(1) 履歴書

基本情報

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学歴

- 清華大学 (中国北京市, 5 年制), 理学学士 (応用数学系, 主専攻), 工学学士 (計算機科学と技術系, 副専攻)
- 京都大学工学研究科数理工学専攻修士課程, 工学修士
- 京都大学情報学研究科数理工学専攻博士課程, 博士 (情報学)

職歴

- 2002 年 4 月–2006 年 3 月, 宇都宮大学工学部情報工学科, 助教
- 2006 年 4 月–2014 年 3 月, 京都大学情報学研究科数理工学専攻, 講師
- 2013 年 4 月–2014 年 2 月, ドイツ・カールスルーエ工科大学, 客員教授
- 2014 年 4 月–2024 年 11 月, 京都大学大学院総合生存学館, 准教授
- 2018 年 4 月–現在, 同志社大学国際教育インスティテュート, 非常勤講師
- 2024 年 12 月–現在, 京都大学教育支援機構, 大学院総合生存学館, 教授

受賞

1. 奨学金: IBM Asia Fellowship, 文科省学習奨励費
2. Editor's Choice (論文賞), Liang Zhao, Hiroshi Nagamochi, Toshihide Ibaraki, "A primal-dual approximation algorithm for the survivable network design problem in hypergraphs," *Discrete Applied Mathematics*, 126(2-3), pp. 275–289 (2003). (IF: 1.0)
3. 一般講演優秀賞, 趙亮, "On an edge-dominating problem in networks," 情報処理学会第 6 回ネットワーク生態学シンポジウム, 2009 年 12 月 17–18 日, つくば産業技術総合研究所.
4. Best Paper Award, Liang Zhao, "Majority dominating and democratic number: A proposal to define the democracy of a social network," 4th Annual International Conference on Operations Research and Statistics (ORS 2016), Jan. 18–19, 2016, Singapore.
5. Best Paper Honorable Mention, Naoko Tosa, Pang Yunian, Liang Zhao, Ryohei Nakatsu,

"Genesis: New media art created as a visualization of fluid dynamics," 16th IFIC TC14 International Conference on Entertainment Computing (ICEC 2017), Sep. 18–21, 2017, Tsukuba, Japan

6. Best Paper Award, Wenruo Lyu, Liang Zhao, "A spatial connection aware complex network model for real-world social networks," 11th International Conference on Information Technology: IoT and Smart City (ICIT 2023), Dec. 14–17, 2023, Kyoto, Japan.

所属学会

- IEEE (Institute of Electrical and Electronics Engineers)
- ACM (Association for Computing Machinery)
- 日本オペレーションズ・リサーチ学会 (ORSJ)
- 電子情報通信学会 (IEICE)
- 映像情報メディア学会 (2002 年度 – 2005 年度)

(2) 教育業績表

(2.1) これまでの担当科目

これまで担当した科目を示す. 英語科目は, 下線で示されている.

- 2002 年 4 月 – 2006 年 3 月, 宇都宮大学工学部情報工学科：プログラミング演習 I (C 言語), プログラミング演習 III (Java), 情報工学実験 I, 情報処理システム製作, 卒業研究指導, 修士研究指導
- 2006 年 4 月 – 2014 年 3 月, 京都大学大学院情報学研究科 (工学部兼担)：数理工学実験, 数理工学セミナー, 論理システム, 数理科学英語, グラフ理論, 最適化, 計画数学通論 (大学院科目), 離散数理特論 (大学院科目), 卒業研究指導, 修士・博士研究指導
- 2014 年 4 月 – 現在, 京都大学大学院総合生存学館：Introduction to Operations Research, Optimization, Introduction to Human Survivability Studies, 知恵することー情報の視点から生命と社会の本質を考える (旧科目名：情報智慧特論), 避難所割当 (ILAS セミナー), スケールの科学 (ILAS セミナー), 熟議, サービスラーニング, 修士・博士研究指導
- 2018 年 4 月 – 現在, 同志社大学：Introduction to Information Systems

