Alan Kuhnle

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Biography

Alan Kuhnle is an Assistant Professor in the Department of Computer Science and Engineering at Texas A&M University, where he joined in Fall 2022. He received his Ph.D. in Computer Science from the University of Florida in 2018. His research focuses on the design and analysis of algorithms for combinatorial optimization, with applications to machine learning, social networks, and computational biology. At Texas A&M, Dr. Kuhnle has established a productive research program in submodular optimization, publishing in top venues including ICML, NeurIPS, KDD, AAAI, and JAIR. He has mentored two Ph.D. students and developed a new graduate course on Algorithmic Game Theory. His algorithms for submodular maximization achieve state-of-the-art theoretical guarantees while maintaining practical efficiency, enabling applications at scale. Dr. Kuhnle's work has been recognized with Best Paper awards at ASONAM 2018 and MSN 2014. He serves as Associate Editor for the Journal of Combinatorial Optimization and regularly serves on program committees for premier AI and machine learning conferences. His research is supported by awards from NOAA and internal Texas A&M grants.

Degrees

2018 Ph.D., Computer Science, University of Florida, Gainesville, FL, USA
2013 M.S., Computer Science, University of Florida, Gainesville, FL, USA
2010 B.S., Mathematics, Florida State University, Tallahassee, FL, USA

Texas A&M – Rank and Promotion History

Appointment: 60% Research / 30% Teaching / 10% Service

Effective Date	End Date	Faculty Title	Tenure Class.	Dept.	College
9/1/2022	Present	Assistant Professor	Tenure-Track	CSE	Engineering

Career Work Experience

2022 – Present Assistant Professor, Texas A&M University, Department of Computer Science and Engineering, College Station, TX, USA
2018 – 2022 Assistant Professor, Florida State University, Department of Computer Science, Tallahassee, FL, USA
2018 Postdoctoral Associate, University of Florida, Gainesville, FL, USA

Awards and Honors

Year	Award Title	Org.	Class.	Level	Description
2018	Best Runner-Up Paper Award	ASONAM 2018	Research	International	Paper: "Restraining Misinformation and Pushing out the Truth"
2014	Best Paper Award	MSN 2014	Research	International	Paper: "Online Algorithms for Optimal Resource Management in Dynamic D2D Communications"

Teaching

Texas A&M University

Course	Title	Cr	Lab	Mode	Lec	SCH	Enr	CoT	Sem.	Notes
CSCE 222H	Discrete Struct. (H)	3	0	F2F	3	69	23	100%	F22	UG honors
CSCE 221	Data Struct. & Alg.	4	2	F2F	3	96	24	100%	S24	UG
CSCE 221	Data Struct. & Alg.	4	2	F2F	3	108	27	100%	S25	UG
CSCE 221	Data Struct. & Alg.	4	2	F2F	3	244	61	100%	S26	UG; in progress
CSCE 631	Intelligent Agents	3	0	F2F	3	30	10	100%	F24	Grad
CSCE 631-600	Intelligent Agents	3	0	F2F	3	69	23	100%	F25	Grad; in-person
CSCE 631-700	Intelligent Agents	3	0	Online	3	33	11	100%	F25	Grad; online
CSCE 689	Alg. Game Theory	3	0	F2F	3	18	6	100%	F23	Grad; new course

Cr = Credit Hours; Lab = Lab Hours; Mode = Instruction Mode (F2F = Face-to-Face); Lec = Lecture Hours/wk; SCH = Student Credit Hours; Enr = Enrollment; CoT = % Contributed if co-taught. No multidisciplinary collaboration activities included.

