

土谷 隆 論文等リスト (2022年11月現在)

1. 査読付き原著論文

- [1] Takashi Tsuchiya, Bruno F. Lourenço, Masakazu Muramatsu and Takayuki Okuno: A limiting analysis on regularization of singular SDP and its implication to infeasible interior-point algorithms. *Mathematical Programming*, published online, doi.org/10.1007/s10107-022-01891-8, November 2022.
- [2] 土谷隆：新型コロナウイルス感染症の広がりに関する一考察. オペレーションズ・リサーチ, Vol.66 (2021), pp.90-103.
- [3] Bruno F. Lourenço, Masakazu Muramatsu and Takashi Tsuchiya: Solving SDP completely with an interior-point oracle. *Optimization Methods and Software*, Vol.36 (2021), pp.425–471, doi.org/10.1080/10556788.2020.1850720.
- [4] 土谷隆：統計数理研究所における最適化研究. 統計数理, Vol.67 (2019), pp.255–276.
- [5] Bruno F. Lourenço, Tomonari Kitahara, Masakazu Muramatsu and Takashi Tsuchiya: An extension of Chubanov’s algorithm to symmetric cones. *Mathematical Programming*, Vol. 173 (2019), pp117–149, doi.org/10.1007/s10107-017-1207-7.
- [6] Y.Cui, K.Morikuni, T.Tsuchiya and K. Hayami:Implementation of interior-point methods for LP based on Krylov subspace iterative solvers with inner-iteration preconditioning. *Computational Optimization and Applications*, Vol.74 (2019), pp.143-176.
- [7] Bruno F. Lourenço, Masakazu Muramatsu and Takashi Tsuchiya: Facial reduction and partial polyhedrality. *SIAM Journal on Optimization*, Vol. 28(2018), pp.2304-2326.
- [8] Tomonari Kitahara and Takashi Tsuchiya: An extension of Chubanov’s polynomial-time linear programming algorithm to second-order cone programming. *Optimization Methods and Software*, Vol.33 (2018), pp.1-25.
- [9] Leonid Faybusovich and Takashi Tsuchiya: Matrix monotonicity and self-concordance: how to handle quantum entropy in optimization problems. *Optimization Letters* (2017), pp.1-17. published online, <https://doi.org/10.1007/s1159>.
- [10] 荒川俊也, 土谷 隆：最大電力供給の統計的解析と節電について —東日本大震災がもたらした構造変化—. オペレーションズ・リサーチ, Vol. 65 (2016), pp. 698-710. (訂正: 同 p.882.)
- [11] Bruno F. Lourenço, Masakazu Muramatsu and Takashi Tsuchiya: Weak infeasibility in second order cone programming. *Optimization Letters*, Vol.10 (2016), pp. 1743-1755.

