Christopher Flathmann, PhD

Research Assistant Professor, Human-Centered Computing
Associate Director, Team Research Analytics in Computational Environments (TRACE) Research Group

School of Computing
College of Engineering, Computing, and Applied Sciences
Clemson University

Lab website: https://computing.clemson.edu/trace/
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Address: 119 McAdams Hall, Clemson, SC, 29631

Short Biography

Dr. Christopher Flathmann is a Research Assistant Professor and the Associate Director of the Team Research Analytics in Computational Environments (TRACE) Research Group within the division of Human-Centered Computing in the School of Computing at Clemson University. Dr. Flathmann received a PhD in Human-Centered Computing from Clemson University. For the last 5 years, Dr. Flathmann has prioritized the exploration of human-autonomy teamwork through multiple empirical research studies that have emphasized the importance of exploring the potential of human-autonomy teams that leverage modern autonomous platforms. As a mixed-methods research, Dr. Flathmann continuously leverages qualitative, quantitative, and computational methodologies iterate on various concepts within the human-centered AI domain, with a heavy emphasis on social influence, acceptance, and the human-centered design of AI teammates. Additionally, his work spans various contexts, including software development, education, sports, manufacturing, and command and control. To date, Dr. Flathmann has acquired over $3 million in research funding from Air Force Office of Scientific Research and the National Science Foundation. He has also been able to publish over 26 articles and papers in high-impact HCI and Human Factors venues, such as Computer Supported Cooperative Work, Computers in Human Behavior, Human-Computer Interaction, and GROUP, to name a few.

CURRICULUM VITAE

Christopher Flathmann

Research Assistant Professor, Human-Centered Computing
School of Computing, Clemson University
119 McAdams Hall, Clemson SC, 29631
Email: cflathm@clemson.edu

Education

Ph.D. Human-Centered Computing, Clemson University, 2023 (Advisor: Nathan J. McNeese)

B.S. Computer Science, Clemson University University, 2018

Appointments

Primary

2024- **Assistant Professor**, Human-Centered Computing, School of Computing, College of Engineering, Computing and Applied Sciences, Clemson University

2023-2024 **Research Assistant Professor**, Human-Centered Computing, School of Computing, College of Engineering, Computing and Applied Sciences, Clemson University

Secondary

2024- **Director**, Building Intelligent Goals for Collaboartive AI Technologies (BIG CAT) Research Group, Clemson University;

2024- **Co-Director**, Center for Human-AI Interation, Collaboration, and Teaming (CU-CHAI), Clemson University;

2023-2024 **Associate Director**, Team Research Analytics in Computational Environments (TRACE) Research Group, Clemson University; https://computing.clemson.edu/trace/

Achievement Highlights

- Over **25 publications** in top HCI and Human Factors conferences and journals.

- **Three best papers** received or nominated for Best Paper Award in ACM GROUP, ACM HAI, HICSS
- **Reviewer of over 12 journals and conferences**.
- **Over $3 million is awarded research funding**.

Sponsored Research Grants and Gifts

Funding Summary
Awarded (total across all grants/gifts): $3,479,441
Flathmann Allocation at Clemson: $934,382

External PI, Co-PI, & Senior Personnel(Active):

2024 Leveraging Adaptive Autonomous Teammates to Enable Resilience and Situational Awareness in Human-Autonomy Teams. ARL. (Co-PI, 45%) **$212,718**

2023 Minimizing the Impact of Cognitive and Physical Limitations from Humans and Autonomy Through the Development, Training, and Implementation of Human-Autonomy Teaming in Underwater Environments. ONR. (Co-PI, 30%) **$1,095,901**

2023 Collaborative Research: FW-HTF-RL: The Future of Aviation Inspection: Artificial Intelligence and Mixed Reality as Agents of Transformation. NSF. (Senior Personnel, 17%) **$1,558,433**

2023 Synchronizing Collaborations for Human-Autonomy Teaming and Ethical Autonomy Use. AFOSR DURIP. (Co-PI, 40%) **$612,389**

External Development & Writing Support of Funded Work:

