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References

- [1] The fundamental theorem of asset pricing for unbounded stochastic processes (1998). In *Springer Finance*, pages 279–317. Springer-Verlag.
- [2] Natural gradient works efficiently in learning. In *Unsupervised Learning*. The MIT Press, 1999.
- [3] Steady-state navier–stokes equations. In *Navier–Stokes Equations*, pages 105–165. American Mathematical Society, apr 2001.
- [4] Samson Abramsky and Bob Coecke. Categorical quantum mechanics. In *Handbook of Quantum Logic and Quantum Structures*, pages 261–323. Elsevier, 2009.
- [5] Erik M. Alfsen and Frederic W. Shultz. *Geometry of State Spaces of Operator Algebras*. Birkhäuser Boston, 2003.
- [6] R. Alicki and M. Fannes. Quantum dynamics, measurement and entropy. *Reports on Mathematical Physics*, 55(1):47–59, feb 2005.
- [7] Robert Alicki and Ronnie Kosloff. Introduction to quantum thermodynamics: History and prospects. In *Fundamental Theories of Physics*, pages 1–33. Springer International Publishing, 2018.
- [8] Douglas Allaire and Karen Willcox. A MATHEMATICAL AND COMPUTATIONAL FRAMEWORK FOR MULTI-FIDELITY DESIGN AND ANALYSIS WITH COMPUTER MODELS. *International Journal for Uncertainty Quantification*, 4(1):1–20, 2014.
- [9] Sergio Amaral, Douglas L. Allaire, Elena De La Rosa Blanco, and Karen Willcox. A decomposition-based uncertainty quantification approach for environmental impacts of aviation technology and operation. *AI EDAM*, 31(3):251–264, 2017.
- [10] Shun-ichi Amari. Information geometry of positive measures and positive-definite matrices: Decomposable dually flat structure. *Entropy*, 16(4):2131–2145, 2014.
- [11] Laurent Amour, Lisette Jager, and Jean Nourrigat. The weyl symbol of schrödinger semigroups. *Annales Henri Poincaré*, 16(6):1479–1488, aug 2014.
- [12] Neculai Andrei. New hybrid conjugate gradient algorithms for unconstrained optimization. In *Encyclopedia of Optimization*, pages 2560–2571. Springer US.
- [13] Angelos Angelidakis and Georgios Chalkiadakis. Factored mdps for optimal prosumer decision-making in continuous state spaces. In *EUMAS/AT*, volume 9571 of *Lecture Notes in Computer Science*, pages 91–107. Springer, 2015.
- [14] Paolo Antonelli and Pierangelo Marcati. On the finite energy weak solutions to a system in quantum fluid dynamics. *Communications in Mathematical Physics*, 287(2):657–686, sep 2008.
- [15] Sa"id Aoues, Damien Eberard, and Wilfrid Marquis-Favre. Canonical interconnection of discrete linear port-hamiltonian systems. In *CDC*, pages 3166–3171. IEEE, 2013.
- [16] M. Á. García Ariza. Degenerate hessian structures on radiant manifolds. *International Journal of Geometric Methods in Modern Physics*, 15(06):1850087, jun 2018.
- [17] Mauro Artigiani. Oseledets ’ multiplicative ergodic theorem and lyapunov exponents. 2013.
- [18] Patricia Astrid, Siep Weiland, Karen Willcox, and Ton Backx. Missing point estimation in models described by proper orthogonal decomposition. *IEEE Trans. Automat. Contr.*, 53(10):2237–2251, 2008.
- [19] Peter Auer, Harald Burgsteiner, and Wolfgang Maass. A learning rule for very simple universal approximators consisting of a single layer of perceptrons. *Neural Networks*, 21(5):786–795, jun 2008.
- [20] John C. Baez and Blake S. Pollard. A compositional framework for reaction networks. *Reviews in Mathematical Physics*, 29(09):1750028, oct 2017.
- [21] Radhakisan Baheti and Helen Gill. Cyber-physical systems. *The impact of control technology*, 12(1):161–166, 2011.
- [22] Ioannis Bakas. Renormalization group equations and geometric flows. *arXiv preprint hep-th/0702034*, 2007.
- [23] R. Balian and P. Valentin. Hamiltonian structure of thermodynamics with gauge. *The European Physical Journal B*, 21(2):269–282, may 2001.

- [24] Roger Balian. The entropy-based quantum metric. *Entropy*, 16(7):3878–3888, 2014.
- [25] Frédéric Barbaresco. Geometric theory of heat from Souriau Lie groups thermodynamics and Koszul Hessian geometry: Applications in information geometry for exponential families. *Entropy*, 18(11):386, 2016.
- [26] Frédéric Barbaresco. Higher order geometric theory of information and heat based on poly-symplectic geometry of Souriau Lie groups thermodynamics and their contextures: The bedrock for Lie group machine learning. *Entropy*, 20(11):840, 2018.
- [27] Frédéric Barbaresco. Koszul information geometry and Souriau Lie group thermodynamics. AIP Publishing LLC, 2015.
- [28] M Barbero-Liñán, H Cendra, E García-Toraño Andrés, and D Martín de Diego. New insights in the geometry and interconnection of port-hamiltonian systems. *Journal of Physics A: Mathematical and Theoretical*, 51(37):375201, aug 2018.
- [29] Howard Barnum, Jonathan Barrett, Marius Krumm, and Markus P. Müller. Entropy, majorization and thermodynamics in general probabilistic theories. *Electronic Proceedings in Theoretical Computer Science*, 195:43–58, nov 2015.
- [30] Dror Baron, Shriram Sarvotham, and Richard G. Baraniuk. Bayesian compressive sensing via belief propagation. *IEEE Trans. Signal Processing*, 58(1):269–280, 2010.
- [31] Luis Barreira, Yakov Pesin, and Jorg Schmeling. Dimension and product structure of hyperbolic measures. *The Annals of Mathematics*, 149(3):755, may 1999.
- [32] O. Bashir, K. Willcox, O. Ghattas, B. van Bloemen Waanders, and J. Hill. Hessian-based model reduction for large-scale systems with initial-condition inputs. *International Journal for Numerical Methods in Engineering*, 73(6):844–868, feb 2008.
- [33] Luca Bassi, Alessandro Macchelli, and Claudio Melchiorri. An algorithm to discretize one-dimensional distributed port hamiltonian systems. In *Lagrangian and Hamiltonian Methods for Nonlinear Control 2006*, pages 61–73. Springer Berlin Heidelberg.
- [34] Andreas Bastian. Identifying fuzzy models utilizing genetic programming. *Fuzzy Sets and Systems*, 113(3):333–350, 2000.
- [35] Andreas BASTIAN and Isao HAYASHI. An anticipating hybrid genetic algorithm for fuzzy modeling. *Journal of Japan Society for Fuzzy Theory and Systems*, 7(5):997–1006, 1995.
- [36] Martin Bauer, Sarang Joshi, and Klas Modin. Diffeomorphic density matching by optimal information transport. *SIAM J. Imaging Sciences*, 8(3):1718–1751, 2015.
- [37] Martin Bauer, Sarang Joshi, and Klas Modin. Diffeomorphic random sampling using optimal information transport. In *GSI*, volume 10589 of *Lecture Notes in Computer Science*, pages 135–142. Springer, 2017.
- [38] Martin Bauer, Sarang Joshi, and Klas Modin. On geodesic completeness for riemannian metrics on smooth probability densities. *Calculus of Variations and Partial Differential Equations*, 56(4), jul 2017.
- [39] Martin Bauer and Klas Modin. Semi-invariant riemannian metrics in hydrodynamics. *arXiv preprint arXiv:1810.03424*, 2018.
- [40] Ulrike Baur, Christopher A. Beattie, Peter Benner, and Serkan Gugercin. Interpolatory projection methods for parameterized model reduction. *SIAM J. Scientific Computing*, 33(5):2489–2518, 2011.
- [41] Christopher Beattie and Serkan Gugercin. Structure-preserving model reduction for nonlinear port-hamiltonian systems. In *IEEE Conference on Decision and Control and European Control Conference*. IEEE, dec 2011.
- [42] Christopher Beattie, Volker Mehrmann, Hongguo Xu, and Hans Zwart. Linear port-hamiltonian descriptor systems. *MCSS*, 30(4):17:1–17:27, 2018.
- [43] Christopher A. Beattie, Volker Mehrmann, Hongguo Xu, and Hans Zwart. Port-hamiltonian descriptor systems. 2017.
- [44] Peter Benner, Serkan Gugercin, and Karen Willcox. A survey of projection-based model reduction methods for parametric dynamical systems. *SIAM Review*, 57(4):483–531, 2015.
- [45] Peter Benner and Steffen Werner. Hankel-norm approximation of large-scale descriptor systems. 2018.
- [46] Petter Andreas Bergh and Steffen Oppermann. Cohomology of twisted tensor products. *Journal of Algebra*, 320(8):3327–3338, oct 2008.