- [12] Bruno F. Lourenço, Masakazu Muramatsu and Takashi Tsuchiya: A Structural geometrical analysis of weakly infeasible SDPs. *Journal of Operations Research Society of Japan*, Vol. 59 (2016), No. 3, pp. 241-257.
- [13] Sumie Ueda, Kumi Makino, Yoshiaki Itoh, Takashi Tsuchiya: Logistic growth for the Nuzi cuneiform tablets: Analyzing family networks in ancient Mesopotamia. *Physica A*, Vol.421 (2015), pp. 223-232.
- [14] Satoshi Kakihara, Atsumi Ohara and Takashi Tsuchiya: Curvature integrals and iteration complexities in SDP and symmetric cone programs. *Computational Optimization and Applications*, Vol. 57 (2014), pp. 623-665.
- [15] Toshiya Arakawa, Akira Tanave, Shiho Ikeuchi, Aki Takahashi, Satoshi Kakihara, Shingo Kimura, Hiroki Sugimoto, Nobuhiko Asada, Toshihiko Shiroishi, Kazuya Tomihara, Takashi Tsuchiya, Tsuyoshi Koide: A male-specific QTL for social interaction behavior in mice mapped with automated pattern detection by a hidden Markov model incorporated into newly developed freeware, *Journal of Neuroscience Methods*, Vol. 234 (2014), pp. 127-134.
- [16] 土谷隆: 内点法・情報幾何・最適化モデリング. *統計数理*, Vol.61 (2013), pp.3-16.
- [17] Tomonari Kitahara and Takashi Tsuchiya: A simple variant of the Mizuno–Todd–Ye predictor-corrector algorithm and its objective-function-free complexity. *SIAM Journal on Optimization*, Vol. 23(2013), pp. 1890-1903.
- [18] Satoshi Kakihara, Atsumi Ohara and Takashi Tsuchiya: Information geometry and interior-point algorithms in semidefinite programs and symmetric cone programs. *Journal of Optimization Theory and Applications*, Vol.157 (2013), pp. 749-780.
- [19] T. Kitahara and T. Tsuchiya: Proximity of weighted and layered least squares solutions. *SIAM Journal of Matrix Analysis and Applications*, Vol. 31 (2009), pp. 1172-1186.
- [20] G. Ueno and T. Tsuchiya: Covariance regularization in inverse space. *Quarterly Journal of the Royal Meteorological Society*, Vol. 135 (2009), pp. 1133-1156.
- [21] Leonid Faybusovich, T. Mouktonglang and Takashi Tsuchiya: Numerical experiments with universal barrier functions. *Computational Optimization and Applications*, Vol. 41 (2008), pp. 205-223. 1156.
- [22] R.D.C. Monteiro and T. Tsuchiya: A strong bound on the integral of the central path curvature and its relationship with the iteration complexity of primal-dual path-following LP algorithms. *Mathematical Programming*, Vol. 115, No.1 (2008), pp. 105-149.
- [23] Kazuyuki Nakamura and Takashi Tsuchiya: A recursive recomputation approach for smoothing in nonlinear state space modeling — An attempt for reducing space complexity —. *IEEE Transactions on Signal Processing*, Vol. 55 (2007), pp. 5167-5178.
- [24] T. Tsuchiya and Y.Xia: An extension of the standard polynomial-time primal-dual path-following algorithm to the weighted determinant maximization problem with semidefinite constraints. *Pacific Journal of Optimization*, Vol. 3 (2007), pp. 165-182.

- [25] T. Fushiki, S. Horiuchi and T. Tsuchiya: A maximum likelihood approach to density estimation with semidefinite programming *Neural Computation*, Vol. 18 (2006), pp. 2777-2812.
- [26] Leonid Faybusovich, T. Mouktonglang and Takashi Tsuchiya: Implementation of infinite dimensional interior point method for solving multi-criteria linear-quadratic control problem. *Optimization Methods and Software*, Vol. 21 (2006), pp. 315-341.
- [27] 土谷 隆, 笹川 卓: 2次錐計画問題による磁気シールドのロバスト最適化. *統計数理*, vol. 53 (2005), No. 2, pp.297-315.
- [28] 土谷 隆: 層別最小二乗法 一重み付き最小二乗法の極限一. *統計数理*, vol. 53 (2005), No. 2, pp.391-404.
- [29] R. D. C. Monteiro and T. Tsuchiya: A new iteration-complexity bound for the MTY predictor-corrector algorithm. *SIAM Journal on Optimization*, Vol.15 (2004), pp. 319-347.
- [30] R. D. C. Monteiro, J. W. O’Neal and T. Tsuchiya: Uniform boundedness of a preconditioned normal matrix used in interior point methods. *SIAM Journal on Optimization*, Vol.15 (2004), pp. 96-100.
- [31] Leonid Faybusovich and Takashi Tsuchiya: Primal-dual algorithms and infinite-dimensional Jordan Algebras of finite rank. *Mathematical Programming*, Vol.97 (2003), No.3, pp.471-493.
- [32] R.D.C. Monteiro and T. Tsuchiya: A variant of the Vavasis-Ye layered-step interior-point algorithm for linear programming. *SIAM Journal on Optimization*, Vol.13 (2003), No.4, pp.1054-1079.
- [33] T. Sasakawa and T. Tsuchiya: Optimal magnetic shield design with second-order cone programming. *SIAM Journal on Scientific Computing*, Vol.24 (2003), No.6, pp. 1930-1950.
- [34] G. Ueno, N. Nakamura, T. Higuchi, T. Tsuchiya, S. Machida, T. Araki, Y. Saito, and T. Mukai: Application of multivariate Maxwellian mixture model to plasma velocity distribution function. *Journal of Geophysical Research*, Vol. 106, No. A11 (2001), pp. 25655–25672.
- [35] R. D. C. Monteiro and Takashi Tsuchiya: Polynomial convergence of primal-dual algorithms for the second-order cone program based on the MZ-family of directions. *Mathematical Programming*, Vol. 88 (2000), pp. 61–83.
- [36] T. Tsuchiya: A convergence analysis of the scaling-invariant primal-dual path-following algorithms for second-order cone programming. *Optimization Methods and Software*, Vol. 11 and 12 (1999), pp. 141-182.
- [37] T. Terlaky and T. Tsuchiya: A note on Mascarenhas’ counter example about global convergence of the affine scaling algorithm. *Applied Mathematics and Optimization*, Vol. 40 (1999), pp. 287-314.
- [38] R. D. C. Monteiro and T. Tsuchiya: Polynomial convergence of a new family of primal-dual algorithms for semidefinite programming. *SIAM Journal on Optimization*, Vol. 9 (1999), pp. 551-577.