Florida State University (2018–2022)

Course	Title	Cr	Lab	Mode	Lec	SCH	Enr	CoT	Sem.	Notes
CIS 4930/5930	Machine Learning	3	0	F2F	3	–	–	100%	F19	UG/Grad
COT 5405	Advanced Algorithms	3	0	F2F	3	–	–	100%	F20	Grad
CIS 4930/5930	Fund. of ML Algorithms	3	0	F2F	3	–	–	100%	S21	UG/Grad
COP 4521	Sec., Par., Dist. Prog. (Python)	3	0	F2F	3	–	–	100%	F21	UG
COT 5405	Advanced Algorithms	3	0	F2F	3	–	–	100%	S22	Grad

Graduate Advising

Chair

Fall 2022 – Ongoing **Yixin Chen**, Ph.D. Student, Computer Science and Engineering
[Started at FSU Fall 2020; continued at TAMU Fall 2022]

Fall 2023 – Ongoing **Ankur Nath**, Ph.D. Student, Computer Science and Engineering

Member (TAMU)

2024 – 2025	**Bokun Wang**, Ph.D. Student, Computer Science and Engineering [Proposal, Preliminary Exam, Dissertation, Final Exam (May 2025)]
2024 – 2025	**Hongyi Ling**, Ph.D. Student, Computer Science and Engineering [Proposal, Preliminary Exam, Dissertation, Final Exam (May 2025)]
2024	**Sambhav Khurana**, M.S. Student, Computer Science and Engineering [Proposal, Thesis Approval, Final Exam (Sept 2024)]
2024	**Shikhar Makhija**, M.S. Student, Electrical and Computer Engineering [Proposal, Thesis Approval, Final Exam (Oct 2024)]
2025 – Ongoing	**Brady Testa**, Ph.D. Student, Computer Science and Engineering [Proposal]
2025	**Joshua W. Goyder**, M.S. Student, Mathematics [Final Exam (Nov 2025)]

Chair (FSU)

2020 – 2022	**Yixin Chen**, Ph.D. Student, Computer Science, Florida State University [Continued at TAMU Fall 2022; listed above under Chair]
2020 – 2022	**Tonmoy Dey**, Ph.D. Student, Computer Science, Florida State University [Transitioned to another advisor after my departure]

Publications – Book Chapter

*Note: Student co-authors indicated with *.*

[1] Yixin Chen* and **Alan Kuhnle**. "Practical Submodular Maximization: A Primer." In: Pardalos, P.M., Du, D.-Z., and Thai, M.T. (eds.), *Handbook of Combinatorial Optimization*, pp. 1–41, Springer, New York, 2025. DOI: 10.1007/978-1-4614-6624-6_89-1.

Publications – Journal Articles

*Note: Student co-authors indicated with *.*

[1] Ankur Nath* and **Alan Kuhnle**. "A Benchmark for Maximum Cut: Towards Standardization of the Evaluation of Learned Heuristics for Combinatorial Optimization." *Transactions on Machine Learning Research*, 2025. (OpenReview, no volume/pages)

[2] Yixin Chen*, Tonmoy Dey*, and **Alan Kuhnle**. "Scalable Distributed Algorithms for Size-Constrained Submodular Maximization in the MapReduce and Adaptive Complexity Models." *Journal of Artificial Intelligence Research*, vol. 80, pp. 1575–1622, 2024.

[3] Yixin Chen* and **Alan Kuhnle**. "Practical and Parallelizable Algorithms for Non-Monotone Submodular Maximization with Size Constraint." *Journal of Artificial Intelligence Research*, vol. 79, pp. 599–637, 2024.

[4] Bahar Alipanahi, **Alan Kuhnle**, Simon J. Puglisi, Leena Salmela, and Christina Boucher. "Succinct Dynamic de Bruijn Graphs." *Bioinformatics*, vol. 37, no. 14, pp. 1946–1952, 2021.

[5] Tianyi Pan, Xiang Li, **Alan Kuhnle**, and My T. Thai. "Influence Diffusion in Online Social Networks with Propagation Rate Changes." *IEEE Transactions on Network Science and Engineering*, vol. 7, no. 4, pp. 3100–3111, 2020.