- [47] Bart Besselink, Henrik Sandberg, and Karl Henrik Johansson. Clustering-based model reduction of networked passive systems. *IEEE Trans. Automat. Contr.*, 61(10):2958–2973, 2016.
- [48] Indranil Biswas, John Loftin, and Matthias Stemmler. Flat bundles on affine manifolds. *Arabian Journal of Mathematics*, 2(2):159–175, jan 2013.
- [49] Matthias Blau, Kumar Shiv Narain, and George S Thompson. Instantons, the information metric, and the ads/cft correspondence. 2001.
- [50] Reinhard Blutner. Questions and answers in an orthoalgebraic approach. *Journal of Logic, Language and Information*, 21(3):237–277, 2012.
- [51] Arthur Bousquet, Martine Marion, and Roger Temam. Finite volume multilevel approximation of the shallow water equations. In *Partial Differential Equations: Theory, Control and Approximation*, pages 67–98. Springer Berlin Heidelberg, 2014.
- [52] Philippe Brax. Lectures on screened modified gravity. 2012.
- [53] Corentin Briat and Mustafa Khammash. Ergodicity analysis and antithetic integral control of a class of stochastic reaction networks with delays. *CoRR*, abs/1811.09188, 2018.
- [54] Dorje C Brody. Geometry of the complex extension of wigner’s theorem. *Journal of Physics A: Mathematical and Theoretical*, 46(39):395301, 2013.
- [55] Dorje C. Brody and Adam Ritz. On the symmetry of real-space renormalisation. *Nuclear Physics B*, 522(3):588–604, jul 1998.
- [56] James K Brooks. On a theorem of dieudonné. *Advances in Mathematics*, 36(2):165–168, may 1980.
- [57] K S Brown, C C Hill, G A Calero, C R Myers, K H Lee, J P Sethna, and R A Cerione. The statistical mechanics of complex signaling networks: nerve growth factor signaling. *Physical Biology*, 1(3):184–195, oct 2004.
- [58] Tan Bui-Thanh, Karen Willcox, and Omar Ghattas. Model reduction for large-scale systems with high-dimensional parametric input space. *SIAM J. Scientific Computing*, 30(6):3270–3288, 2008.
- [59] Florentina Bunea, Peter Hoff, Chris Holmes, Peter Kim, Vladimir Koltchinskii, John Lafferty, Gilad Lerman, Sara van de Geer, Marten Wegkamp, Bin Yu, et al. Low-dimensional structure in high-dimensional systems 2013–2014 samsi program report, december 2014.
- [60] L. T. Butler and B. Levit. A bayesian approach to the estimation of maps between riemannian manifolds. *Mathematical Methods of Statistics*, 16(4):281–297, dec 2007.
- [61] Yufei Cai, Paolo G. Giarrusso, Tillmann Rendel, and Klaus Ostermann. A theory of changes for higher-order languages: incrementalizing λ -calculi by static differentiation. In *PLDI*, pages 145–155. ACM, 2014.
- [62] Kevin Carlberg, Charbel Farhat, Julien Cortial, and David Amsallem. The GNAT method for nonlinear model reduction: Effective implementation and application to computational fluid dynamics and turbulent flows. *J. Comput. Physics*, 242:623–647, 2013.
- [63] Alexandra Carpentier and Rami Munos. Toward optimal stratification for stratified monte-carlo integration. In *ICML (2)*, volume 28 of *JMLR Workshop and Conference Proceedings*, pages 28–36. JMLR.org, 2013.
- [64] Sebastian Casalaina-Martin and Jonathan Wise. An introduction to moduli stacks, with a view towards higgs bundles on algebraic curves. In *The Geometry, Topology and Physics of Moduli Spaces of Higgs Bundles*, pages 199–399. WORLD SCIENTIFIC, jun 2018.
- [65] Fergal P. Casey, Joshua J. Waterfall, Ryan N. Gutenkunst, Christopher R. Myers, and James P Sethna. Variational method for estimating the rate of convergence of markov-chain monte carlo algorithms. *Physical review. E, Statistical, nonlinear, and soft matter physics*, 78 4 Pt 2:046704, 2008.
- [66] Fernando Castaños, Romeo Ortega, Arjan van der Schaft, and Alessandro Astolfi. Asymptotic stabilization via control by interconnection of port-hamiltonian systems. *Automatica*, 45(7):1611–1618, jul 2009.
- [67] Doran Chakraborty and Peter Stone. Structure learning in ergodic factored mdps without knowledge of the transition function’s in-degree. In *Proceedings of the 28th International Conference on Machine Learning (ICML-11)*, pages 737–744. Citeseer, 2011.

- [68] Patrick Charbonneau, Yi Hu, Archishman Raju, James P. Sethna, and Sho Yaida. Morphology of renormalization-group flow for the de almeida–thouless–gardner universality class. *Physical Review E*, 99(2), feb 2019.
- [69] Saifon Chaturantabut and Danny C. Sorensen. Discrete empirical interpolation for nonlinear model reduction. In *Proceedings of the 48th IEEE Conference on Decision and Control (CDC) held jointly with 2009 28th Chinese Control Conference*. IEEE, dec 2009.
- [70] Saifon Chaturantabut and Danny C. Sorensen. Nonlinear model reduction via discrete empirical interpolation. *SIAM Journal on Scientific Computing*, 32(5):2737–2764, jan 2010.
- [71] Lingen Chen, Chih Wu, and Fengrui Sun. Finite time thermodynamic optimization or entropy generation minimization of energy systems. *Journal of Non-Equilibrium Thermodynamics*, 24(4), jan 1999.
- [72] Xiaodong Cheng, Yu Kawano, and Jacqueliën M. A. Scherpen. Graph structure-preserving model reduction of linear network systems. In *ECC*, pages 1970–1975. IEEE, 2016.
- [73] Xiaodong Cheng, Jacqueliën M.A. Scherpen, and Bart Besselink. Balanced truncation of networked linear passive systems. *Automatica*, 104:17–25, jun 2019.
- [74] Giulio Chiribella. Dilation of states and processes in operational-probabilistic theories. In *QPL*, volume 172 of *EPTCS*, pages 1–14, 2014.
- [75] Erhan Çinlar, Jean Jacod, Philip Protter, and MJ Sharpe. Semimartingales and markov processes. *Probability Theory and Related Fields*, 54(2):161–219, 1980.
- [76] James Clift and Daniel Mufet. Derivatives of turing machines in linear logic. 2018.
- [77] Bob Coecke, Ross Duncan, Aleks Kissinger, and Quanlong Wang. Strong complementarity and non-locality in categorical quantum mechanics. In *LICS*, pages 245–254. IEEE Computer Society, 2012.
- [78] Tiangang Cui, Youssef M. Marzouk, and Karen Willcox. Scalable posterior approximations for large-scale bayesian inverse problems via likelihood-informed parameter and state reduction. *J. Comput. Physics*, 315:363–387, 2016.
- [79] Thomas Lynn Curtright, David B. Fairlie, and Cosmas K. Zachos. A concise treatise on quantum mechanics in phase space. 2014.
- [80] Bryan C Daniels, Yan-Jiun Chen, James P Sethna, Ryan N Gutenkunst, and Christopher R Myers. Sloppiness, robustness, and evolvability in systems biology. *Current Opinion in Biotechnology*, 19(4):389–395, aug 2008.
- [81] Philippe de Forcrand and Oliver Jahn. Comparison of $SO(3)$ and $SU(2)$ lattice gauge theory. *Nuclear Physics B*, 651(1-2):125–142, feb 2003.
- [82] G'ery de Saxc'e. Link between lie group statistical mechanics and thermodynamics of continua. *Entropy*, 18(7):254, 2016.
- [83] Eric de Sturler, Serkan Gugercin, Misha Kilmer, Chris Beattie, Saifon Chaturantabut, and Meghan OConnell. Model reduction techniques for fast nonlinear inversion. In *Householder Symposium XIX June 8-13, Spa Belgium*, page 53. Citeseer.
- [84] Thomas Degris, Olivier Sigaud, and Pierre-Henri Wuillemin. Learning the structure of factored markov decision processes in reinforcement learning problems. In *ICML*, volume 148 of *ACM International Conference Proceeding Series*, pages 257–264. ACM, 2006.
- [85] Qi Deng, Yi Cheng, and Guanghai Lan. Optimal adaptive and accelerated stochastic gradient descent. *CoRR*, abs/1810.00553, 2018.
- [86] Alexandre Deur, Stanley J Brodsky, and Guy F de Téramond. The qcd running coupling. *Progress in Particle and Nuclear Physics*, 90:1–74, 2016.
- [87] Eric D’Hoker and D. H. Phong. Lectures on supersymmetric yang-mills theory and integrable systems. In *Theoretical Physics at the End of the Twentieth Century*, pages 1–125. Springer New York, 2002.
- [88] Nuno Costa Dias and João Nuno Prata. Bohmian trajectories and quantum phase space distributions. *Physics Letters A*, 302(5-6):261–272, sep 2002.
- [89] B P Dolan, D A Johnston, and R Kenna. The information geometry of the one-dimensional potts model. *Journal of Physics A: Mathematical and General*, 35(43):9025–9035, oct 2002.