2021 The Spread of Trust and Distrust in Distributed Human-Autonomy Teaming Constellations. AFOSR. **$1,302,657**

2021 Connecting and Leveraging Physical and Digital Dimensions to Advance Human-Autonomy Teaming. ONR DURIP. **$295,792**

2020 Promoting Human Interpretation and Interaction to Mitigate Bias in Artificial Intelligence Assisted Decision Aids. ONR. **$444,368**

2020 Considerations of Ethical and Unethical Behavior on Trust in Human-Autonomy Teaming. AFOSR. **$586,538**

Publications

Dissertation (Approved by Committee)

D.1 **Flathmann, C.** (February 2023). How to Make Agents and Influence Teammates: Understanding the Social Influence AI Teammates Have in Human-AI Teams. Committee: Nathan McNeese, Brian Dean, Eileen Kraemer, Brygg Ullmer, Laine Mears

Journal Articles

JA.22 Schelble, B. G., **Flathmann, C.**, Macdonald, J. P., Knijnenburg, B., Brady, C., & McNeese, N. J. (2024). Modeling perceived information needs in human-AI teams: improving AI teammate utility and driving team cognition. Behaviour & Information Technology, 1–24. https://doi.org/10.1080/0144929X.2024.2396476

JA.21 Mallick, R., **Flathmann, C.**, Duan, W., Schelble, B. G., & McNeese, N. J. (2024). What you say vs what you do: Utilizing positive emotional expressions to relay AI teammate intent within human-AI teams. *International Journal of Human-Computer Studies*, 103355. https://doi.org/10.1016/j.ijhcs.2024.103355

JA.20 Hauptman, A. I., Mallick, R., **Flathmann, C.**, & McNeese, N. J. (2024). Human factors considerations for the context-aware design of adaptive autonomous teammates. *Ergonomics*, 1-17. https://doi.org/10.1080/00140139.2024.2380341

JA.19 Hauptman, A. I., **Flathmann, C.**, & McNeese, N. J. (2024). Adapting to the human: A systematic review of a decade of human factors research on adaptive autonomy. *Applied Ergonomics*, 120, 104336. https://doi.org/10.1016/j.apergo.2024.104336

JA.18 Hauptman, A. I., Schelble, B. G., Duan, W., **Flathmann, C.**, & McNeese, N. J. (2024). Understanding the influence of AI autonomy on AI explainability levels in human-AI teams using a mixed methods approach. *Cognition, Technology & Work*, 1-21. https://doi.org/10.1007/s10111-024-00765-7

JA.17 **Flathmann, C.**, Duan, W., McNeese, N., Hauptman, A., & Zhang, R. (2024). Empirically Understanding the Potential Impacts and Process of Social Influence in Human-AI Teams. *Proceedings of the ACM on Human-Computer Interaction.* (CSCW). https://doi.org/10.1145/3637326

JA.16 Zhang, R., **Flathmann, C.**, Duan. W., Schelble, B.G., McNeese, N.J., & Knijnenberg, B. (2024). I Know This Looks Bad, But I Can Explain: Understanding When AI Should Explain Actions In Human-AI Teams. *ACM Transactions on Interactive Intelligent Systems*. http://dx.doi.org/10.1145/3635474

JA.15 O'Neill, T. A., **Flathmann, C.**, McNeese, N. J., Jones, S. K., & Schelble, B. (2024). A comment on "Can you Outsmart the Robot? An Unexpected Path to Work Meaningfulness" by Bernadeta Goštautaitė, Irina Liubertė, Sharon K. Parker, and Ilona Bučiūnienė: Calling for a different path for the future of human-robot teaming. *Academy of Management Discoveries.* https://doi.org/10.5465/amd.2024.0009

JA.14 Musick, G., Duan, W., Sengupta, S., **Flathmann, C.**, Knijnenburg, B., & McNeese, N.J., (2024). To share or not to share: Understanding and modeling individual disclosure preferences in recommender systems for the workplace. *ACM GROUP*. https://doi.org/10.1145/3633074

JA.13 Lancaster, C., Schulenberg, K., **Flathmann, C.**, McNeese, N.J., & Freeman, G., (2024). "It's Everybody's Role to Speak Up... But Not Everyone Will": Understanding AI Professionals' Perceptions of Accountability for AI Bias Mitigation. *ACM Responsible Computing*. https://doi.org/10.1145/3632121