(2.2) 学生・若手研究者の指導

- 本学学生：博士 (主査) 3 名, 博士 (副査) 2 名, 博士 (ほか) 数名, 修士 (主指導) 約 20 名, 修士 (分野横断研究会で 2 回以上指導した他研究科学生, 主に AFLSP 関係) 約 80 名, 学部生約 10 名.
- 海外若手研究者：3 ヶ月以上の中長期訪問者 5 名 (中国 3, 海外在住日本人 1, オーストラリア 1), 短期訪問者 14 名 (アメリカ 1, インド 1, インドネシア 1, 台湾 1, 中国 10)

(2.3) リーダーシップ教育

- 2014 年 – 現在：京都大学思修館プログラム (グローバルリーダー育成), 実施委員
- 2015 年 – 2022 年：京都大学 ELP (次世代リーダーに向けた本質理解と世界観構築を目標としている社会人対象プログラム), 講師および運営委員
- 2016 年後期 – 現在：京都大学アジア未来リーダー奨学金プログラム (AFLSP), プログラム開発者と実施責任者, 主な担当者.

(2.4) 国際教育

- 留学生と外国人研究者に対してボランティアで留学に関する相談や講演を行っている.
- 2016 年後期 – 現在：主に AFLSP 関係の学生を対象に, 日本の理解や国際協力活動, SDGs の研究, フィールドワークによる地域貢献等の教育活動を主催している.
- 2022 年 – 現在：京大短期留学 Amgen プログラムの委員と受け入れ教員を務めている.

(3) 研究業績表

著書

1. 趙　亮, 生活の知恵から科学へ,「数理工学のすすめ (改訂 3 版)」, 京都大学工学部情報学科数理工学コース編集, 現代数学社, pp. 12–16 (2011).
2. 趙　亮, 情報学の視点に立って,「総合生存学」, 川井秀一, 藤田正勝, 池田裕一編, 京都大学学術出版会, pp. 111–127 (2015).
3. Liang Zhao, "Finding small dominating sets in large-scale networks," in *Big Data of Complex Networks*, M. Dehmer et al. eds., Chapman & Hall/CRC, pp. 121–146 (2016).
4. Liang Zhao, "From an informatics perspective," in *Human Survivability Studies*, S. Kawai et al. eds., Trans Pacific Pr, pp. 102–115 (2018).
5. 趙　亮, 情報乱雑さで生きることを考えてみる—機械は賢くなれるか,「実践する総合生存学」, 池田裕一編著, 京都大学学術出版会, pp. 405–440 (2021).
6. 趙　亮, 谷本　明子, 呂　文若, 最も好都合な議員定数,「選挙・投票・公共選択の数理」, 大山達雄編著, 共立出版, pp. 99–122 (2022).

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1. Liang Zhao, Hiroshi Nagamochi, Toshihide Ibaraki, "Approximating the minimum k-way cut in a graph via minimum 3-way cuts," *J. Combinatorial Optimization*, 5(4), pp. 397–410 (2001), `https://doi.org/10.1023/A:1011620607786`. (IF: 0.9)
2. Liang Zhao, Hiroshi Nagamochi, Toshihide Ibaraki, "A note on approximating the survivable network design problem in hypergraphs," *IEICE Transactions on Information and Systems*, E85-D(2), pp. 322–326 (2002-02). (IF: 0.59)
3. Liang Zhao, Hiroshi Nagamochi, Toshihide Ibaraki, "A primal-dual approximation algorithm

for the survivable network design problem in hypergraphs," *Discrete Applied Mathematics*, 126(2-3), pp. 275–289 (2003-03), `https://doi.org/10.1016/S0166-218X(02)00201-9`. (IF: 1.0)