[6] Taher Mun, **Alan Kuhnle**, Christina Boucher, Travis Gagie, Ben Langmead, and Giovanni Manzini. "Matching Reads to Many Genomes with the r-Index." *Journal of Computational Biology*, vol. 27, no. 4, pp. 514–518, 2020.

[7] **Alan Kuhnle**, Taher Mun, Christina Boucher, Travis Gagie, Ben Langmead, and Giovanni Manzini. "Efficient Construction of a Complete Index for Pan-Genomics Read Alignment." *Journal of Computational Biology*, vol. 27, no. 4, pp. 500–513, 2020.

[8] Christina Boucher, Travis Gagie, **Alan Kuhnle**, Ben Langmead, Giovanni Manzini, and Taher Mun. "Prefix-free parsing for building big BWTs." *Algorithms for Molecular Biology*, vol. 14, Article 13, 2019.

[9] **Alan Kuhnle**, Victoria G. Crawford, and My T. Thai. "Scalable Approximations to k-Cycle Transversal Problems on Dynamic Networks." *Knowledge and Information Systems*, vol. 61, pp. 65–84, 2019.

[10] Victoria Crawford, **Alan Kuhnle**, Christina Boucher, Rayan Chikhi, and Travis Gagie. "Practical Dynamic de Bruijn Graphs." *Bioinformatics*, vol. 34, no. 24, pp. 4189–4195, 2018.

[11] **Alan Kuhnle**, Md A. Alim, Xiang Li, Huiling Zhang, and My T. Thai. "Multiplex Influence Maximization in Online Social Networks with Heterogeneous Diffusion Models." *IEEE Transactions on Computational Social Systems*, vol. 5, no. 2, pp. 418–429, 2018.

[12] **Alan Kuhnle**, Victoria G. Crawford, and My T. Thai. "Network Resilience and the Length-Bounded Multicut Problem: Reaching the Dynamic Billion-Scale with Guarantees." *Proc. ACM Meas. Anal. Comput. Syst. (SIGMETRICS)*, vol. 2, no. 1, Article 4, 26 pp., 2018.

[13] **Alan Kuhnle**, Xiang Li, J. David Smith, and My T. Thai. "Online set multicover algorithms for dynamic D2D communications." *Journal of Combinatorial Optimization*, vol. 34, no. 3, pp. 1237–1264, 2017.

[14] **Alan Kuhnle**, Nam P. Nguyen, Thang N. Dinh, and My T. Thai. "Vulnerability of clustering under node failure in complex networks." *Social Network Analysis and Mining*, vol. 7, Article 8, 2017.

[15] Subhankar Mishra, Xiang Li, Tianyi Pan, **Alan Kuhnle**, and My T. Thai. "Price Modification Attack and Protection Scheme in Smart Grid." *IEEE Transactions on Smart Grid*, vol. 8, no. 4, pp. 1864–1875, July 2017.

Publications – Refereed Conference Proceedings

*Note: Student co-authors indicated with *. Acceptance rates shown where available.*

[1] Yixin Chen*, Wenjing Chen, and **Alan Kuhnle**. "Breaking Barriers: Combinatorial Algorithms for Non-monotone Submodular Maximization with Sublinear Adaptivity and 1/e Approximation." *International Conference on Machine Learning (ICML)*, 2025. [≤30% acceptance]

[2] Ankur Nath* and **Alan Kuhnle**. "Theoretically Grounded Pruning of Large Ground Sets for Constrained, Discrete Optimization." *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2025. [≤30% acceptance]

[3] Ankur Nath* and **Alan Kuhnle**. "Hierarchical DeepPruner: A Novel Framework for Search Space Reduction." *International Symposium on Combinatorial Search (SOCS)*, 2025. [30–60% acceptance]

[4] Yixin Chen*, Ankur Nath*, Chunli Peng, and **Alan Kuhnle**. "Discretely Beyond 1/e: Guided Combinatorial Algorithms for Submodular Maximization." *Advances in Neural Information Processing Systems (NeurIPS)*, 2024. [≤26% acceptance]