- [39] R. D. C. Monteiro and T. Tsuchiya: Polynomiality of primal-dual algorithms for semidefinite linear complementarity problem based on the Kojima-Shindoh-Hara family of directions. *Mathematical Programming*, Vol. 84 (1999), pp. 39-53.
- [40] 土谷 隆: 半正定値計画問題に対する主双対内点法の自己双対な探索方向族について. *統計数理*, Vol. 46, No. 2 (1998), pp. 283-296.
- [41] N. Megiddo, S. Mizuno and T. Tsuchiya: A modified layered-step interior-point algorithm for linear programming. *Mathematical Programming*, Vol. 82 (1998), pp. 339-355.
- [42] R. D. C. Monteiro and Takashi Tsuchiya: Global convergence of the affine scaling algorithm for convex quadratic programming. *SIAM Journal on Optimization*, Vol. 8 (1998), pp. 26-58.
- [43] S. Mizuno, N. Megiddo and T. Tsuchiya: A linear programming instance with many crossover events. *Journal of Complexity*, Vol. 12 (1996), pp. 474-479.
- [44] R. D. C. Monteiro and T. Tsuchiya: Limiting behavior of the derivatives of certain trajectories associated with a monotone horizontal linear complementarity problem. *Mathematics of Operations Research*, Vol. 21 (1996), pp. 793-814.
- [45] T. Tsuchiya and R. D. C. Monteiro: Superlinear convergence of the affine scaling algorithm. *Mathematical Programming*, Vol. 75 (1996), pp. 77-110.
- [46] Takashi Tsuchiya: Affine scaling algorithm. In *Interior Point Methods of Mathematical Programming* (ed. T. Terlaky), pp. 35-82, Kluwer Academic Publisher, 1996.
- [47] A. El-Bakry, R. A. Tapia, T. Tsuchiya and Y. Zhang: On the formulation and theory of the Newton interior-point method for nonlinear programming. *Journal of Optimization Theory and Applications*, Vol. 89 (1996), pp. 507-541.
- [48] M. Muramatsu and T. Tsuchiya: Convergence analysis of the projective scaling algorithm based on a long-step homogeneous affine scaling algorithm. *Mathematical Programming*, Vol. 72 (1996), pp 291-305.
- [49] M. Muramatsu and T. Tsuchiya: An affine scaling method with an infeasible starting point: convergence analysis under nondegeneracy Assumption. *Annals of Operations Research*, Vol. 62 (1996), pp. 325-355.
- [50] Takashi Tsuchiya and Masakazu Muramatsu: Global convergence of a long-step affine scaling algorithm for degenerate linear programming problems. *SIAM Journal on Optimization*, Vol. 5, (1995), No. 3, pp. 525-551.
- [51] Takashi Tsuchiya: Quadratic convergence of Iri-Imai algorithm for degenerate linear programming problems. *Journal of Optimization Theory and Applications*, Vol. 87, No. 3 (1995), pp. 703-726.
- [52] M. G. C. Resende, T. Tsuchiya and G. Veiga: Identifying the optimal face of a network linear program with a globally convergent interior point method. In *Large Scale Optimization: State of the Art* (eds. W. W. Hager, D. W. Hearn and P. M. Pardalos, Kluwer Academic Publishes B. V., the Netherlands.) (1994), pp. 371-396.