JA.12 Musick, G., Hauptman, A. I., **Flathmann, C.**, McNeese, N. J., & Knijnenburg, B. P. (2023). Recommendations with Benefits: Exploring Explanations in Information Sharing Recommender Systems for Temporary Teams. *International Journal of Human-Computer Interaction* https://doi.org/10.1080/10447318.2023.2278933

JA.11 Mallick, R., **Flathmann, C.**, Lancaster, C., Hauptman, A., McNeese, N.J., & Freeman, G., (2023). The Power of Positive AI: Designing next-generation artificial intelligence to adapt to the emotional needs of Human Teammates within Human-Agent Teams *Behavior and Information Technology*. https://doi.org/10.1080/0144929X.2023.2277909

JA.10 **Flathmann, C.**, Schelble, B.G., McNeese, N.J., Knijnenberg, B., Gramopadhye, A., & Madathil K.C. (2023). The Purposeful Presentation of AI Teammates: Impacts on Human Acceptance and Perception. *International Journal of Human-Computer Interaction*. https://doi.org/10.1080/10447318.2023.2254984

JA.9 Mcneese, N.J., **Flathmann, C.**, O'Neill, T., & Salas, E., (2023). Stepping out of the shadow of human-human teaming: Crafting a unique identity for human-autonomy teams *Computers in Human Behavior*. https://doi.org/10.1016/j.chb.2023.107874

JA.8 O'Neill, T., **Flathmann, C.**, McNeese, N.J., & Salas, E., (2023). 21st Century teaming and beyond: Advances in human-autonomy teamwork *Computers in Human Behavior*. https://doi.org/10.1016/j.chb.2023.107865

JA.7 **Flathmann, C.**, Schelble, B. G., Rosopa, P. J., McNeese, N. J., Mallick, R., & Madathil, K. C. (2023). Examining the impact of varying levels of AI teammate influence on human-AI teams. *International Journal of Human-Computer Studies*, 177, 103061. https://doi.org/10.1016/j.ijhcs.2023.103061

JA.6 O'Neill, T., **Flathmann, C.**, McNeese, N.J., & Salas, E., (2023). Human-autonomy Teaming: Need for a guiding team-based framework? *Computers in Human Behavior*. https://doi.org/10.1016/j.chb.2023.107762

JA.5 Zhang, R., Wen, D., **Flathmann, C.**, Freeman, G., & McNeese, N.J. (2023). Investigating AI Teammate's Communication Strategies and Their Impact in Human-AI Teams For Effective Teamwork. *Proceedings of the ACM on Human-Computer Interaction.* (CSCW). https://doi.org/10.1145/3610072

JA.4 **Flathmann, C.**, McNeese, N.J., Schelble, B.G., Knijnenburg, B., & Freeman, G. (2023). Understanding the Impact and Design of AI Teammate Etiquette. *Human-Computer Interaction*. https://doi.org/10.1080/07370024.2023.2189595

JA.3 Schelble, B., **Flathmann, C.**, McNeese, N.J., O'Neill, T., Pak, R., & Namara, M. (2022). Investigating the Effects of Perceived Teammate Artificiality on Human Performance and Cognition. *International Journal of Human-Computer Interaction*. https://doi.org/10.1080/10447318.2022.2085191

JA.2 Schelble, B.G., **Flathmann, C.**, Musick, G., McNeese, N.J., & Freeman, G. (2022). I See You: Examining the Role of Spatial Information in Human-Agent Teams. *Proceedings of the ACM on Human-Computer Interaction.* (CSCW), 1-27. https://doi.org/10.1145/3555099

🏆 JA.1 Schelble, B.G., **Flathmann, C.**, McNeese, N.J., Freeman, G., & Mallick, R. (2022). Let's Think Together! Assessing Shared Mental Models, Performance, and Trust in Human-Agent Teams. *Proceedings of the ACM on Human-Computer Interaction. 6*(GROUP), 1-29. https://doi.org/10.1145/3492832
***Honorable Mention Paper Award**