- [90] Ron Donagi. Spectral covers. *Current Topics in Complex Algebraic Geometry (Berkeley, CA 1992/93)*, *Math. Sci. Res. Inst. Publ.*, 28:65–86, 1995.
- [91] Ron Donagi and Edward Witten. Supersymmetric yang-mills theory and integrable systems. *Nuclear Physics B*, 460(2):299–334, feb 1996.
- [92] Ron Y Donagi. Seiberg-witten integrable systems. *arXiv preprint alg-geom/9705010*, 1997.
- [93] Aleksandar Donev and Eric Vanden-Eijnden. Dynamic density functional theory with hydrodynamic interactions and fluctuations. *The Journal of Chemical Physics*, 140(23):234115, jun 2014.
- [94] Petros Drineas, Eleni Drinea, and Patrick S. Huggins. An experimental evaluation of a monte-carlo algorithm for singular value decomposition. In *Panhellenic Conference on Informatics*, volume 2563 of *Lecture Notes in Computer Science*, pages 279–296. Springer, 2001.
- [95] Petros Drineas, Ravi Kannan, and Michael W. Mahoney. Fast monte carlo algorithms for matrices II: computing a low-rank approximation to a matrix. *SIAM J. Comput.*, 36(1):158–183, 2006.
- [96] Martin Drohmann, Bernard Haasdonk, and Mario Ohlberger. Reduced basis approximation for nonlinear parametrized evolution equations based on empirical operator interpolation. *SIAM J. Scientific Computing*, 34(2), 2012.
- [97] Detlef Dürr, Sheldon Goldstein, and Nino Zanghì. Quantum equilibrium and the role of operators as observables in quantum theory. In *Quantum Physics Without Quantum Philosophy*, pages 79–161. Springer Berlin Heidelberg, nov 2012.
- [98] Miguel A Durán-Olivencia, Peter Yatsyshin, Benjamin D Goddard, and Serafim Kalliadasis. General framework for fluctuating dynamic density functional theory. *New Journal of Physics*, 19(12):123022, dec 2017.
- [99] D. Eberard, B. Maschke, and A.J. van der Schaft. CONSERVATIVE SYSTEMS WITH PORTS ON CONTACT MANIFOLDS. *IFAC Proceedings Volumes*, 38(1):342–347, 2005.
- [100] D. Eberard, B.M. Maschke, and A.J. van der Schaft. An extension of hamiltonian systems to the thermodynamic phase space: Towards a geometry of nonreversible processes. *Reports on Mathematical Physics*, 60(2):175–198, oct 2007.
- [101] Yalchin Efendiev, Juan Galvis, and Thomas Y. Hou. Generalized multiscale finite element methods (gmsfem). *J. Comput. Physics*, 251:116–135, 2013.
- [102] Malcolm Egan, Trang C. Mai, Trung Quang Duong, and Marco Di Renzo. Coordination via advection dynamics in nanonetworks with molecular communication. In *ICC*, pages 1–6. IEEE, 2018.
- [103] Susanne Ehret, Francesco Capponi, Luigi Del Debbio, Roberto Pellegrini, Antonin Portelli, and Antonio Rago. Renormalisation of the scalar energy-momentum tensor with the wilson flow. In *Proceedings of 34th annual International Symposium on Lattice Field Theory — PoS(LATTICE2016)*. Sissa Medialab, feb 2017.
- [104] Ahmad Hosny Eid. Introducing geometric algebra to geometric computing software developers: A computational thinking approach. *CoRR*, abs/1705.06668, 2017.
- [105] David Ellerman. Introduction to quantum logical information theory. *SSRN Electronic Journal*, 2017.
- [106] Conal Elliott. The simple essence of automatic differentiation. *PACMPL*, 2(ICFP):70:1–70:29, 2018.
- [107] Ulrich Ellwanger. Confinement, monopoles and wilsonian effective action. *Nuclear Physics B*, 531(1-3):593–612, oct 1998.
- [108] H. Ennsbrunner and K. Schlacher. On the geometrical representation and interconnection of infinite dimensional port controlled hamiltonian systems. In *Proceedings of the 44th IEEE Conference on Decision and Control*. IEEE.
- [109] Hector Ramirez Estay, Bernhard Maschke, and Daniel Sbarbaro. Modelling and control of multi-energy systems: An irreversible port-hamiltonian approach. *Eur. J. Control*, 19(6):513–520, 2013.
- [110] Hector Ramirez Estay, Hans Zwart, and Yann Le Gorrec. Stabilization of infinite dimensional port-hamiltonian systems by nonlinear dynamic boundary control. *Automatica*, 85:61–69, 2017.
- [111] Zhou Fang and Chuanhou Gao. Lyapunov function partial differential equations for chemical reaction networks. *arXiv preprint arXiv:1510.04044*, 2015.
- [112] Colleen M Farrelly. Topology and geometry in machine learning for logistic regression, Oct 2017.

- [113] Domenico Felice, Carlo Cafaro, and Stefano Mancini. Information geometric complexity of a trivariate gaussian statistical model. *Entropy*, 16(6):2944–2958, 2014.
- [114] Pablo Fernández, Ngoc-Cuong Nguyen, and Jaime Peraire. Entropy-stable hybridized discontinuous galerkin methods for the compressible euler and navier-stokes equations. 2018.
- [115] Massimo Ferri. Why topology for machine learning and knowledge extraction? *Machine Learning and Knowledge Extraction*, 1(1):115–120, 2018.
- [116] José Luis Figueroa and Juan E. Cousseau. Dynamical functional artificial neural network: use of efficient piecewise linear functions. 2008.
- [117] Alexander L. Fradkov. Horizons of cybernetical physics. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 375(2088):20160223, jan 2017.
- [118] J. K. Freericks, V. M. Turkowski, and V. Zlatić. Nonequilibrium dynamical mean-field theory. *Physical Review Letters*, 97(26), dec 2006.
- [119] Alan M. Frieze, Ravi Kannan, and Santosh Vempala. Fast monte-carlo algorithms for finding low-rank approximations. *J. ACM*, 51(6):1025–1041, 2004.
- [120] Masatoshi Funabashi. Network decomposition and complexity measures: An information geometrical approach. *Entropy*, 16(7):4132–4167, 2014.
- [121] David Galbally, Krzysztof J. Fidkowski, Karen Willcox, and Omar Ghattas. Nonlinear model reduction for uncertainty quantification in large-scale inverse problems. 2008.
- [122] Peter Gawthrop and Edmund J. Crampin. Bond graph representation of chemical reaction networks. *IEEE Transactions on NanoBioscience*, 17(4):449–455, oct 2018.
- [123] Paolo Gibilisco and Tommaso Isola. On the monotonicity of scalar curvature in classical and quantum information geometry. *Journal of Mathematical Physics*, 46(2):023501, feb 2005.
- [124] Markus Giffthaler, Thomas Wolf, Heiko Panzer, and Boris Lohmann. Parametric model order reduction of port-hamiltonian systems by matrix interpolation. *Automatisierungstechnik*, 62(9):619–628, 2014.
- [125] Karsten Gimre, Christine Guenther, and James Isenberg. A geometric introduction to the two-loop renormalization group flow. *Journal of Fixed Point Theory and Applications*, 14(1):3–20, sep 2013.
- [126] K. Glover. Model reduction: A tutorial on hankel-norm methods and lower bounds on l_2 errors. *IFAC Proceedings Volumes*, 20(5):293–298, jul 1987.
- [127] Christopher John Goddard. Advanced topics in information dynamics. 2010.
- [128] Hubert F. M. Goenner. On the history of unified field theories. In *Living reviews in relativity*, 2004.
- [129] Jayadeep Gopalakrishnan, F. Li, Ngoc Cuong Nguyen, and Jaime Peraire. Spectral approximations by the HDG method. *Math. Comput.*, 84(293):1037–1059, 2015.
- [130] Martin A. Grepl, Yvon Maday, Ngoc C. Nguyen, and Anthony T. Patera. Efficient reduced-basis treatment of nonaffine and nonlinear partial differential equations. *ESAIM: Mathematical Modelling and Numerical Analysis*, 41(3):575–605, may 2007.
- [131] Stanley Gudder. Quantum markov chains. *Journal of Mathematical Physics*, 49(7):072105, 2008.
- [132] Carlos Guestrin, Daphne Koller, and Ronald Parr. Multiagent planning with factored mdps. In *NIPS*, 2001.
- [133] Carlos Guestrin, Daphne Koller, Ronald Parr, and Shobha Venkataraman. Efficient solution algorithms for factored mdps. *CoRR*, abs/1106.1822, 2011.
- [134] Serkan Gugercin, Rostyslav V. Polyuga, Christopher A. Beattie, and Arjan van der Schaft. Interpolation-based H_2 model reduction for port-hamiltonian systems. In *CDC*, pages 5362–5369. IEEE, 2009.
- [135] Serkan Gugercin and Karen Willcox. Krylov projection framework for fourier model reduction. *Automatica*, 44(1):209–215, 2008.
- [136] Mengwu Guo and Jan S. Hesthaven. Reduced order modeling for nonlinear structural analysis using gaussian process regression. *Computer Methods in Applied Mechanics and Engineering*, 341:807–826, nov 2018.