4. <u>Liang Zhao</u>, Hiroshi Nagamochi, Toshihide Ibaraki, "A linear time 5/3-approximation for the minimum strongly-connected spanning subgraph problem," *Information Processing Letters*, 86(2), pp. 63–70 (2003-04), `https://doi.org/10.1016/S0020-0190(02)00476-3`. (IF: 0.7)

5. <u>Liang Zhao</u>, Hiroshi Nagamochi, Toshihide Ibaraki, "On generalized greedy splitting algorithms for multiway partition problems," *Discrete Applied Mathematics*, 143(1-3), pp. 130–143 (2004-09), `https://doi.org/10.1016/j.dam.2003.10.007`. (IF: 1.0)

6. <u>Liang Zhao</u>, Hideo Yamamoto, "A simple rendering system for web presentation," *Proc. Intl. Conf. Advanced Communication Technology 2004*, pp. 627–631 (2004), `https://doi.org/10.1109/ICACT.2004.1292945`.

7. <u>Liang Zhao</u>, Hideo Yamamoto. "On the bitmap-image based presenting," *Proc. IEEE Sixth International Symposium on Multimedia Software Engineering*, pp. 98–105 (2004), `https://doi.org/10.1109/MMSE.2004.55`.

8. <u>Liang Zhao</u>, Hiroshi Nagamochi, Toshihide Ibaraki, "Greedy splitting algorithms for approximating multiway partition problems," *Mathematical Programming*, 102(1), pp. 167–183 (2005), `https://doi.org/10.1007/s10107-004-0510-2`. (IF: 2.2)

9. <u>Liang Zhao</u>, Hideo Yamamoto, "Multisource receiver-driven layered multicast," *Proc. IEEE TENCON 2005*, pp. 1–4 (2005), `https://doi.org/10.1109/TENCON.2005.301296`.

10. Keizo Miyata, Shigeru Masuyama, Shin-ichi Nakayama, <u>Liang Zhao</u>, "NP-hardness proof and an approximation algorithm for the minimum vertex ranking spanning tree problem," *Discrete Applied Mathematics*, 154(16), pp. 2402–2410 (2006), `https://doi.org/10.1016/j.dam.2006.04.016`. (IF: 1.0)

11. <u>Liang Zhao</u>, Akira Shimae, Hiroshi Nagamochi, "Linear-tree rule structure for firewall optimization," *Proc. Communications, Internet, and Information Technology 2007*, pp. 67–72 (2007), `https://www.actapress.com/Content_Of_Proceeding.aspx?ProceedingID=446`.

12. Jiexun Wang, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "An efficient algorithm for generation colored outerplanar graphs," *Proc. Theory and Applications of Models of Computation 2007, Lecture Notes in Computer Science*, 4484, pp. 573–583 (2007), `https://doi.org/10.1007/978-3-540-72504-6_52`.

13. Hiroki Fujiwara, Jiexun Wang, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "Enumerating tree-like chemical graphs with given path frequency," *Journal of Chemical Information and Modeling*, 48(7), pp. 1345–1357 (2008), `https://doi.org/10.1021/ci700385a`. (IF: 5.6)

14. Masahiro Sasaki, <u>Liang Zhao</u>, Hiroshi Nagamochi. "Security-aware beacon based network monitoring," *Proc. 11th IEEE Singapore International Conference on Communication Sys-*

tems, pp. 527–531 (2008), `https://doi.org/10.1109/ICCS.2008.4737240`.

15. Yusuke Ishida, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "Improved algorithms for enumerating tree-like chemical graphs with given path frequency," *Genome Informatics*, 21, pp. 53–64 (2008), `https://doi.org/10.11234/gi1990.21.53`.