Book Chapters:

B.2 **Flathmann, C.**, Schelble, B.G., & McNeese, N.J. (2023). Refocusing Human-AI Interaction Through a Teamwork Lens. Book Chapter in *Handbook on Virtual Work*. Edward Elgar Publishing. https://doi.org/10.4337/9781802200508.00013

B.1 Rapa, L. J., Marshall, J. C., Madison, S. M., **Flathmann, C.**, Knijnenburg, B. P., & McNeese, N. J. (2022). Clemson University's Teacher Learning Progression Program: Personalized Advanced Credentials for Teachers. In *Handbook of Research on Credential Innovations for Inclusive Pathways to Professions* (pp. 313-334). IGI Global. http://doi.org/10.4018/978-1-7998-3820-3.ch016

Conference Full Papers (Referred):

C.10 Guo, L., **Flathmann, C.**, Anaraky, R., McNeese, N., & Knijnenburg, B. (2022) The Effect of Recommendation Source and Justification on Professional Development Recommendations for High School Teachers. *HT'22: 33rd ACM Conference on Hypertext and Social Media*. https://doi.org/10.1145/3511095.3531280

C.9 **Flathmann, C.**, Schelble, B. G., & McNeese, N. J. (2021, September). Fostering Human-Agent Team Leadership by Leveraging Human Teaming Principles. *In 2021 IEEE 2nd International Conference on Human-Machine Systems* (ICHMS) (pp. 1-6). IEEE. https://doi.org/10.1109/ICHMS53169.2021.9582649

C.8 **Flathmann, C.**, Schelble, B. G., Zhang, R., & McNeese, N. J. (2021, July). Modeling and Guiding the Creation of Ethical Human-AI Teams. *In Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics*, and Society (pp. 469-479). https://doi.org/10.1145/3461702.3462573

🏆C.7 Schelble, B., **Flathmann, C.**, Canonico, L. B., & Mcneese, N. (2021, January). Understanding human-AI cooperation through game-theory and reinforcement learning models. *In Proceedings of the Annual Hawaii International Conference on System Sciences*. *Nominated for Best Paper* http://dx.doi.org/10.24251/HICSS.2021.041

🏆C.6 **Flathmann, C.**, Schelble, B., Tubre, B., McNeese, N., & Rodeghero, P. (2020, November). Invoking Principles of Groupware to Develop and Evaluate Present and Future Human-Agent Teams. *In Proceedings of the 8th International Conference on Human-Agent Interaction* (pp. 15-24). *Awarded Overall Best Paper* https://doi.org/10.1145/3406499.3415072

C.5 Schelble, B. G., **Flathmann, C.**, & McNeese, N. (2020, November). Towards meaningfully integrating human-autonomy teaming in applied settings. *In Proceedings of the 8th International Conference on Human-Agent* Interaction (pp. 149-156). https://doi.org/10.1145/3406499.3415077

C.4 Musick, G., Maloney, D., **Flathmann, C.**, McNeese, N. J., & Walton, J. (2020, December). Differentiated Instruction further Realized through Teacher-Agent Teaming. *In Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 64, No. 1, pp. 1318-1322). Sage CA: Los Angeles, CA: SAGE Publications. https://doi.org/10.1177%2F1071181320641315

C.3 **Flathmann, C.**, McNeese, N., & Canonico, L. B. (2019, November). Using human-agent teams to purposefully design multi-agent systems. *In Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 63, No. 1, pp. 1425-1429). Sage CA: Los Angeles, CA: SAGE Publications. https://doi.org/10.1177%2F1071181319631238

C.2 Canonico, L. B., **Flathmann, C.**, & McNeese, N. (2019, November). Collectively intelligent teams: Integrating team cognition, collective intelligence, and ai for future teaming. *In Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 63, No. 1, pp. 1466-1470). Sage CA: Los Angeles, CA: SAGE Publications. https://doi.org/10.1177%2F1071181319631278

C.1 Canonico, L. B., **Flathmann, C.**, & McNeese, N. (2019, November). The wisdom of the market: Using human factors to design prediction markets for collective intelligence. *In Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 63, No. 1, pp. 1471-1475). Sage CA: Los Angeles, CA: SAGE Publications. https://doi.org/10.1177%2F1071181319631282

Workshop Papers & Organization (Peer Reviewed):

WP.4 **Christopher Flathmann,**, and Nathan J. McNeese (2022). Understanding the Criticality of Human Adaptation when Designing Human-Centered AI Teammates *2022 NuerIPS workshop on Human-Centered Artificial Intelligence* Virtual, December 9, 2022.