- [137] Ankit Gupta, Corentin Briat, and Mustafa Khammash. A scalable computational framework for establishing long-term behavior of stochastic reaction networks. *PLoS Computational Biology*, 10(6), 2014.
- [138] Sanjiv Kumar Gupta and Kathryn E. Hare. The absolute continuity of convolutions of orbital measures in symmetric spaces. *Journal of Mathematical Analysis and Applications*, 450(1):81–111, jun 2017.
- [139] R. N. GUTENKUNST, F. P. CASEY, J. J. WATERFALL, C. R. MYERS, and J. P. SETHNA. Extracting falsifiable predictions from sloppy models. *Annals of the New York Academy of Sciences*, 1115(1):203–211, oct 2007.
- [140] Ryan N. Gutenkunst and James P Sethna. Adaptive mutation of biochemical reaction constants: Fisher’s geometrical model without pleiotropy. 2010.
- [141] Ryan N. Gutenkunst, Joshua J. Waterfall, Fergal P. Casey, Kevin S. Brown, Christopher R. Myers, and James P. Sethna. Universally sloppy parameter sensitivities in systems biology models. *PLoS Computational Biology*, 3(10), 2007.
- [142] KS Hammon and LK Norris. New geometrical approach to rainich-misner-wheeler theory. *International journal of theoretical physics*, 29(3):253–267, 1990.
- [143] Song Han, Jeff Pool, Sharan Narang, Huizi Mao, Enhao Gong, Shijian Tang, Erich Elsen, Peter Vajda, Manohar Paluri, John Tran, Bryan Catanzaro, and William J. Dally. DSD: dense-sparse-dense training for deep neural networks. In *ICLR*. OpenReview.net, 2017.
- [144] Lucien Hardy. Foliabile operational structures for general probabilistic theories. In Hans Halvorson, editor, *Deep Beauty*, pages 409–442. Cambridge University Press.
- [145] Milos Hauskrecht and Branislav Kveton. Linear program approximations for factored continuous-state markov decision processes. In *NIPS*, pages 895–902. MIT Press, 2003.
- [146] Hao He, Bo Xin, and David Wipf. From sparse bayesian learning to deep recurrent nets. *NIPS*, 2017.
- [147] Jonathan J. Heckman. Statistical inference and string theory. *International Journal of Modern Physics A*, 30(26):1550160, sep 2015.
- [148] Claudio Hermida and Bart Jacobs. Fibrations with indeterminates: Contextual and functional completeness for polymorphic lambda calculi. *Mathematical Structures in Computer Science*, 5(4):501–531, 1995.
- [149] Dudley R. Herschbach, Harold S. Johnston, and Donald Rapp. Molecular partition functions in terms of local properties. *The Journal of Chemical Physics*, 31(6):1652–1661, dec 1959.
- [150] John R. Hershey, Jonathan Le Roux, and Felix Weninger. Deep unfolding: Model-based inspiration of novel deep architectures. *CoRR*, abs/1409.2574, 2014.
- [151] H. Hoang, F. Couenne, C. Jallut, and Y. Le Gorrec. The port hamiltonian approach to modeling and control of continuous stirred tank reactors. *Journal of Process Control*, 21(10):1449–1458, dec 2011.
- [152] Simon Hochgerner. A hamiltonian mean field system for the navier–stokes equation. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Science*, 474(2218):20180178, oct 2018.
- [153] Janos Prof Dr Hollo and Tamás Lengyel. Development and use of a three-suffix scatchard-hamer equation for quaternary systems. 1961.
- [154] Michael Holmes, Alexander Gray, and Charles Isbell. Fast svd for large-scale matrices. In *Workshop on Efficient Machine Learning at NIPS*, volume 58, pages 249–252, 2007.
- [155] Gerardt Hooft. THE CONCEPTUAL BASIS OF QUANTUM FIELD THEORY. In *Philosophy of Physics*, pages 661–729. Elsevier, 2007.
- [156] Stefan Horst. Math in the cabin - shape analysis workshop in bad gastein. 2015.
- [157] Hisham Husain, Zac Cranko, and Richard Nock. Integral privacy for sampling from mollifier densities with approximation guarantees. 2018.
- [158] Shin itiro Goto. Legendre submanifolds in contact manifolds as attractors and geometric nonequilibrium thermodynamics. *Journal of Mathematical Physics*, 56(7):073301, jul 2015.
- [159] Shin itiro Goto. Contact geometric description of distributed-parameter port-hamiltonian systems with respect to stokes-dirac structures and its information geometry. 2017.

- [160] Shin itiro Goto. Maxwell’s equations in media as a contact hamiltonian vector field and its information geometry – an approach with a bundle whose fiber is a contact manifold. 2017.
- [161] Prateek Jain, Ambuj Tewari, and Purushottam Kar. On iterative hard thresholding methods for high-dimensional m-estimation. In *NIPS*, 2014.
- [162] Václav Janis. Introduction to mean-field theory of spin glass models. 2015.
- [163] Dimitri Jeltsema and Arnau Dòria-Cerezo. Port-hamiltonian formulation of systems with memory. *Proceedings of the IEEE*, 100(6):1928–1937, 2012.
- [164] Xiaojie Jin, Xiaotong Yuan, Jiashi Feng, and Shuicheng Yan. Training skinny deep neural networks with iterative hard thresholding methods. *CoRR*, abs/1607.05423, 2016.
- [165] Robert Jongschaap and Hans Christian Öttinger. The mathematical representation of driven thermodynamic systems. *Journal of Non-Newtonian Fluid Mechanics*, 120(1-3):3–9, jul 2004.
- [166] Arun Kaintura, Tom Dhaene, and Domenico Spina. Review of polynomial chaos-based methods for uncertainty quantification in modern integrated circuits. *Electronics*, 7(3):30, feb 2018.
- [167] S. Kakutani. Representation of measurable flows in euclidean 3-space. *Proceedings of the National Academy of Sciences*, 28(1):16–21, jan 1942.
- [168] Ulugbek S. Kamilov and Hassan Mansour. Learning optimal nonlinearities for iterative thresholding algorithms. *IEEE Signal Process. Lett.*, 23(5):747–751, 2016.
- [169] Kyungsik Kang and Igor Kondrashuk. Semiclassical scattering amplitudes of dressed gravitons. *arXiv preprint hep-ph/0408168*, 2004.
- [170] Sayan Kar. Geometry of renormalization group flows in theory space. *Physical Review D*, 64(10):105017, 2001.
- [171] Robert E Kass. The geometry of asymptotic inference. *Statistical Science*, pages 188–219, 1989.
- [172] Min Ke, Zhou Fang, and Chuanhou Gao. Complex balancing reconstructed to the asymptotic stability of mass-action chemical reaction networks with conservation laws. *SIAM Journal of Applied Mathematics*, 79(1):55–74, 2019.
- [173] Michael J. Kearns and Satinder P. Singh. Near-optimal reinforcement learning in polynomial time. *Machine Learning*, 49(2-3):209–232, 2002.
- [174] Varun Khare. Robust single layer neural network.
- [175] B. Khesin, J. Lenells, G. Misiołek, and S. C. Preston. Geometry of diffeomorphism groups, complete integrability and geometric statistics. *Geometric and Functional Analysis*, 23(1):334–366, feb 2013.
- [176] Kee-Eung Kim and Thomas L. Dean. Solving factored mdps with large action space using algebraic decision diagrams. In *PRICAI*, volume 2417 of *Lecture Notes in Computer Science*, pages 80–89. Springer, 2002.
- [177] Kee-Eung Kim, Thomas L. Dean, and Nicolas Meuleau. Approximate solutions to factored markov decision processes via greedy search in the space of finite state controllers. In *AIPS*, 2000.
- [178] Michael J Kirby and Arthur A Jamshidi. Nonlinear function approximation over high-dimensional domains, October 25 2011. US Patent 8,046,200.
- [179] Andrzej Klein. Matrix algebraic properties of the fisher information matrix of stationary processes. *Entropy*, 16(4):2023–2055, 2014.
- [180] A. A. Klyachko. Stable bundles, representation theory and hermitian operators. *Selecta Mathematica*, 4(3):419–445, sep 1998.
- [181] Daphne Koller and Ronald Parr. Policy iteration for factored mdps. *CoRR*, abs/1301.3869, 2013.
- [182] Paul Kotyczka. On the feedforward control problem for discretized port-hamiltonian systems. *IFAC Proceedings Volumes*, 47(3):652–658, 2014.
- [183] Paul Kotyczka, Bernhard Maschke, and Laurent Lefèvre. Weak form of stokes-dirac structures and geometric discretization of port-hamiltonian systems. *J. Comput. Physics*, 361:442–476, 2018.
- [184] Boris Kramer and Karen Willcox. Nonlinear model order reduction via lifting transformations and proper orthogonal decomposition. *CoRR*, abs/1808.02086, 2018.