- [53] 土谷隆：アフィンスケーリング法の理論的解析. 統計数理, Vol. 42(1994), No. 2, pp. 277-296.
- [54] R. D. C. Monteiro, T. Tsuchiya and Y. Wang: A simplified global convergence proof of the affine scaling algorithm. *Annals of Operations Research*, Vol. 47 (1993), pp. 443-482.
- [55] O. Güler, D. den Hertog, C. Roos, T. Terlaky and T. Tsuchiya: Degeneracy in interior point methods for linear programming: a survey. *Annals of Operations Research*, Vol. 46 (1993), pp. 107-138.
- [56] Takashi Tsuchiya: Global convergence of the affine scaling algorithms for the primal degenerate strictly convex quadratic programming problems. *Annals of Operations Research*, Vol. 47 (1993), pp. 509-539.
- [57] Takashi Tsuchiya: Global convergence property of the affine scaling methods for primal degenerate linear programming problems. *Mathematics of Operations Research*, Vol. 17, No. 3 (1992), pp. 527-557.
- [58] Takashi Tsuchiya: Global convergence of the affine scaling methods for degenerate linear programming problems. *Mathematical Programming Series B*, Vol. 52, No. 3 (1991), pp. 377-404.
- [59] Takashi Tsuchiya and Kunio Tanabe: Local convergence properties of new methods in linear programming. *Journal of the Operations Research Society of Japan*, Vol. 33, No. 1 (1990), pp. 22-45.
- [60] 土谷 隆, 伊理 正夫: 大規模非線形方程式系における丸め誤差の振る舞いについて. 統計数理, Vol. 36, No. 1 (1988), pp. 1-22.
- [61] M. Iri, T. Tsuchiya and M. Hoshi: Automatic computation of partial derivatives and rounding error estimates with applications to large-scale systems of nonlinear equations. *Journal of Computational and Applied Mathematics*, Vol. 24 (1988), pp. 365-392. (An extended English version of [1]).
- [62] 伊理 正夫, 土谷 隆, 星 守: 偏導関数計算と丸め誤差推定の自動化と大規模非線形方程式系への応用. 情報処理, Vol. 26, No. 11 (1985), pp. 1411-1420.

2. その他の解説記事, 総合報告等 (招待あるいは依頼によるもの)

- [1] 土谷隆：新型コロナウイルス感染症のダイナミクスとデータサイエンス. 数理科学, No.711(2022), pp. 44-50.
- [2] 土谷隆：簡単な数理モデルによる新型コロナウイルス感染症の流行の解析. 信頼性, Vol.42, No.2 (2022), pp. 62-71.
- [3] 土谷隆：新型コロナウイルス感染症の感染動態の簡単な数理モデルとワクチンの効果の解析. シミュレーション. Vol.40 (2021), No.4, pp.224-230.
- [4] 土谷隆：簡単な統計数理モデルによる新型コロナウイルス感染症流行の予測と社会的制御. 日本ソーシャルデータサイエンス学会論文誌. Vol.5 (2021), No.1, pp.7-12.
- [5] 小原敦美, 土谷隆: 正定値行列の情報幾何 (1)~(3). 岩波データサイエンス, No.2 (2016), pp.130-140, No.3 (2016), pp.137-149, No.4 (2016), pp.146-158.