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17. Yusuke Ishida, Yuki Kato, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "Branch-and-bound algorithms for enumerating treelike chemical graphs with given path frequency using detachment-cut," *Journal of Chemical Information and Modeling*, 50(5), pp. 934–946 (2010), `https://doi.org/10.1021/ci900447z`. (IF: 5.6)

18. Tatsuya Ohshima, Pipaporn Eumthurapojn, <u>Liang Zhao</u>, Hiroshi Nagamochi, "An A$*$ algorithm framework for the point-to-point time-dependent shortest path problem," Revised Selected Papers of CGGA 2010, *Lecture Notes in Computer Science*, 7033, pp. 154–163 (2011), `https://doi.org/10.1007/978-3-642-24983-9_16`.

19. Lin Shan, Sonia Aissa, Hidekazu Murata, Susumu Yoshida, <u>Liang Zhao</u>, "An adaptive fairness and throughput control approach for resource scheduling in multiuser wireless networks," *IEICE Trans. on Communications*, E96-B(2), pp. 561–568 (2013), `https://doi.org/10.1587/transcom.e96.b.561`. (IF: 0.598)

20. <u>Liang Zhao</u>, Hiroshi Kadowaki, Dorothea Wagner, "A practical approach for finding small {independent, distance} dominating sets in large-scale graphs," *Proc. Algorithms and Architectures for Parallel Processing 2013, Lecture Notes in Computer Science*, 8286, pp. 157–164 (2013) `https://doi.org/10.1007/978-3-319-03889-6_18`.

21. <u>趙亮</u>, 新入生授業に課題解決型研究を取り入れて: 京都市広域避難場所割当マップの制作を通じた試み,「オペレーションズ・リサーチ = Communications of the Operations Research Society of Japan : 経営の科学」, 61(11), pp. 768–771 (2016), `https://cir.nii.ac.jp/crid/1520290884317327360`.

22. Naoko Tosa, Pang Yunian, <u>Liang Zhao</u>, Ryohei Nakatsu, "Genesis: New media art created as a visualization of fluid dynamics," *Proc. Entertainment Computing −ICEC 2017, Lecture Notes in Computer Science*, 10507, pp. 3–13 (2017), `https://doi.org/10.1007/978-3-319-66715-7_1`.

23. <u>Liang Zhao</u>, "$\gamma_k(n) = \max\{\lfloor n/(2k+1)\rfloor, 1\}$ for maximal outerplanar graphs with n mod $(2k+1) \leq 6$," *Journal of Information Processing*, 25, pp. 621–626 (2017), `https://doi.org/10.2197/ipsjjip.25.621`.

24. <u>Liang Zhao</u>, "A practical system for optimized assignment of shelters to evacuees," *Proc. 2017 IEEE Canada International Humanitarian Technology Conference*, pp. 42–45 (2017),

https://doi.org/10.1109/IHTC.2017.8058196.

25. Naoko Tosa, Ryohei Nakatsu, Pang Yunian, <u>Liang Zhao</u>, "Creation of media art utilizing fluid dynamics," *Proc. 2017 International Conference on Culture and Computing*, pp. 129–135 (2017), https://doi.org/10.1109/Culture.and.Computing.2017.30.

26. Yunian Pang, <u>Liang Zhao</u>, Ryohei Nakatsu, Naoko Tosa, "A study on variable control of sound vibration form (SVF) for media art creation," *Proc. 2017 International Conference on Culture and Computing*, pp. 136–142 (2017), https://doi.org/10.1109/Culture.and.Computing.2017.34.

27. Zhejun Liu, Deng Ke, Reika Sato, Tomoyuki Takami, <u>Liang Zhao</u>, "A privacy-aware exergame platform for multi-domain cognitive training," *Proc. 2018 Nicograph International*, pp. 58–61 (2018), https://doi.org/10.1109/NICOINT.2018.00019.

28. <u>Liang Zhao</u>, Wenlong Li, "Choose for no choose — Random-selecting option for the trolley problem in autonomous driving," *Proc. 9th International Conference on Logistics, Informatics and Service Sciences*, pp. 665–672 (2019), https://doi.org/10.1007/978-981-15-5682-1_48.