- [185] M. I. Krivoruchenko and Amand Faessler. Weyl’s symbols of heisenberg operators of canonical coordinates and momenta as quantum characteristics. *Journal of Mathematical Physics*, 48(5):052107, may 2007.
- [186] Finny Kuruvilla. Representation theory and physical systems. 1998.
- [187] Rami Lam and Karen Willcox. Lookahead bayesian optimization with inequality constraints. In *NIPS*, pages 1888–1898, 2017.
- [188] Rami Lam, Karen Willcox, and David H. Wolpert. Bayesian optimization with a finite budget: An approximate dynamic programming approach. In *NIPS*, pages 883–891, 2016.
- [189] Eliana Lambrou, Luigi Del Debbio, R. D. Kenway, and Enrico Rinaldi. Searching for a continuum 4d field theory arising from a 5d non-abelian gauge theory. In *Proceedings of 31st International Symposium on Lattice Field Theory LATTICE 2013 — PoS(LATTICE 2013)*. Sissa Medialab, apr 2014.
- [190] Joan-Andreu Lázaro-Camí and Juan-Pablo Ortega. Stochastic hamiltonian dynamical systems. *Reports on Mathematical Physics*, 61(1):65–122, feb 2008.
- [191] Dennis Lehmkuhl. General relativity as a hybrid theory: The genesis of einsteins work on the problem of motion. *Studies in History and Philosophy of Science Part B: Studies in History and Philosophy of Modern Physics*, nov 2017.
- [192] Alexandre L. M. Levada. Learning from complex systems: On the roles of entropy and fisher information in pairwise isotropic gaussian markov random fields. *Entropy*, 16(2):1002–1036, 2014.
- [193] Jinglai Li and Youssef M. Marzouk. Adaptive construction of surrogates for the bayesian solution of inverse problems. *SIAM Journal on Scientific Computing*, 36(3):A1163–A1186, jan 2014.
- [194] Wuchen Li. Geometry of probability simplex via optimal transport. 2018.
- [195] Tengyuan Liang, Tomaso Poggio, Alexander Rakhlin, and James Stokes. Fisher-rao metric, geometry, and complexity of neural networks. *arXiv preprint arXiv:1711.01530*, 2017.
- [196] Chungpin Liao. Light-enhanced gravitational constant g . *European international journal of science and technology*, Vol. 3:31, 01 2014.
- [197] D.A Lind. Locally compact measure preserving flows. *Advances in Mathematics*, 15(2):175–193, feb 1975.
- [198] Henning Lindhorst and Steffen Waldherr. Modeling chemical reaction networks on the pontryagin bundle with the hamilton-pontryagin approach. *IFAC-PapersOnLine*, 48(1):47–52, 2015.
- [199] György Lipták. *Analysis and control of nonnegative polynomial systems= Nemnegatív polinomiális rendszerek analízise és irányítása*. PhD thesis, Pannon Egyetem, 2018.
- [200] György Lipták, Gábor Szederkényi, and Katalin M. Hangos. Hamiltonian feedback design for mass action law chemical reaction networks. *IFAC-PapersOnLine*, 48(13):158–163, 2015.
- [201] György Lipták, Gábor Szederkényi, and Katalin M. Hangos. Kinetic feedback design for polynomial systems. *Journal of Process Control*, 41:56–66, may 2016.
- [202] György Lipták, Gábor Szederkényi, and Katalin M. Hangos. Computing zero deficiency realizations of kinetic systems. *Systems & Control Letters*, 81:24–30, 2015.
- [203] J. K. Liu and Shengjie Li. New hybrid conjugate gradient method for unconstrained optimization. *Applied Mathematics and Computation*, 245:36–43, 2014.
- [204] John Loftin. Affine hermitian-einstein metrics. *Asian Journal of Mathematics*, 13(1):101–130, 2009.
- [205] Stephen Michael Lord. Set of processes for removing impurities from a silicon production facility, September 7 2010. US Patent 7,790,129.
- [206] Ilya Loshchilov. *Surrogate-assisted evolutionary algorithms*. PhD thesis, Université Paris Sud-Paris XI; Institut national de recherche en , 2013.
- [207] Ilya Loshchilov and Frank Hutter. CMA-ES for hyperparameter optimization of deep neural networks. *CoRR*, abs/1604.07269, 2016.
- [208] A. Macchelli, S. Stramigioli, A. van der Schaft, and C. Melchiorri. Scattering for infinite dimensional port hamiltonian systems. In *Proceedings of the 41st IEEE Conference on Decision and Control, 2002*. IEEE.

- [209] B. B. Machta, R. Chachra, M. K. Transtrum, and J. P. Sethna. Parameter space compression underlies emergent theories and predictive models. *Science*, 342(6158):604–607, oct 2013.
- [210] Attila Magyar and Katalin M. Hangos. Control lyapunov function based feedback design for quasi-polynomial systems. In *NOLCOS*, pages 128–133. International Federation of Automatic Control, 2013.
- [211] Algirdas Antano Maknickas. Biefeld-brown effect and space curvature of electromagnetic field. *Journal of Modern Physics*, 04(08):105–110, 2013.
- [212] Luigi Malagò, Luigi Montrucchio, and Giovanni Pistone. Wasserstein riemannian geometry of gaussian densities. *Information Geometry*, 1(2):137–179, 2018.
- [213] Luigi Malagò and Giovanni Pistone. Combinatorial optimization with information geometry: The newton method. *Entropy*, 16(8):4260–4289, 2014.
- [214] Luigi Malagò and Giovanni Pistone. Gradient flow of the stochastic relaxation on a generic exponential family. AIP Publishing LLC, 2015.
- [215] Luigi Malagò and Giovanni Pistone. Information geometry of the gaussian distribution in view of stochastic optimization. In *FOGA*, pages 150–162. ACM, 2015.
- [216] Jonathan H. Manton. Optimisation geometry. 2012.
- [217] Umberto Marini Bettolo Marconi and Pedro Tarazona. Dynamic density functional theory of fluids. 1999.
- [218] Eyal Markman. Spectral curves and integrable systems. *Compositio mathematica*, 93(3):255–290, 1994.
- [219] Charles-Michel Marle. From tools in symplectic and poisson geometry to j.-m. souriau’s theories of statistical mechanics and thermodynamics. *Entropy*, 18(10):370, oct 2016.
- [220] Alexandre Noll Marques, Rami Lam, and Karen Willcox. Contour location via entropy reduction leveraging multiple information sources. In *NeurIPS*, pages 5223–5233, 2018.
- [221] Davit Martirosyan and Vahagn Nersesyan. Multiplicative ergodic theorem for a non-irreducible random dynamical system. 2018.
- [222] K.A. Masavetas and F. Roumpani-Kalantzopoulou. Categories and functors which characterize chemical reactions, their kinetics and mechanism. *Mathematical and Computer Modelling*, 10(10):731–738, 1988.
- [223] François Maucourant and Barbara Schapira. On topological and measurable dynamics of unipotent frame flows for hyperbolic manifolds. *Duke Mathematical Journal*, 168(4):697–747, mar 2019.
- [224] Christian Mehl, Volker Mehrmann, and Punit Sharma. Structured distances to instability for linear hamiltonian systems with dissipation. Technical report, Technical Report 1377, DFG Research Center MATHEON, Mathematics for key , 2016.
- [225] Nathaniel J Merrill, Zheming An, Sean T McQuade, Federica Garin, Karim Azer, Ruth E Abrams, and Benedetto Piccoli. Stability of metabolic networks via linear-in-flux-expressions. *arXiv preprint arXiv:1808.08263*, 2018.
- [226] Igor Mezić. Spectral properties of dynamical systems, model reduction and decompositions. *Nonlinear Dynamics*, 41(1-3):309–325, aug 2005.
- [227] Igor Mezić and Stephen Wiggins. A method for visualization of invariant sets of dynamical systems based on the ergodic partition. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 9(1):213–218, mar 1999.
- [228] Guoping Miao. *Comparison of Backpropagation and Conjugate Gradient Algorithms for Efficient Training of Multilayer Perceptron Networks*. PhD thesis, Oklahoma State University, 2002.
- [229] Charles W Misner and John A Wheeler. Classical physics as geometry. *Annals of physics*, 2(6):525–603, 1957.
- [230] Sophia Mitchell, Nicholas D. Ernest, and Kelly Cohen. Comparison of fuzzy optimization and genetic fuzzy methods in solving a modified traveling salesman problem. American Institute of Aeronautics and Astronautics, aug 2013.
- [231] Klas Modin. Generalized hunter–saxton equations, optimal information transport, and factorization of diffeomorphisms. *The Journal of Geometric Analysis*, 25(2):1306–1334, feb 2014.
- [232] Andrey Mokhov. Algebraic graphs with class (functional pearl). In *Haskell*, pages 2–13. ACM, 2017.
- [233] Mathieu Molitor. Information geometry and the hydrodynamical formulation of quantum mechanics. 2012.

