Christopher Flathmann, PhD

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

School of Computing
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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. His current interests continue to span the domain, but they heavily revolve around the exploration of the social influence, acceptance, and design of autonomous teammates. Additionally, his work spans various contexts, including software development, education, sports, manufacturing, and command and control. He has published fundamental explorations of critical concepts, such as autonomous teammate etiquette, ethics in human-autonomy teams, human-autonomy team cognition, and shared influence in human-autonomy teams. His research has received multiple best paper awards/nominations and has been published in high-ranking peer-reviewed venues.

CURRICULUM VITAE

Christopher Flathmann

Research Assistant Professor, Human-Centered Computing
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Education

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

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

Appointments

Primary

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

Secondary

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

Achievement Highlights

- Over **15 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, conferences, and funding agencies**.
- Leading **research collaboration with North Atlantic Treaty Organization (NATO).**

Sponsored Research Grants and Gifts

Pending Proposals

2023 Synchronizing Collaborations for Human-Autonomy Teaming and Ethical Autonomy Use. AFOSR DURIP. (Co-I) **$652,806**

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-I) **$1,095,901**

2023 Gemini 2.0. USSF. (Co-I) **$1,095,901**

2023 Clemson University's STEM Teacher Learning Progression (CU-TLP) Extension. DOE. (Senior Personnel) **$2,625,579**

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

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.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.**, B.G. Schelble, Mallick, R., & McNeese, N.J. (2023). Examining the Impact of Varying Levels of AI Teammate Influence on Human-AI Teams. *International Journal of Human-Computer Studies*. https://doi.org/10.1016/j.ijhcs.2023.103061

JA.6 O'Neill, T., **Flathmann, C.**, McNeese, N.J., & Salas, E., (Under Review). 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. (In Press). Investigating AI Teammate's Communication Strategies and Their Impact in Human-AI Teams For Effective Teamwork. *ACM Computer Supported Cooperative Work*.

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**

Under Review

UR.9 Musick, G., Duan, W., **Flathmann, C.**, Knijnenburg, B., & McNeese, N.J., (Under Review). To share or not to share: Understanding and modeling individual disclosure preferences in recommender systems for the workplace. *ACM GROUP*.

UR.8 Zhang, R., Duan, W., **Flathmann, C.**, Freeman, G., Knijnenburg, B., & McNeese, N.J., (Under Review). Verbal vs. Visual: How Humans Perceive and Collaborate with AI Teammates Using Different Communication Modalities in Various Human-AI Team Compositions. *ACM Computer Supported Cooperative Work*.

UR.7 Schelble, B., Lancaster, C., Sengupta, S., Freeman, G., **Flathmann, C.**, & McNeese, N.J., (Under Review). Leveraging AI Teammate Behaviors to Support Effective Team Process Execution and Develop Situational Awareness. *IEEE Transactions on Social Computing Systems*.

UR.6 Lancaster, C., Schulenberg, K., **Flathmann, C.**, & McNeese, N.J., (Under Review). "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*.

UR.5 Geoff, M., Hauptman, A.I., **Flathmann, C.**, McNeese, N.J., Knijnenburg, B. (Under Review). Recommendations with Benefits: Exploring Explanations in Information Sharing Recommender Systems for Temporary Teams. *ACM Transactions on Information Systems*.

UR.4 **Flathmann, C.**, Zhang, R., Wen, D., Hauptman, A., & McNeese, N.J. (Under Review). Empirically Understanding the Potential Impacts and Process of Social Influence in Human-AI Teams. *ACM Computer Supported Cooperative Work*.

UR.3 **Flathmann, C.**, Schelble, B.G., McNeese, N.J., Knijnenberg, B., Gramopadhye, A., & Madathil K.C. (Under Review). The Purposeful Presentation of AI Teammates: Impacts on Human Acceptance and Perception. *International Journal of Human-Computer Interaction*.

UR.2 Zhang, R., **Flathmann, C.**, Musick. G., Schelble, B.G., McNeese, N.J., & Knijnenberg, B. (Under Review). 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*.

UR.1 Mallick, R., **Flathmann, C.**, Lancaster, C., Hauptman, A., McNeese, N.J., & Ihekweazu, C., (Under Review). The Power of Positive AI: Designing next-generation artificial intelligence to adapt to the emotional needs of Human Teammates within Human-Agent Teams *ACM Computer Supported Cooperative Work*.

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 (Refereed):

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.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.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. Office of Naval Research 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.

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 Alyssa Williams 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*)

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

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)

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

2015- Computers in Human Behavior

2021- ACM Transactions on Human-Robot Interaction

2021- Journal of Cognitive Engineering and Decision Making

2022- Journal of Field Robotics

Conferences

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)

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 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