WP.3 Beau G. Schelble, **Christopher Flathmann,**, Scalia, M., Zhou, S., Chris Myers, Nathan J. McNeese, Jamie Gorman, Guo Freeman (2022). Addressing the Spread of Trust and Distrust in Distributed Human-AI Teaming Constellations. Workshop on Trust and Reliance in AI-Human Teams (TRAIT). *2022 ACM Conference on Computer-Human Interaction (CHI'22).* New Orleans, LA. April 30th, 2022.

WP.2 Guo, L., Anaraky, R., **Flathmann, C.**, McNeese, N.J., Knijnenburg, B. (2021). How to Recommend Professional Development Pathways to High School Teachers. Workshop on Human-Machine Partnerships in the Future of Work: Exploring the Role of Emerging Technologies in Future Workplaces. *2021 ACM Conference on Computer Supported Cooperative Work (CSCW'21).* Virtual. Oct. 23rd, 2021.

WP.1 Schelble, B.G., **Flathmann, C.**, McNeese, N.J. (2021). Reducing Bias by Prioritizing Multi-Cultural Human-Agent Teams. Workshop on Human-Machine Partnerships in the Future of Work: Exploring the Role of Emerging Technologies in Future Workplaces. *2021 ACM Conference on Computer Supported Cooperative Work (CSCW'21).* Virtual. Oct. 23rd, 2021.

Research Posters:

P.2 **Flathmann, C.**, Schelble, B.G., & McNeese, N.J. (2020, September). Creating Human-Oriented Multi-Agent Teams. In *Insights @ BMW Manufacturing Co. LLC.* Greenville, SC.

P.1 **Flathmann, C.** and Nathan McNeese. 2020. Using Human-Agent Teams to Purposefully Design Multi-Agent Teams. *Clemson 2019 Research Symposium*, 12 April 2019

Presentations (Invited, Conference, & Program Reviews):

Pre.10 Introducing Clemson University's New AI Entrepreneur Competition on AI for Social Good. Clemson University. March 2024.

Pre.9 Understanding how Robotics will Evolve the Future of Teamwork. HCC 8500. Janurary 2024

PRE.8 Leveraging AI Technology as a Key Component of Future Manufacturing Strategies. AMFG 6800. October 2023.

PRE.6 Understanding the Impact of Trust and Ethics in Human-Autonomy Teaming. AFOSR Trust and Influence Annual Program Review Meeting. September 2022.

PRE.7 Reshaping Human Roles in Future Smart Manufacturing Environments. AMFG 6800. September 2022.

PRE.6 Connecting and Leveraging Physical and Digital Dimensions to Advance Human-Autonomy Teaming. ONR Science of Autonomy Annual Program Review Meeting. September 2022.

PRE.5 The role of AI in Future Manufacturing Environments. AMFG 6800. September 2021.

PRE.4 Fostering Human-Agent Team Leadership by Leveraging Human Teaming Principles. IEEE ICHMS. September 2021.

PRE.3 Contributing to the NRT Structure and Content. NRT Annual Meeting. January 2021.

PRE.2 Invoking Principles of Groupware to Develop and Evaluate Present and Future Human-Agent Teams. Human-Agent Interaction. October 2020.

PRE.1 Using Human-Agent Teams to Purposefully Design Multi-Agent Systems. Human Factors and Ergonomics Society Annual Meeting. November 2019.