- [234] Martin F. Møller. A scaled conjugate gradient algorithm for fast supervised learning. *DAIMI Report Series*, 19(339), nov 1990.
- [235] Alex Monras, Almut Beige, and Karoline Wiesner. Hidden quantum markov models and non-adaptive read-out of many-body states. 2010.
- [236] Guido Mont'ufar. Universal approximation of markov kernels by shallow stochastic feedforward networks. *CoRR*, abs/1503.07211, 2015.
- [237] Yves Moreau and Joos Vandewalle. Modeling dynamical systems using compositions 1 modeling dynamical systems using compositions. 1997.
- [238] J. J. Mortensen, K. Kaasbjerg, S. L. Frederiksen, J. K. Nørskov, J. P. Sethna, and K. W. Jacobsen. Bayesian error estimation in density-functional theory. *Physical Review Letters*, 95(21), nov 2005.
- [239] Kevin P. Murphy, Yair Weiss, and Michael I. Jordan. Loopy belief propagation for approximate inference: An empirical study. *CoRR*, abs/1301.6725, 2013.
- [240] Ibrahim Mutlay. Hydrodynamics of the rotating spherical matter fields and atomic structure. 2010.
- [241] Nazri Mohd Nawi, RS Ransing, and MR Ransing. An improved conjugate gradient based learning algorithm for back propagation neural networks. *International Journal of Computational Intelligence*, 4(1):46–55, 2007.
- [242] Radford Neal. MCMC using hamiltonian dynamics. In *Chapman & Hall/CRC Handbooks of Modern Statistical Methods*. Chapman and Hall/CRC, may 2011.
- [243] Nikita Nekrasov. Holomorphic bundles and many-body systems. *Communications in Mathematical Physics*, 180(3):587–603, oct 1996.
- [244] Ngoc-Cuong Nguyen and Yanlai Chen. Reduced-basis method for the iterative solution of parametrized symmetric positive-definite linear systems. *arXiv preprint arXiv:1804.06363*, 2018.
- [245] Ngoc Cuong Nguyen, Pablo Fern'andez, Robert M. Freund, and Jaime Peraire. Accelerated residual methods for the iterative solution of systems of equations. *SIAM J. Scientific Computing*, 40(5):A3157–A3179, 2018.
- [246] Ngoc Cuong Nguyen and Jaume Peraire. Hybridizable discontinuous galerkin methods for partial differential equations in continuum mechanics. *J. Comput. Physics*, 231(18):5955–5988, 2012.
- [247] G. Nishida and M. Yamakita. A higher order stokes-dirac structure for distributed-parameter port-hamiltonian systems. In *Proceedings of the 2004 American Control Conference*. IEEE, 2004.
- [248] Anna Nissen, Katharina Kormann, Magnus Grandin, and Kristoffer Virta. Stable difference methods for block-oriented adaptive grids. *J. Sci. Comput.*, 65(2):486–511, 2015.
- [249] Anthony Nouy. Recent developments in spectral stochastic methods for the numerical solution of stochastic partial differential equations. *Archives of Computational Methods in Engineering*, 16(3):251–285, may 2009.
- [250] Nurul Retno Nurwulan and Bernard C. Jiang. Possibility of using entropy method to evaluate the distracting effect of mobile phones on pedestrians. *Entropy*, 18(11):390, 2016.
- [251] Andrew Nystrom and John Hughes. Leveraging sparsity to speed up polynomial feature expansions of CSR matrices using k-simplex numbers. *CoRR*, abs/1803.06418, 2018.
- [252] Ognian Oreshkov and Nicolas J. Cerf. Operational formulation of time reversal in quantum theory. *Nature Physics*, 11(10):853–858, jul 2015.
- [253] R. Ortega, A. van der Schaft, B. Maschke, and G. Escobar. Energy-shaping of port-controlled hamiltonian systems by interconnection. In *Proceedings of the 38th IEEE Conference on Decision and Control (Cat. No.99CH36304)*. IEEE.
- [254] Romeo Ortega, Arjan van der Schaft, Fernando Castaños, and Alessandro Astolfi. CONTROL BY (STATE-MODULATED) INTERCONNECTION OF PORT-HAMILTONIAN SYSTEMS. *IFAC Proceedings Volumes*, 40(12):28–35, 2007.
- [255] Román Orús, Samuel Mugel, and Enrique Lizaso. Quantum computing for finance: Overview and prospects. *Reviews in Physics*, 4:100028, nov 2019.
- [256] T A Osborn, M F Kondrateva, G C Tabisz, and B R McQuarrie. Mixed weyl symbol calculus and spectral line shape theory. *Journal of Physics A: Mathematical and General*, 32(22):4149–4169, jan 1999.

- [257] Valery Iustynovich Oseledets. A multiplicative ergodic theorem. characteristic lyapunov, exponents of dynamical systems. *Trudy Moskovskogo Matematicheskogo Obshchestva*, 19:179–210, 1968.
- [258] George F. Oster, Alan S. Perelson, and Aharon Katchalsky. Network thermodynamics. *Nature*, 237:332–333, 1972.
- [259] Masanao Ozawa. Conditional probability and a posteriori states in quantum mechanics. *Publications of the Research Institute for Mathematical Sciences*, 21(2):279–295, 1985.
- [260] Ross Paterson. Arrows and computation. In *The Fun of Programming*, pages 201–222. Macmillan Education UK, 2003.
- [261] Benjamin Peherstorfer, Max Gunzburger, and Karen Willcox. Convergence analysis of multifidelity monte carlo estimation. *Numerische Mathematik*, 139(3):683–707, 2018.
- [262] Benjamin Peherstorfer, Boris Kramer, and Karen Willcox. Combining multiple surrogate models to accelerate failure probability estimation with expensive high-fidelity models. *J. Comput. Physics*, 341:61–75, 2017.
- [263] Benjamin Peherstorfer and Karen Willcox. Detecting and adapting to parameter changes for reduced models of dynamic data-driven application systems. In *ICCS*, volume 51 of *Procedia Computer Science*, pages 2553–2562. Elsevier, 2015.
- [264] Benjamin Peherstorfer and Karen Willcox. Dynamic data-driven model reduction: adapting reduced models from incomplete data. *Adv. Model. and Simul. in Eng. Sciences*, 3(1):11:1–11:22, 2016.
- [265] Benjamin Peherstorfer, Karen Willcox, and Max Gunzburger. Survey of multifidelity methods in uncertainty propagation, inference, and optimization. *SIAM Review*, 60(3):550–591, 2018.
- [266] Tiago P. Peixoto. Bayesian stochastic blockmodeling. 2017.
- [267] Javier L’opez Pena. Connections over twisted tensor products of algebras. 2006.
- [268] Vipul Periwal. The renormalization flow, spaces of two-dimensional field theories, and connes geometry. *Communications in Mathematical Physics*, 120(1):71–95, mar 1988.
- [269] WKS Phoa and Paul Taylor. The synthetic plotkin powerdomain. *preprint*, 1990.
- [270] Rostyslav V. Polyuga and Arjan van der Schaft. Effort- and flow-constraint reduction methods for structure preserving model reduction of port-hamiltonian systems. *Systems & Control Letters*, 61(3):412–421, 2012.
- [271] Ali Poursaeidesfahani, Ahmadreza Rahbari, Ariana Torres-Knoop, David Dubbeldam, and Thijs J. H. Vlugt. Computation of thermodynamic properties in the continuous fractional component monte carlo gibbs ensemble. *Molecular Simulation*, 43(3):189–195, dec 2016.
- [272] John Power and Hayo Thielecke. Closed freyd- and kappa-categories. In *ICALP*, volume 1644 of *Lecture Notes in Computer Science*, pages 625–634. Springer, 1999.
- [273] Robert T. Powers. Self-adjoint algebras of unbounded operators. *Communications in Mathematical Physics*, 21(2):85–124, jun 1971.
- [274] Serge Preston et al. The indefinite metric of r. mrugala and the geometry of the thermodynamical phase space. *arXiv preprint math/0509267*, 2005.
- [275] Vladimir Prochazka. The conformal anomaly in bCFT from momentum space perspective. *Journal of High Energy Physics*, 2018(10), oct 2018.
- [276] Charles Pugh and Michael Shub. Stably ergodic dynamical systems and partial hyperbolicity. *J. Complexity*, 13(1):125–179, 1997.
- [277] Hernando Quevedo. Geometrothermodynamics. *Journal of Mathematical Physics*, 48(1):013506, jan 2007.
- [278] Katherine N Quinn, Colin B Clement, Francesco De Bernardis, Michael D Niemack, and James P Sethna. Visualizing probabilistic models: Intensive principal component analysis. *arXiv preprint arXiv:1810.02877*, 2018.
- [279] Katherine N. Quinn, Heather Wilber, Alex Townsend, and James P. Sethna. Chebyshev approximation and the global geometry of sloppy models. *CoRR*, abs/1809.08280, 2018.
- [280] M. O. Rabin and D. Scott. Finite automata and their decision problems. *IBM Journal of Research and Development*, 3(2):114–125, apr 1959.
- [281] O. Radulescu, S. Vakulenko, and D. Grigoriev. Model reduction of biochemical reactions networks by tropical analysis methods. *Mathematical Modelling of Natural Phenomena*, 10(3):124–138, 2015.