- [6] 土谷 隆:最小二乗法を巡って. オペレーションズ・リサーチ, Vol. 59, No.1(2014),pp.34-41.
- [7] 土谷 隆, 小原 敦美:内点法と情報幾何:計算の複雑さへの微分幾何学的アプローチ. 数学セミナー, 2008年3月号.
- [8] 土谷 隆:層別最小二乗法と交差を用いた線形計画問題に対する内点法の解析と中心曲線の幾何学的性質. 第17回 RAMP シンポジウム予稿集, pp. 197-211, 2005年10月.
- [9] 土谷 隆:モデリング雑感. オペレーションズ・リサーチ, Vol. 50, No. 8 (2005), pp. 560-563.
- [10] 土谷 隆:最適化法. 計測と制御, Vol. 42, No. 2 (2003), pp. 251-257.
- [11] 土谷 隆:データ解析と内点法. 日本オペレーションズ・リサーチ学会第13回 RAMP シンポジウム予稿集, pp. 31-46, 2001年9月.
- [12] 土谷 隆:グラフィカルモデリングとその実例について. ESTRELA, No. 89, pp. 18-25, 2001年8月.
- [13] 土谷 隆:内点法と幾何学. 数理科学, No. 452 (2001), pp. 38-44.
- [14] 土谷 隆:最適化アルゴリズムの新展開:内点法とその周辺 (連載). システム/制御/情報, Vol. 43 (1998), pp. 218-226, 334-343, 460-469, 550-559, 677-686, Vol. 44 (1999), pp. 101-108, 209-217, 308-316.
- [15] 土谷 隆:凸最適化問題に対する内点法の発展. 数理科学, No. 405 (1996), pp. 40-47.
- [16] 土谷 隆:アフィンスケーリング法の理論的解析. 日本オペレーションズ・リサーチ学会第5回 RAMP シンポジウム予稿集, pp. 29-41,1993年10月.
- [17] 土谷 隆:退化した線形計画問題とアフィンスケーリング法. システム/制御/情報, Vol. 34 (1990), No. 4, pp. 216-222.
- [18] 田辺國士, 土谷 隆:線形計画の新しい幾何学. 数理科学, No. 303 (1988), pp. 32-37.

3. 著書

- [1] 張招良編:20世紀のトップ10アルゴリズム (第2章:線形計画法のアルゴリズムとその周辺), 共立出版, 2022年.
- [2] 寒野善博, 土谷隆:最適化と変分法, 丸善, 2014年.
- [3] 日本数学会(編):数学辞典(線形計画法, 半正定値計画法, 非線形計画法の項を執筆), 岩波書店, 2006年.
- [4] 藤原毅夫, 平松公彦, 久田俊明, 広瀬啓吉(編):応用数学ハンドブック(第7章:最適化(室田一雄と共著)), 丸善, 2005年.
- [5] 小島 政和, 土谷 隆, 水野 眞治, 矢部 博:内点法. 朝倉書店, 2001年9月.
- [6] 日本オペレーションズ・リサーチ学会編:OR 辞典(項目:非線形最適化等), 日科技連出版社, 2000年.

- [7] 情報処理学会編: 新版情報処理ハンドブック (第5章第1節: 数値解析の基礎), オーム社, 1995年.