Teaching

Student Advising

As a Research Assistant Professor at Clemson University

PhD Student Mentorship

2022-present Rohit Mallick- PhD, Human-Centered Computing (*multiple projects: 10 hours/week*)

Undergraduate Students

2021-present Jennifer Hsu BS, Computer Science
(*multiple projects: 10 hours/week*)

2021-present Christian Ihekweazu BS, Computer Science
(*multiple projects: 10 hours/week*)

2022-present Noah Taverez BS, Computer Science
(*multiple projects: 10 hours/week*)

2022-present Jake Macdonald BS, Computer Science
(*multiple projects: 10 hours/week*)

2021-2023 Alyssa Williams BS, Computer Science
(*multiple projects: 10 hours/week*)

As a PhD Student & Reserach Assistant at Clemson University

PhD Students

2020-2022 Geoffery Musick- PhD, Human-Centered Computing

Undergraduate Students

2018-2020 Casey Hird- BS, Computer Engineering (*multiple projects: 10 hours/week*)

2019-2022 Steve Russell- BS, Computer Science (*multiple projects: 10 hours/week*)

2020-2022 Wesley Everett- BS, Computer Science (*UPIC Intern*)

2020-2021 Top Lee- BS, Computer Science (*multiple projects: 10 hours/week*)

Teaching Experience

Clemson University

Courses Taught

Spring 2024 **Lead Instructor** CPSC 4440/6440: Cloud Computing Architecture
Spring 2024 Students' Instructor Evaluation: 4.51/5

Spring 2024 **Lead Instructor** CPSC 9500: School of Computing Seminar

Fall 2023 **Lead Instructor** CPSC 9500: School of Computing Seminar

2021-2023 **Recurring Guest Lecturer** HCC 8500: The Science of Teamwork and Technology

Fall 2021 **Recurring Guest Lecturer** CPSC 4140: Human and Computer Interaction

2020-2021 **Volunteer Graduate Teaching Assistant** AMFG 6200: Collaboration and Teamwork in Manufacturing Systems

2017 **Undergraduate Teaching Assistant** CPSC 2120: Algorithms and Data Structures

Professional Activities

Memberships

2020- **Member** Association for Computing Machinery (ACM)

2023- **Member** Human-Factors and Ergonomic Systems Society

Reviewing

Journals

2024- Applied Ergnonomics

2024- Behavior and Information Technology

2023- ACM Transactions on Interactive Intelligence Systems, *Distinguished Reviewer

2023- Applied Artificial Intelligence

2022- Journal of Field Robotics

2022- Computers in Human Behavior

2021- ACM Transactions on Human-Robot Interaction

2021- Journal of Cognitive Engineering and Decision Making

2020- Human Factors: The Journal of the Human Factors and Ergonomics Society

Conferences

2024- ACM Collective Intelligence

2021- ACM Computer-Human Interaction (CHI)

2021- ACM/IEEE Human-Robot Interaction (HRI)

2021- IEEE International Conference on Tools with Artificial Intelligence (ICTAI)

2020- ACM Computer Supported Cooperative Work (GROUP)

2020- Human Factors and Ergonomics Society Annual Meeting (HFES)

2020- Winter Simulations Conference (WSC)

2020- Military Health System Research Symposium (MHSRS)

Funding Agencies
2024- NASA Human Exploration Research Opportunities, panelist

Professional Community/National Service
2021 Presenter, National Research Traineeship, "Contributing to the NRT Structure and Content"

Society/International Service
2023 User Modeling, Adaptation, and Personalization (UMAP) Late-Breaking Work Program Committee Member

University Service

University Service/Representation
Clemson University

2023 United States Army CentCom Visitor Host

2023 United States Air Force Academy Visiting Cadet Host

2023 Robotics Demonstration Lead @ Clemson Elementary STEM Night

2019 Visiting German Computing Graduate Student Group Tour Guide

Honors & Awards

2023 ACM GROUP Honorable Mention Best Paper Award

2021 HICSS Best Paper Nomination

2020 Overall Best Paper Award for International Conference on Human-Agent Interaction (HAI)

2020 Top Papers of International Conference on Human-Agent Interaction (HAI)

2019 Clemson Three Minute Thesis Finalist for the College of Computing, Engineering, and Applied Science

2018 International Collegiate Programming Contest Regional Qualifier, Top Clemson Team

2017 DuPont Undergraduate Project of the Year: Smart Aiding Application for Travel Safety