29. <u>Liang Zhao</u>, Tianyi Peng, "An allometric scaling for the number of representative nodes in social networks," *Proc. NetSci-X 2020: Sixth International Winter School and Conference on Network Science, Springer Proceedings in Complexity*, pp. 49–59 (2020), https://doi.org/10.1007/978-3-030-38965-9_4.

30. Yu Shi, Jianshen Zhu, Naveed Ahmed Azam, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "An inverse QSAR method based on a two-layered model and Integer Programming," *Int. J. Mol. Sci.* 22, 2847 (2021), https://doi.org/10.3390/ijms22062847. (IF: 4.9)

31. Jianshen Zhu, Naveed Ahmed Azam, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "An improved Integer Programming formulation for inferring chemical compounds with prescribed topological structures," *Proc. Advances and Trends in Artificial Intelligence. Artificial Intelligence Practices. IEA/AIE 2021. Lecture Notes in Computer Science*, 12798, pp. 197–209 (2021), https://doi.org/10.1007/978-3-030-79457-6_17.

32. Kouki Tanaka, Jianshen Zhu, Naveed Ahmed Azam, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "An inverse QSAR method based on decision tree and Integer Programming," *Proc. Intelligent Computing Theories and Application. ICIC 2021. Lecture Notes in Computer Science*, 12837, pp. 624–644 (2021), https://doi.org/10.1007/978-3-030-84529-2_53.

33. Naveed Ahmed Azam, Jianshen Zhu, Yanming Sun, Aleksandar Shurbevski, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "A novel method for inference of acyclic chemical compounds with bounded branch-height based on artificial neural networks and integer programming," *Algorithms Mol Biol* 16, 18 (2021), https://doi.org/10.1186/

s13015-021-00197-2. (IF: 1.5)

34. Wenlong Li, Jan-Dirk Schmoecker, Ali-gul Qureshi, <u>Liang Zhao</u>, "Historical transportation accessibility of Chinese Sui-Tang period and its socioeconomics influence," *Journal of the Eastern Asia Society for Transportation Studies*, 14, pp. 145–157 (2021), `https://doi.org/10.11175/easts.14.145`.

35. Naveed Ahmed Azam, Jianshen Zhu, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "Molecular design based on artificial neural networks, Integer Programming and grid neighbor search," *Proc. 2021 IEEE International Conference on Bioinformatics and Biomedicine*, pp. 360–363 (2021), `https://doi.org/10.1109/BIBM52615.2021.9669710`.

36. Hiroshi Nagamochi, Jianshen Zhu, Naveed Ahmed Azam, Kazuya Haraguchi, <u>Liang Zhao</u>, Tatsuya Akutsu, 機械学習 QSAR の整数計画法に基づく逆解析法, *Journal of Computer Chemistry*, 20(3), pp. 106–111 (2021), `https://doi.org/10.2477/jccj.2021-0030`.

37. Cong Xu, <u>Liang Zhao</u>, "Collective achievement, cohesive support, complementary expertise: 3Cs emergent model for shared leadership," *Human Resource Development International*, 26(2), pp. 175–200 (2022), `https://doi.org/10.1080/13678868.2022.2065442`. (IF: 3.8)

38. Jianshen Zhu, Naveed Ahmed Azam, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "An inverse QSAR method based on linear regression and Integer Programming," *Front. Biosci.* (Landmark Ed), 27 (6), 188 (2022), `https://doi.org/10.31083/j.fbl2706188`. (IF: 3.3)

39. Kai-hua Wang, Wen-yu Tai, Nuan Han, Guang-jie Zheng, Nan-xi Chen, Zhi-chao Chen, Dong-chun Liu, <u>Liang Zhao</u>, "A meta-analysis of astraglus prescription combined with conventional hypoglycemic agents in treatment of type 2 diabetes," *Central South Pharmacy*, 10, pp. 2413–2420 (2022), in Chinese, `https://caod.oriprobe.com/articles/64020124/huang_zuo_ji_qi_fu_fang_fu_zhu_chang_gui_jiang_tan.htm`.