[5] Yixin Chen* and **Alan Kuhnle**. "Approximation Algorithms for Size-Constrained Non-Monotone Submodular Maximization in Deterministic Linear Time." *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2023. [≤30% acceptance]

[6] Tonmoy Dey*, Yixin Chen*, and **Alan Kuhnle**. "DASH: A Distributed and Parallelizable Algorithm for Size-Constrained Submodular Maximization." *AAAI Conference on Artificial Intelligence (AAAI)*, 2023. [≤30% acceptance]

[7] Yixin Chen*, Tonmoy Dey*, and **Alan Kuhnle**. "Best of Both Worlds: Practical and Theoretically Optimal Submodular Maximization in Parallel." *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

[8] **Alan Kuhnle**. "Quick Streaming Algorithms for Maximization of Monotone Submodular Functions in Linear Time." *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2021. [Selected for Oral Presentation]

[9] **Alan Kuhnle**. "Nearly Linear-Time, Parallelizable Algorithms for Non-Monotone Submodular Maximization." *AAAI Conference on Artificial Intelligence (AAAI)*, 2021.

[10] **Alan Kuhnle**. "Interlaced Greedy Algorithm for Maximization of Submodular Functions in Nearly Linear Time." *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.

[11] Victoria G. Crawford, **Alan Kuhnle**, and My T. Thai. "Submodular Cost Submodular Cover with an Approximate Oracle." *International Conference on Machine Learning (ICML)*, 2019.

[12] **Alan Kuhnle**, Taher Mun, Christina Boucher, Travis Gagie, Ben Langmead, and Giovanni Manzini. "Efficient Construction of a Complete Index for Pan-Genomics Read Alignment." *International Conference on Research in Computational Molecular Biology (RECOMB)*, 2019.

[13] Huiling Zhang, **Alan Kuhnle**, J. David Smith, and My T. Thai. "Restraining Misinformation and Pushing out the Truth." *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2018. [**Best Runner-Up Paper Award**]

[14] Bahar Alipanahi, **Alan Kuhnle**, and Christina Boucher. "Recoloring the Colored de Bruijn Graph." *Symposium on String Processing and Information Retrieval (SPIRE)*, 2018.

[15] Christina Boucher, Travis Gagie, **Alan Kuhnle**, and Giovanni Manzini. "Prefix-Free Parsing for Building Big BWTs." *Workshop on Algorithms in Bioinformatics (WABI)*, 2018.

[16] **Alan Kuhnle**, J. David Smith, Victoria G. Crawford, and My T. Thai. "Fast Maximization of Non-Submodular, Monotonic Functions on the Integer Lattice." *International Conference on Machine Learning (ICML)*, 2018.

[17] Tianyi Pan, **Alan Kuhnle**, Xiang Li, and My T. Thai. "Vulnerability of Interdependent Networks with Heterogeneous Cascade Models and Timescales." *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2018.

[18] J. David Smith, **Alan Kuhnle**, and My T. Thai. "An Approximately Optimal Bot for Non-Submodular Social Reconnaissance." *ACM Conference on Hypertext and Social Media*, 2018.

[19] **Alan Kuhnle**, Victoria G. Crawford, and My T. Thai. "Scalable and Adaptive Algorithms for the Triangle Interdiction Problem on Billion-Scale Networks." *IEEE International Conference on Data Mining (ICDM)*, 2017. [Invited to KAIS Journal Special Issue]

[20] Tianyi Pan, **Alan Kuhnle**, Xiang Li, and My T. Thai. "Dynamic Propagation Rates: New Dimension to Viral Marketing in Online Social Networks." *IEEE International Conference on Data Mining (ICDM)*, 2017.

[21] **Alan Kuhnle**, Tianyi Pan, Victoria G. Crawford, Md A. Alim, and My T. Thai. "Pseudo-Separation for Assessment of Structural Vulnerability of a Network." *ACM SIGMETRICS / IFIP Performance*, 2017.

