-014-0354-1
Artificial Intelligence
N. Lei, K. Su, L. Cui, ST. Yau, X.F. Gu, "A geometric view of optimal transportation and generative model", <i>Computer Aided Geom. Design</i> 68 (2019), 1–21. doi:10.1016/j.cagd.2018.10.005
Computational Geometry and Numerical Analysis
X. Gu, W. Zeng, F. Luo, ST. Yau, "Numerical computation of surface conformal mappings", Computational Methods & Function Theory 11 (2012), no. 2, 747–787. doi:10.1007/BF03321885
 W. Zeng, L.M. Lui, F. Luo, T.F. Chan, ST. Yau, X.F. Gu, "Computing quasiconformal maps using an auxiliary metric and discrete curvature flow", <i>Numerische Mathematik</i> 121 (2012), no. 4, 671–703. doi:10.1007/s00211-012-0446-z. 1205
L.M. Lui, X.F. Gu, S.T. Yau, Convergence of an iterative algorithm for Teichmüller maps via harmonic energy optimization, <i>Math. Computation</i> 84 (2015) no. 296, 2823–2842. doi:10.1090/S0025-5718-2015-02962-7
X. Gu, F. Luo, J. Sun, ST. Yau, Variational principles for Minkowski type problems, discrete optimal transport, and discrete Monge–Ampère equations, <i>Asian J. Math.</i> 20 (2016), no. 2, 383–398. doi:10.4310/AJM.2016.v20.n2.a7
Xianfeng Gu, Feng Luo and ST. Yau, "Computational conformal geometry behind modern technologies", <i>Notices of the American Mathematical Society</i> 67 :10 (Nov. 2020), 1509–1525. doi:10.1090/noti2164
Appendix
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