40. Yunian Pang, Yanghepu Li, <u>Liang Zhao</u>, "Influence of cultural background on tourist flow process and outcomes: An empirical study with Chinese-speaking tourists in Japan," *Consumer Behavior in Tourism and Hospitality*, 17(4), pp. 530–543 (2022), `https://doi.org/10.1108/CBTH-09-2021-0206`. (IF: 5.5)

41. Pranshav Gajjar, Zhenyu Zuo, Yanghepu Li, <u>Liang Zhao</u>, "Enhancing graph convolutional networks with variational quantum circuits for drug activity prediction," *Proc. Third Congress on Intelligent Systems, Lecture Notes in Networks and Systems*, 613, pp. 789–800 (2022), `https://doi.org/10.1007/978-981-19-9379-4_57`.

42. Jianshen Zhu, Naveed Ahmed Azam, Fan Zhang, Aleksandar Shurbevski, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "A novel method for inferring chemical compounds with prescribed topological substructures based on Integer Programming," *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 19(6), pp. 3233–3245 (2022), `https://doi.org/10.1109/TCBB.2021.3112598`. (IF: 3.6)

43. Wenlong Li, Jan-Dirk Schmoecker, Ali-Gul Qureshi, <u>Liang Zhao</u>, "Reconstructing the transport network of ancient china and its relationship to social networks," *Proc. World Conference for Transport Research 2023*, accepted for publication.

44. Wenruo Lyu, <u>Liang Zhao</u>, "Axioms and divisor methods for a generalized apportionment problem with relative equality," *Mathematics*, 11, 3270 (2023), `https://doi.org/10.3390/math11153270`. (IF: 2.3)

45. Rimsa Goperma, Rojan Basnet, Pragati Gautam Adhikari, Sagun Narayan Joshi, <u>Liang Zhao</u>, "NETRA: Enhancing glaucoma diagnosis through deep learning — A comparative clinical validation study," *Proc. IEEE 11th Region 10 Humanitarian Technology Conference*, pp. 691–698 (2023), `https://doi.org/10.1109/R10-HTC57504.2023.10461926`.

46. Rojan Basnet, Rimsa Goperma, <u>Liang Zhao</u>, "Attentive cross-domain few-shot learning and domain adaptation in HSI classification," *Proc. 2023 IEEE Region 10 Conference TENCON*, pp. 220–225 (2023), `https://doi.org/10.1109/TENCON58879.2023.10322397`.

47. Wenruo Lyu, <u>Liang Zhao</u>, "Pyramid as a core structure in social networks," *Proc. Complex Networks & Their Applications XII. COMPLEX NETWORKS 2023. Studies in Computational Intelligence*, 1142, pp. 82–94 (2023), `https://doi.org/10.1007/978-3-031-53499-7_7`.

48. Wenruo Lyu, <u>Liang Zhao</u>, "A spatial connection aware complex network model for real-world social networks," *Proc. 11th International Conference on Information Technology: IoT and Smart City*, pp. 155–160 (2023), `https://doi.org/10.1145/3638985.3639011`.

49. Xiuyuan Hu, Yanghepu Li, Guoqing Liu, Yang Zhao, Hao Zhang, <u>Liang Zhao</u>, "De novo drug design against SARS-CoV-2 protein targets using SMILES-based deep reinforcement learning," *Proc. 11th International Conference on Information Technology: IoT and Smart City*, pp. 161–166 (2023), `https://doi.org/10.1145/3638985.3639012`.