- [282] Sandeep Kumar Raghuwanshi and Rajesh Kumar Pateriya. Accelerated singular value decomposition (ASVD) using momentum based gradient descent optimization. *Journal of King Saud University - Computer and Information Sciences*, mar 2018.
- [283] G. Y. Rainich. Electrodynamics in the general relativity theory. *Transactions of the American Mathematical Society*, 27(1):106, jan 1925.
- [284] Archishman Raju, Colin B. Clement, Lorian X. Hayden, Jaron P. Kent-Dobias, Danilo Barbosa Liarte, D Zeb Rocklin, and James P Sethna. Normal form for renormalization groups. 2018.
- [285] Archishman Raju, Benjamin B. Machta, and James P. Sethna. Information loss under coarse graining: A geometric approach. *Physical Review E*, 98(5), nov 2018.
- [286] Archishman Raju and James P Sethna. Reexamining the renormalization group: Period doubling onset of chaos. *arXiv preprint arXiv:1807.09517*, 2018.
- [287] Hector Ramirez, Bernhard Maschke, and Daniel Sbarbaro. Irreversible port-hamiltonian systems: A general formulation of irreversible processes with application to the CSTR. *Chemical Engineering Science*, 89:223–234, feb 2013.
- [288] Shodhan Rao, Bayu Jayawardhana, and Arjan van der Schaft. Model reduction of detailed-balanced reaction networks by clustering linkage classes. *IFAC-PapersOnLine*, 49(26):219–224, 2016.
- [289] Shodhan Rao, Arjan van der Schaft, and Bayu Jayawardhana. A graph-theoretical approach for the analysis and model reduction of complex-balanced chemical reaction networks. *CoRR*, abs/1211.6643, 2012.
- [290] Shodhan Rao, Arjan van der Schaft, and Bayu Jayawardhana. Open complex-balanced mass action chemical reaction networks. In *Proceedings of the 21st International Symposium on Mathematical Theory of Networks and Systems*, 7 2014.
- [291] Shodhan Rao, Arjan van der Schaft, Karen van Eunen, Barbara M. Bakker, and Bayu Jayawardhana. Model-order reduction of biochemical reaction networks. In *ECC*, pages 4502–4507. IEEE, 2013.
- [292] P. Rapisarda and J.C. Mayo Maldonado. On higher-order linear port-hamiltonian systems and their duals ***this research has been carried out during a visit of the first author to tecnológico de monterrey made possible by the royal academy of newton research collaboration programme grant no. NRC P1516/1/17.* *IFAC – PapersOnLine*, 50(1) : 9236 – 9241, jul 2017.
- [293] Paolo Rapisarda and Arjan van der Schaft. Identification and data-driven reduced-order modeling for linear conservative port- and self-adjoint hamiltonian systems. In *CDC*, pages 145–150. IEEE, 2013.
- [294] M Rasetti and E Merelli. The topological field theory of data: a program towards a novel strategy for data mining through data language. *Journal of Physics: Conference Series*, 626:012005, jul 2015.
- [295] Alejandro M. F. Rivas. Semiclassical coherent-states propagator. *Physical Review A*, 88(1), jul 2013.
- [296] Bruce W. Roberts, Eberhard Bodenschatz, and James P Sethna. Defect–defect correlation functions, generic scale invariance, and the complex ginzburg–landau equation. 1994.
- [297] C. C. Rodriguez. Optimal recovery of local truth. In *AIP Conference Proceedings*. AIP, 2001.
- [298] Ian Roulstone, Beatriz García Baños, John D. Gibbon, and Vladimir Roubtsov. Kähler geometry and the navier-stokes equations. 2005.
- [299] Ian Roulstone, Beatriz García Baños, John D. Gibbon, and Vladimir Roubtsov. Kahler geometry and burgers’ vortices. 2009.
- [300] Gianluigi Rozza and Karen Veroy. On the stability of the reduced basis method for stokes equations in parametrized domains. *Computer Methods in Applied Mechanics and Engineering*, 196(7):1244–1260, jan 2007.
- [301] George Ruppeiner. Unitary thermodynamics from thermodynamic geometry. *Journal of Low Temperature Physics*, 174(1-2):13–34, oct 2013.
- [302] P. Salamon, J.D. Nulton, G. Siragusa, T.R. Andersen, and A. Limon. ”principles of control thermodynamics”. *Energy*, 26(3):307 – 319, 2001.
- [303] Brian Sallans. Learning factored representations for partially observable markov decision processes. In *NIPS*, pages 1050–1056. The MIT Press, 1999.

- [304] Brian Sallans and GE Hinton. *Reinforcement learning for factored markov decision processes*. University of Toronto, 2002.
- [305] Brian Sallans and Geoffrey E. Hinton. Reinforcement learning with factored states and actions. *Journal of Machine Learning Research*, 5:1063–1088, 2004.
- [306] Scott Sanner and Craig Boutilier. Practical solution techniques for first-order mdps. *Artif. Intell.*, 173(5-6):748–788, 2009.
- [307] Manuel Santoro and Albert Steven Benight. On the geometrical thermodynamics of chemical reactions. 2005.
- [308] W. C. Santos. Introduction to einstein-maxwell equations and the rainich conditions. 2016.
- [309] OMRI M. SARIG. Thermodynamic formalism for countable markov shifts. *Ergodic Theory and Dynamical Systems*, 19(6):1565–1593, dec 1999.
- [310] Anoop Sathyan, Nicholas D. Ernest, and Kelly Cohen. Genetic fuzzy approach for control and task planning applications. American Institute of Aeronautics and Astronautics, jan 2015.
- [311] J SchaftvanderArjan and Joaquín Cervera. Composition of dirac structures and control of port-hamiltonian systems. 2002.
- [312] M. Schöberl and K. Schlacher. Port-hamiltonian formulation for higher-order PDEs. *IFAC-PapersOnLine*, 48(13):244–249, 2015.
- [313] M. Schöberl and A. Siuka. On the port-hamiltonian representation of systems described by partial differential equations. *IFAC Proceedings Volumes*, 45(19):1–6, 2012.
- [314] K. Schlacher and M. Schöberl. How to choose the state for distributed-parameter systems, a geometric point of view. *IFAC-PapersOnLine*, 48(1):500–501, 2015.
- [315] Markus Schöberl and Andreas Siuka. On casimir functionals for infinite-dimensional port-hamiltonian control systems. *IEEE Trans. Automat. Contr.*, 58(7):1823–1828, 2013.
- [316] Markus Schöberl and Andreas Siuka. Jet bundle formulation of infinite-dimensional port-hamiltonian systems using differential operators. *Automatica*, 50(2):607–613, 2014.
- [317] Julian Schwinger. A theory of the fundamental interactions. In *Selected Papers (1937 – 1976) of Julian Schwinger*, pages 78–105. Springer Netherlands, 1979.
- [318] Irving E Segal. Irreducible representations of operator algebras. *Bulletin of the American Mathematical Society*, 53(2):73–88, 1947.
- [319] Santiago Segarra, Michael T. Schaub, and Ali Jadbabaie. Network inference from consensus dynamics. In *CDC*, pages 3212–3217. IEEE, 2017.
- [320] P. Sémon, G. Sordi, and A.-M. S. Tremblay. Ergodicity of the hybridization-expansion monte carlo algorithm for broken-symmetry states. *Physical Review B*, 89(16), apr 2014.
- [321] Marko Seslija, Jacquélien M. A. Scherpen, and Arjan van der Schaft. A discrete exterior approach to structure-preserving discretization of distributed-parameter port-hamiltonian systems. In *CDC-ECE*, pages 7003–7008. IEEE, 2011.
- [322] Marko Seslija, Jacquélien M. A. Scherpen, and Arjan van der Schaft. Explicit simplicial discretization of distributed-parameter port-hamiltonian systems. *Automatica*, 50(2):369–377, 2014.
- [323] Yuanlong Shao. Learning sparse recurrent neural networks in language modeling. 2014.
- [324] Manuel Silva, J Ribeiro, João Carmo, L.M. Goncalves, and J.H. Correia. *Thin Films for Thermoelectric Applications*, pages 485–528. 01 2013.
- [325] Andreas Siuka. *Geometry, modelling and control of infinite dimensional port-Hamiltonian systems*. na, 2011.
- [326] Primož Skraba. Persistent homology and machine learning. *Informatica (Slovenia)*, 42(2), 2018.
- [327] Stephen Smale. Regular curves on riemannian manifolds. *Transactions of the American Mathematical Society*, 87(2):492, mar 1958.
- [328] J.C. Solem and L.R. Veaser. Exploratory laser-driven shock wave studies. Technical report, nov 1977.

- [329] David I Spivak. The steady states of coupled dynamical systems compose according to matrix arithmetic. *arXiv preprint arXiv:1512.00802*, 2015.
- [330] Tjerk Stegink, Claudio De Persis, and A. J. van der Schaft. An energy-based analysis of reduced-order models of (networked) synchronous machines. *CoRR*, abs/1809.05019, 2018.
- [331] Meiyu Su. The information topology and true laminations for diffeomorphisms. *Conformal Geometry and Dynamics of the American Mathematical Society*, 8(2):36–51, 2004.
- [332] Ke Sun, Jun Wang, Alexandros Kalousis, and Stéphane Marchand-Maillet. Information geometry and minimum description length networks. In *ICML*, volume 37 of *JMLR Workshop and Conference Proceedings*, pages 49–58. JMLR.org, 2015.
- [333] VS Sunder. von neumann algebras and ergodic theory. In *Perspectives In Mathematical Sciences II: Pure Mathematics*, pages 199–208. World Scientific, 2009.
- [334] Yoshihiko Susuki and Igor Mezic. Ergodic partition of phase space in continuous dynamical systems. In *CDC*, pages 7497–7502. IEEE, 2009.
- [335] Magnus Svärd. A new eulerian model for viscous and heat conducting compressible flows. *Physica A: Statistical Mechanics and its Applications*, 506:350–375, sep 2018.
- [336] Gábor Szederkényi. Computational analysis of nonnegative polynomial systems. 2014.
- [337] Gábor Szederkényi, Katalin M. Hangos, and Tamás Péni. Maximal and minimal realizations of reaction kinetic systems: computation and properties. 2011.
- [338] V. Talasila, J. Clemente-Gallardo, and A.J. van der Schaft. Discrete port-hamiltonian systems. *Systems & Control Letters*, 55(6):478–486, jun 2006.
- [339] V Talasila, G Golo, and AJ Van Der Schaft. The wave equation as a port-hamiltonian system and a finite dimensional approximation. In *Proceedings of 15th international symposium mathematical theory of networks and systems (MTNS), South Bend*, 2002.
- [340] Michael Teper and Helvio Vairinhos. Symmetry breaking in twisted eguchi-kawai models. *Physics Letters B*, 652(5-6):359–369, sep 2007.
- [341] Kazuto Tominaga, Tomoya Suzuki, and Kazuhiro Oka. An encoding scheme for generating -expressions in genetic programming. In *Genetic and Evolutionary Computation — GECCO 2003*, pages 1814–1815. Springer Berlin Heidelberg, 2003.
- [342] Mark K Transtrum, Benjamin B Machta, and James P Sethna. Why are nonlinear fits to data so challenging? *Physical review letters*, 104(6):060201, 2010.
- [343] Mark K. Transtrum, Benjamin B. Machta, and James P. Sethna. Geometry of nonlinear least squares with applications to sloppy models and optimization. *Physical Review E*, 83(3), mar 2011.
- [344] Roumen Tsekov. Dissipative and quantum mechanics. 2009.
- [345] Anastasios Tsourtis, Vagelis Harmandaris, and Dimitrios K. Tsagkarogiannis. Parameterization of coarse-grained molecular interactions through potential of mean force calculations and cluster expansion techniques. *Entropy*, 19(8):395, 2017.
- [346] Sergiu I. Vacaru. The entropy of lagrange-finsler spaces and ricci flows. *Reports on Mathematical Physics*, 63(1):95–110, feb 2009.
- [347] A. J. van der Schaft. Port-hamiltonian differential-algebraic systems. In *Surveys in Differential-Algebraic Equations I*, pages 173–226. Springer Berlin Heidelberg, 2013.
- [348] A. J. van der Schaft, Shodhan Rao, and Bayu Jayawardhana. A network dynamics approach to chemical reaction networks. *Int. J. Control*, 89(4):731–745, 2016.
- [349] Arjan van der Schaft. Port-controlled hamiltonian systems: towards a theory for control and design of nonlinear physical systems. 2000.
- [350] Arjan van der Schaft. Modeling of physical network systems. *Systems & Control Letters*, 101:21–27, 2017.