4. 編著

- [1] Takashi Tsuchiya and Kokichi Sugihara (eds.): Special Issue Dedicated to the Memory of Professor Masao Iri. *Optimization Methods and Software*, Vol.36 (2021), No.2-3.
- [2] Fei Liu, Ryan Loxton and Takashi Tsuchiya (eds.): Special Section on the Pacific Optimization Conference, October 31 - November 2, 2014, Wuxi, China. *Optimization Methods and Software*, Vol.31(2016), No.6.
- [3] 山下浩 他: モデリングの諸相. 室田一雄, 池上敦子, 土谷隆 (編), 近代科学社, 2016年.
- [4] 赤池弘次 他: 応用数理の遊歩道. 日本応用数理学会 (編), 岩波書店, 2016年.
- [5] 赤池弘次 他: 情報量基準 AIC — モデリング・予測・知識発見 —. 室田一雄, 土谷隆 (編), 共立出版, 2007年.
- [6] 池上敦子, 土谷隆 (編): 特集 モデリング — さまざまな分野, さまざまな視点から —, Vol. 52 (2007), No. 4.
- [7] 土谷隆 (編): 特集 計算推論. 統計数理, vol. 53, No. 2 (2005).
- [8] H. Konno and T. Tsuchiya (eds.): New Trends in Optimization and Computational Algorithms (Special Issue). *Mathematical Programming*, Vol.97 (2003), No.3.
- [9] Kenji Fukumizu, Yukito Iba, Takashi Tsuchiya and Koji Tsuda (eds.): Special section on New trends in statistical information processing. *Annals of the Institute of Statistical Mathematics*, Vol. 55 (2003), No. 2.
- [10] Masao Fukushima and Takashi Tsuchiya (eds.): Special Issue dedicated to Professor Masao Iri on the Occasion of his 65th birthday. *Optimization Methods and Software*, Vol. 10, No. 2 (1999).

5. テクニカル・レポート

- [1] 土谷隆: 新型コロナウイルス感染症の広がりに関する一考察. GRIPS ディスカッション・ペーパー 20-4, 2020年5月.
- [2] Takashi Tsuchiya, Bruno F. Lourenco, Masakazu Muramatsu, Takayuki Okuno: A limiting analysis on regularization of singular SDP and its implication to infeasible interior-point algorithms. arXiv:1912.09696, December 2019. (The same manuscript is available from Optimization-online.)
- [3] Masakazu Muramatsu, Tomonari Kitahara, Bruno F. Lourenco, Takayuki Okuno, Takashi Tsuchiya: An oracle-based projection and rescaling algorithm for linear semi-infinite feasibility problems and its application to SDP and SOCP. arXiv:1809.10340, September 2018. (The same manuscript is available from Optimization-online.)
- [4] S. Kakihara, A. Ohara and T. Tsuchiya: Information geometry and primal-dual interior-point methods. *Research Memorandum* No. 1120, The Institute of Statistical Mathematics, Tokyo, November 2009.

- [5] A. Ohara and T. Tsuchiya: An information geometric approach to polynomial-time interior-point algorithms — Complexity bound via curvature integral—. *Research Memorandum* No. 1055, The Institute of Statistical Mathematics, Tokyo, December 2007.

3. 本や学術雑誌のエディタ

- [1] Fei Liu, Ryan Loxton and Takashi Tsuchiya (eds.) Special section on the Pacific Optimization Conference, October 31 - November 2, 2014, Wuxi, China. *Optimization Methods and Software*, Vol.31(2016), No.6.
- [2] Kenji Fukumizu, Yukito Iba, Takashi Tsuchiya and Koji Tsuda (eds.) : Special section on New trends in statistical information processing. *Annals of the Institute of Statistical Mathematics*, Vol. 55 (2003), No. 2.
- [3] H. Konno and T. Tsuchiya (eds.): New Trends in Optimization and Computational Algorithms(Special Issue). *Mathematical Programming*, Vol.97 (2003), No.3.
- [4] Masakazu Kojima, Takashi Tsuchiya, Shinji Mizuno, Hiroshi Yabe: Interior-point methods (in Japanese). Asakura-shoten, Tokyo, September 2001.
- [5] Masao Fukushima and Takashi Tsuchiya (eds.): Special Issue dedicated to Professor Masao Iri on the Occasion of his 65th birthday. *Optimization Methods and Software*, Vol. 10, No. 2 (1999).