50. Jianshen Zhu, Naveed Ahmed Azam, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "Molecular design based on Integer Programming and splitting data sets by hyperplanes," *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, (2024), `https://doi.org/10.1109/TCBB.2024.3402675`. (IF: 3.6)

51. Wenruo Lyu, <u>Liang Zhao</u>, "On a pyramid structure in social networks," *Social Network Analysis and Mining*, 14(1), pp. 82–94 (July 2024), `https://doi.org/10.1007/s13278-024-01286-x`. (IF: 2.3)

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on linear regression and Integer Programming," *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, accepted for publication (2024). (IF: 3.6)

その他の業績：国際会議論文概要 (査読付)

1. Kazuaki Katou, Liang Zhao, Shigeyuki Sakazawa, Hideo Yamamoto, "An adaptive content-aware scaling for receiver-driven layered video multicast," International Technical Conference on Circuits/Systems, Computers, and Communications (ITC-CSCC) 2003, Phoenix Park Hotel, Korea, pp. 904–905 (2003).

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18. <u>Liang Zhao</u>, Tetsuya Hashitani, Yukako Takeshita, Riku Hayami, Yukiko Ninomiya, Kengo Umegagi, Daichi Azuma, Ryota Miyamoto, Tomomi Itani, "Optimal assignment of wide-area evacuation centers for Kyoto City (abstract)," Fifth Annual International Conference on Operations Research and Statistic, pp. 171–174 (2017).

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20. Jianshen Zhu, Naveed Ahmed Azam, Shengjuan Cao, Ryota Ido, Kazuya Haraguchi, <u>Liang Zhao</u>, Hiroshi Nagamochi, Tatsuya Akutsu, "Molecular design based on Integer Programming and quadratic descriptors in a twolayered model," Intl. Conf. on Bioinformatics 2022 (InCoB2022), Nov. 21–23 (2022), online.

21. Wenlong Li, Jan-Dirk Schmocker, Ali-gul Qureshi, <u>Liang Zhao</u>, "Historical transportation deterrence and social tolerance for long-distance travel in ancient China revealed by the social networks ," 15th International Conference of the Eastern Asia Society for Transportation Studies (EASTS 2023), Sep. 4–7, Shan Alam, Malaysia (2023).

22. <u>Liang Zhao</u>, "Unsustainable data, Sustainable AI," special session "Can intelligence be sus-

tainable? A discussion on how and why cities transform through artificial intelligence and their associated technologies," 36th AESOP Congress, July 8–12, Paris, France (2024).

その他の業績：解説や講演

1. Linux IPsec HOWTO 日本語訳 `http://freescitech.net/1/ipsec_ja.txt`
2. OpenVPN Howto の日本語訳 `https://freescitech.net/2/ovpn2_howto_ja.html`
3. OpenVPN Ethernet Bridging の日本語訳 `https://freescitech.net/2/ovpn2_ether_ja.html`
4. OpenVPN Static Key Mini Howto の日本語訳 `https://freescitech.net/2/ovpn2_static_ja.html`
5. OpenVPN manual の日本語訳 (未完成) `https://freescitech.net/2/openvpn.8.gz`
6. OpenVPN の使用例 (オリジナルな解説) `https://freescitech.net/2/ovpn2_examples.html`
7. 最短路を計算する引っ張り法とダイクストラ法の解説ビデオ, `https://aw.gsais.kyoto-u.ac.jp/ja/liang/videos/rescue.mp4`
8. ほか, オープンソースソフトウェアの解説ブログを多数掲載.
9. Nonlinear Representation Theory, `https://aw.gsais.kyoto-u.ac.jp/research/nrt`.
10. 情報の観点から生命や知恵, AI, 国際関係, 未来人類社会などに関して, 京都大学 ELP (2015 年 – 2022 年連続) を初め, 企業の方や留学生向けに, 解説や講演を二十回以上 実施した.