- [351] Arjan van der Schaft and Dimitri Jeltsema. Port-hamiltonian systems theory: An introductory overview. *Foundations and Trends® in Systems and Control*, 1(2):173–378, 2014.
- [352] Arjan van der Schaft and Bernhard Maschke. Generalized port-hamiltonian DAE systems. *Systems & Control Letters*, 121:31–37, 2018.
- [353] Arjan van der Schaft and Bernhard Maschke. Geometry of thermodynamic processes. *Entropy*, 20(12):925, 2018.
- [354] Arjan van der Schaft, S Rao, and B Jayawardhana. Formal balancing of chemical reaction networks.
- [355] Arjan van der Schaft, Shodhan Rao, and Bayu Jayawardhana. On the mathematical structure of balanced chemical reaction networks governed by mass action kinetics. *SIAM Journal of Applied Mathematics*, 73(2):953–973, 2013.
- [356] Arjan van der Schaft, Shodhan Rao, and Bayu Jayawardhana. Complex and detailed balancing of chemical reaction networks revisited. *Journal of Mathematical Chemistry*, 53(6):1445–1458, apr 2015.
- [357] J. J. P. Veerman and E. Kummel. Diffusion and consensus on weakly connected directed graphs. *CoRR*, abs/1807.09846, 2018.
- [358] François-Xavier Vialard. On the wasserstein-fisher-rao metric. *MATH ON THE ROCKS*, page 4.
- [359] Christopher M Vigorito and Andrew G Barto. Incremental structure learning in factored mdps with continuous states and actions. *University of Massachusetts Amherst-Department of Computer Science, Tech. Rep*, 2009.
- [360] Jaak Vilms. Totally geodesic maps. *Journal of Differential Geometry*, 4(1):73–79, 1970.
- [361] Roland Vollgraf and Klaus Obermayer. Quadratic optimization for simultaneous matrix diagonalization. *IEEE Trans. Signal Processing*, 54(9):3270–3278, 2006.
- [362] Ngoc Minh Trang VU, Laurent LEFEVRE, and Bernhard MASCHKE. Port-hamiltonian formulation for systems of conservation laws: application to plasma dynamics in tokamak reactors. *IFAC Proceedings Volumes*, 45(19):108–113, 2012.
- [363] Peter Walters. A dynamical proof of the multiplicative ergodic theorem. *Transactions of the American Mathematical Society*, 335(1):245, jan 1993.
- [364] Jian Wang and Yong Wang. Noncommutative residue and sub-dirac operators for foliations. *Journal of Mathematical Physics*, 54(1):012501, jan 2013.
- [365] Jun Wang, Huyen Do, Adam Woznica, and Alexandros Kalousis. Metric learning with multiple kernels. In *NIPS*, pages 1170–1178, 2011.
- [366] Jun Wang, Alexandros Kalousis, and Adam Woznica. Parametric local metric learning for nearest neighbor classification. In *NIPS*, pages 1610–1618, 2012.
- [367] Jun Wang, Ke Sun, Fei Sha, Stéphane Marchand-Maillet, and Alexandros Kalousis. Two-stage metric learning. *CoRR*, abs/1405.2798, 2014.
- [368] Li Wang, Bernhard Maschke, and Arjan van der Schaft. Irreversible port-hamiltonian approach to modeling and analyzing of non-isothermal chemical reaction networks. *IFAC-PapersOnLine*, 49(26):134–139, 2016.
- [369] Li Wang, Bernhard Maschke, and Arjan van der Schaft. Port-hamiltonian modeling of non-isothermal chemical reaction networks. *Journal of Mathematical Chemistry*, 56(6):1707–1727, feb 2018.
- [370] Yuzhen Wang, Daizhan Cheng, and Xiaoming Hu. Problems on time-varying port-controlled hamiltonian systems: geometric structure and dissipative realization. *Automatica*, 41(4):717–723, 2005.
- [371] W.H. Warner, P.R. Sethna, and J.P. Sethna. A generalization of the theory of normal forms. *Journal of Nonlinear Science*, 6(6):499, 1996.
- [372] Geoffrey Washburn and Stephanie Weirich. Boxes go bananas: Encoding higher-order abstract syntax with parametric polymorphism. *J. Funct. Program.*, 18(1):87–140, 2008.
- [373] Joshua J. Waterfall, Fergal P. Casey, Ryan N. Gutenkunst, Kevin S. Brown, Christopher R. Myers, Piet W. Brouwer, Veit Elser, and James P. Sethna. Sloppy-model universality class and the vandermonde matrix. *Physical Review Letters*, 97(15), oct 2006.
- [374] Tamsyn P. Waterhouse. An introduction to chameleon gravity. 2006.

- [375] J.F. Watters. Simultaneous quasi-diagonalization of normal matrices. *Linear Algebra and its Applications*, 9:103–117, 1974.
- [376] Mingjian Wen, Junhao Li, Peter Brommer, Ryan S Elliott, James P Sethna, and Ellad B Tadmor. A KIM-compliantpotfitfor fitting sloppy interatomic potentials: application to the EDIP model for silicon. *Modelling and Simulation in Materials Science and Engineering*, 25(1):014001, nov 2016.
- [377] K. Willcox, O. Ghattas, B. van Bloemen Waanders, and B. Bader. An optimization frame work for goal-oriented, model-based reduction of large-scale systems. In *Proceedings of the 44th IEEE Conference on Decision and Control*. IEEE.
- [378] Matthew O. Williams, Ioannis G. Kevrekidis, and Clarence W. Rowley. A data-driven approximation of the koopman operator: Extending dynamic mode decomposition. *Journal of Nonlinear Science*, 25(6):1307–1346, jun 2015.
- [379] Alan S Willsky. Multiresolution, geometric, and learning methods in statistical image processing, object recognition, and sensor fusion. Technical report, MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INFORMATION AND DECISION SYSTEMS, 2004.
- [380] David P. Wipf. Sparse estimation with structured dictionaries. In *NIPS*, pages 2016–2024, 2011.
- [381] Yongxin Wu. Passivity preserving balanced reduction for the finite and infinite dimensional port hamiltonian systems. 2015.
- [382] Dong Xue. Distributed algorithm analysis and topology design in coevolutionary networks. 2018.
- [383] D. R. Yafaev. Quasi-diagonalization of hankel operators. *Journal dAnalyse Mathématique*, 133(1):133–182, oct 2017.
- [384] Dmitri Yerchuck, Alla Dovlatova, Felix Borovik, Yauhen Yerschak, and Vyacheslav Stelmakh. To principles of quantum mechanics development. *arXiv preprint arXiv:1407.2603*, 2014.
- [385] Xiyu Yu, Tongliang Liu, Xinchao Wang, and Dacheng Tao. On compressing deep models by low rank and sparse decomposition. In *CVPR*, pages 67–76. IEEE Computer Society, 2017.
- [386] Yuanlong Yu, Zhenzhen Sun, Wenxing Zhu, and Jason Gu. A homotopy iterative hard thresholding algorithm with extreme learning machine for scene recognition. *IEEE Access*, 6:30424–30436, 2018.
- [387] Paolo Zanardi, Lorenzo Campos Venuti, and Paolo Giorda. Bures metric over thermal state manifolds and quantum criticality. *Physical Review A*, 76(6), dec 2007.
- [388] Yichuan Zhang, José Miguel Hernández-Lobato, and Zoubin Ghahramani. Ergodic measure preserving flows. 2018.
- [389] Joey Tianyi Zhou, Ivor Wai-Hung Tsang, Sinno Jialin Pan, Zheng Qin, and Rick Siow Mong Goh. An end-to-end sparse coding. 2017.
- [390] Paola Zizzi. Theoretical setting of inner reversible quantum measurements. *CoRR*, abs/quant-ph/0507155, 2005.
- [391] Hans Zwart and Birgit Jacob. Distributed-parameter port-hamiltonian systems. *CIMPA*, 2009.