[22] **Alan Kuhnle**, Tianyi Pan, Md A. Alim, and My T. Thai. "Scalable Bicriteria Algorithms for the Threshold Activation Problem in Online Social Networks." *IEEE International Conference on Computer Communications (INFOCOM)*, 2017.

[23] Huiling Zhang, **Alan Kuhnle**, Huiyuan Zhang, and My T. Thai. "Detecting Misinformation in Online Social Networks Before It Is Too Late." *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2016.

[24] Huiyuan Zhang, Huiling Zhang, **Alan Kuhnle**, and My T. Thai. "Profit Maximization for Multiple Products in Online Social Networks." *IEEE International Conference on Computer Communications (INFOCOM)*, 2016.

[25] Subhankar Mishra, Xiang Li, **Alan Kuhnle**, My T. Thai, and Jungtaek Seo. "Rate Alteration Attacks in Smart Grid." *IEEE International Conference on Computer Communications (INFOCOM)*, 2015.

[26] **Alan Kuhnle**, Xiang Li, and My T. Thai. "Online Algorithms for Optimal Resource Management in Dynamic D2D Communications." *International Conference on Mobile Ad-hoc and Sensor Networks (MSN)*, 2014. [**Best Paper Award**]

[27] Md A. Alim, **Alan Kuhnle**, and My T. Thai. "Are communities as strong as we think?" *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2014.

Service

Editorial

2023 – Present	Associate Editor, *Journal of Combinatorial Optimization*

Workshop Organization

Jan 2026	Co-organizer, "Cooperation, Competition, and Complexity in AI Planning and Learning," special session at ISAIM 2026 (International Symposium on Artificial Intelligence and Mathematics), Fort Lauderdale, FL. (with Guni Sharon, Texas A&M)

Program Committee Member

2026	International Conference on Machine Learning (ICML 2026)
2026	AAAI Conference on Artificial Intelligence (AAAI-26)
2026	Symposium on Simplicity in Algorithms (SOSA 2026)
2024	International Conference on Learning Representations (ICLR 2024)
2023	International Conference on Machine Learning (ICML 2023)
2023	ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2023)

Referee / Reviewer

Mathematical Programming, 2025
Journal of Combinatorial Optimization
IEEE Transactions on Network Science and Engineering
IEEE/ACM Transactions on Networking
Various conference submissions (NeurIPS, ICML, AAAI, etc.)

External Examiner

2025	Ph.D. External Examiner, University of Melbourne

Department Service (Texas A&M)

2024 – Present	Member, MARC (Master's Admissions and Recruiting Committee)
Fall 2025	Member, PFTF (Peer-Faculty Teaching Feedback) Committee
2022-2023	Member, Graduate Admissions Committee

Professional Affiliations

- Association for Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE)

Presentations – Invited

[1] "Graduate Seminar." Department of Computer Science and Engineering, Texas A&M University, College Station, TX, April 2026. (Upcoming)

[2] "Department Seminar." Department of Computer and Information Sciences, University of Delaware, Newark, DE, May 2024.

[3] "Algorithms for Submodular Maximization." Institute for Informatics, Ludwig-Maximilians-Universität München, Munich, Germany, December 2019.

[4] "Scalable Algorithms for Network Resilience." Department of Computer Science, Texas A&M University, College Station, TX, October 2019.

[5] "Efficient Algorithms for Submodular Maximization." Department of Computer Science, Florida State University, Tallahassee, FL, February 2018.

[6] "Network Vulnerability and Resilience." Department of Computer Science, University of Central Florida, Orlando, FL, January 2018.

Grants and Contracts

Title	**Sponsor**	**Period**	**Total Award**	**$ to Kuhnle**	**Role**
Subaward: Recreational Fishing Data Collection	NOAA via LGL Ecological Research	Jan 2026 – Dec 2027	–	$160,251	Co-PI
TPT Collaborative Seed Grant	TAMU Internal	Apr 2025 – Mar 2026	$40,000	$16,000	Co-PI