その他の業績：製作・開発したシステム

1. 2003 年, findSCSS, 最小強連結部分グラフをみつける Java Applet (更新終了). あるイタリアの研究者の要望より C 言語版を作成して提供した. そのプログラムは, ロボットの制御に使われている (文献: `https://doi.org/10.1109/ACC.2012.6315292`).
2. 2004 年 – 2006 年, 宇都宮大学工学部情報工学科レポート提出システム (更新終了)
3. 2005 年, The official IPsec Howto for Linux (Revision 0.9.95) の和訳, `https://freescitech.net/1/ipsec_ja.txt` (更新終了). しばらく IPsec の日本語情報検索一位だった時期があった.
4. 2005 年, JWebPresenter, リモートでプレゼンテーションを行うシステム, Java Applet と Linux シェルプログラミングを使用. `https://zhao.sourceforge.net/` (開発終了). あるアメリカの大学の授業支援システムで使われた実績がある.
5. 2006 年 – 2017 年, OpenVPN 2.0 日本語情報 (HOWTO の和訳や Wiki など多数), `https://freescitech.net/2/` (更新終了). 数年間 OpenVPN 日本語情報検索の一位だった頃があり, 雑誌に紹介されたことがある.
6. 2006 年, The 9th Japan-Korea Joint Workshop on Algorithms and Computation (WAAC06) のウェブサイト構築, `https://www-or.amp.i.kyoto-u.ac.jp/waac06/`

7. 2007 年, ChimeMan, 学会タイマー, Java Applet (更新終了)

8. 2008 年 – 現在, phpUsher, イベント自動受付システム, PHP ウェブアプリケーション

9. 2008 年 – 現在, 情報処理学会アルゴリズム研究会 HP 作成支援システム (PHP や SQLite, Linux シェルなどを利用したもの), `http://www.ipsj-sigal.or.jp/` (10 年以上前から離れたが, HP のデザインをみていまでも使われているかと思われる.)

10. 2011 年頃 – (終了時期不詳), 情報学研究科ネットワーク脆弱性診断システム (Tenable Nessus + 独自に開発した分析・周知ツール), ウェブページ更新システム (PHP + シェルプログラミング)

11. 2015 年 – 現在, 総合生存学館ウェブサーバーの構築と維持 (ウェブページの内容は担当外), `https://www.gsais.kyoto-u.ac.jp`

12. 2015 年 – 現在, 総合生存学館未来智慧研究会のウェブサイト (含 Wiki) 構築と維持, `https://aw.gsais.kyoto-u.ac.jp`

13. 2016 年, 非公式京都市広域避難所割当マップ, `https://aw.gsais.kyoto-u.ac.jp/ja/liang/maps/kyoto.html`

14. 2007 年 4 月, 京都府立丹波養護学校 Wiki システムの構築 (2012 年 3 月に使用終了)

15. 2017 年, 非公式京都市広域避難所の動的割当システム, `https://aw.gsais.kyoto-u.ac.jp/ja/liang/maps/dynkyoto.html`

16. 2018 年 – 現在, 京都大学アジア未来リーダー奨学金プログラム (AFLSP) のウェブサイト (含 Wiki) 構築と維持, `https://www.aflsp.kyoto-u.ac.jp`

17. 2021 年 – 現在, AI による精神疾患の早期診断プロジェクト Niacin flushing segmentation benchmark project, `https://aw.gsais.kyoto-u.ac.jp/skin-flushing-segmentation/`.

18. 2021 年 – 現在, 化合物推定と生成プロジェクト Mol-infer のシステム開発 (分担者), `https://github.com/ku-dml/mol-infer`

19. 2023 – 現在, 非線形議会規模に関するデータ. Harvard Dataverse: Tanimoto, Akiko; Zhao, Liang, 2023, "Subnational Legislatures," `https://doi.org/10.7910/DVN/A3QGLL`.

20. 2023 – 現在, オープンアクセスな研究データやツールを多数提供している. Figshare: `https://figshare.com/authors/Liang_Zhao/14605394`.

21. 上記以外にも, 研究室のウェブサイトや Wiki サイトなどを多数構築したことがある.