Christopher Flathmann

Curriculum Vitae

✆ *(864) 630 3075*
✉ *cflathm@g.clemson.edu*
🖥 *chrisflathmann.com*

━━━ Education

2019–2023	**PhD, Human Centered Computing**, *Clemson University, Clemson, South Carolina*. Advisor: **Nathan McNeese**; Planned Defense: February 2023
2018	**BS Computer Science**, *Clemson University, Clemson, South Carolina*.

━━━ Work Experience

2019–Present	**Clemson University** Graduate Research Assistant, **Team Research Analytics in Computational Environments (TRACE)**. Senior Lead PhD student researching human-AI teamwork and AI influence. Responsibilities include leading research projects, developing funding proposals, and leading external collaborations.
2018	**Clemson University** Undergraduate Research Assistant, **Data Intensive Computing Ecosystems Lab**. Researched the effects of latency on high performance computing clusters in commercial cloud environments with **Dr. Amy Apon**.
2018	**Amazon** Software Development Engineer Intern, Financial Technology. Created and evaluated a system for email matching payments and responses for financial collections using AWS EC2, S3, and Lambda.
2017	**Clemson University** Undergraduate Teaching Assistant for Algorithms and Data Structures in C++ for **Dr. Brian Dean.** Taught labs, held office hours for undergraduate students, and helped design and proctor programming exams.
2017	**Michelin** Software Development Engineer Intern for Research and Development. Designed software in C# to manage Agile Teams' members, software responsibilities, and skills.

━━━ Research Interests

AI Influence on Humans, Human-Centered AI, Applied Human-AI Teamwork, Ethical Design of AI

━━━ Grant and Award Contribution

Funded	The Spread of Trust and Distrust in Distributed Human-Autonomy Teaming Constellations. AFOSR. **$1,302,657**
Funded	Connecting and Leveraging Physical and Digital Dimensions to Advance Human-Autonomy Teaming. ONR DURIP. **$295,792**

Funded	Promoting Human Interpretation and Interaction to Mitigate Bias in Artificial Intelligence Assisted Decision Aids. ONR. **$444,368**
Funded	Considerations of Ethical and Unethical Behavior on Trust in Human-Autonomy Teaming. AFOSR. **$586,538**
Under Review	A Multidisciplinary Approach to Improving Patient Safety in Pre-Hospital Care Settings Using Human-Centered Design and Systems Engineering Methods. AHRQ. **$1,999,877**
Under Review	CAREER: Prioritizing the Development of Team Cognition in Human-AI Teams to Engender the Advancement and Acceptance of AI Teammates. NSF. **$580,226**
Rejected	Cyber: Internet of People and Things - Collaborative Intelligence through Human-AI Team Building. NSF. **$3,000,000**
Rejected	Multi-head Distributional Decision Maker Modeling for Human-Off-The-Loop Algorithmic Development. DARPA. **$1,112,701**
Rejected	Artificial Intelligence Institute for Advances in Human-AI Decision Making at Scale (HAIMS). NSF. **$417,252**

Publications

Proposed Dissertation

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 (Dean's Professor), Brian Dean (School of Computing Director), Eileen Kraemer (Former School of Computing Director), Brygg Ullmer (Human-Centered Computing Chair), Laine Mears (BMW Endowed Chair in Automotive Manufacturing)

Referred Journal Articles

[J.3] Schelble, B., **Flathmann, C.**, McNeese, N.J., O'Neill, T., Pak, R., & Namara, M. (2022; accepted). Investigating the Effects of Perceived Teammate Artificiality on Human Performance and Cognition. *International Journal of Human-Computer Interaction*.

[J.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.

🏆 [J.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.8] **Flathmann, C.**, McNeese, N.J., Schelble, B.G., Knijnenberg, B., & Freeman, G. (Major Revision). Understanding the Pervasive Impact of AI Teammate Assertiveness on Human-Agent Teams. *Human Computer Interaction Journal*.

[UR.7] **Flathmann, C.**, B.G. Schelble, Mallic, R., & McNeese, N.J. (Under Review). Examining the Impact of Varying Levels of AI Teammate Influence on Human-AI Teams. *International Journal of Human-Computer Studies*.

[UR.6] **Flathmann, C.**, Zhang, R., Wen, D., Hauptman, A., & McNeese, N.J. (Under Review). Understanding How and Why Humans Respond to Social Influence Exerted by AI Teammates. *ACM Computer Supported Cooperative Work*.

[UR.5] **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.4] Zhang, R., Wen, D., **Flathmann, C.**, Freeman, G., & McNeese, N.J. (Under Review). Investigating AI Teammate's Communication Strategies and Their Impact in Human-AI Teams For Effective Teamwork. *ACM Computer Supported Cooperative Work*.

[UR.3] 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.2] 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*.

[UR.1] Thomas, O., **Flathmann, C.**, McNeese, N.J., & Salas, E., (Under Review). Human-Autonomy Teaming: Construct Validity and A Generalizable Model for the Field *Computers in Human Behavior*.

Book Chapters

[B.2] **Flathmann, C.**, Schelble, B.G., & McNeese, N.J. (in press). Refocusing Human-AI Interaction Through a Teamwork Lens. Book Chapter in *Handbook on Virtual Work*. Edward Elgar Publishing.

[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 Papers

[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*.

[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 (Refereed)

[W.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.

[W.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.

[W.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.

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.

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

Funding and Awards

2020-2022	2 Best Paper Nominations: HICSS & ACM GROUP
2020	**Human-Agent Interaction Best Paper Award**
2019 - 2020	NSF/NRT **Technology-Human Integrated Knowledge Education and Research** Fellow
2019	Clemson **Three Minute Thesis** Finalist for the College of Computing, Engineering, and Applied Science
2017	DuPont Undergraduate Project of the Year: Smart Aiding Application for Travel Safety

Skills

Research	Quantitative Research (In Person Experiments, Factorial Survey Experiments, Online System A/B Testing, SEM, MLM, ANOVAs), Qualitative Research (Focus Groups, Semi-Structured Interviews, Thematic Analysis), Wizard of Oz, Experiment Design
Programming	Python, C#, SQL, Java, C++, C, R, JavaScript
ML Methods	Logistic Regression, Support Vector Machines, Neural Networks, Reinforcement Learning
Tools	Tensorflow (Including Real-Time Computer Vision), Tensorforce, GitHub, AWS, Node.js, Qualitrics, Linux HPC Environments

Current Funding Project

Clemson University Teacher Learning Progression Recommender System
Collaborators: Nathan McNeese, Bart Knijenberg, Reza Anaraky, CU Education Department

- Researching, designing, and implementing an intelligent recommender system with the goal of guiding and aiding in the professional development of South Carolina middle school teachers. Main responsibilities include the development of recommender system and A/B testing recommender system and its presentation. Implementation and Evaluation of the system uses real-world school teachers.

Relevant Coursework

- Artificial Intelligence (Included manual creation of neural networks and reinforcement learning systems
- Digital and Smart Manufacturing
- Measurement and Evaluation of Human Centered Computing Systems
- Research Methods for Human Centered Computing
- The Science of Teamwork and Technology
- Teamwork in Manufacturing
- Applied Data Science
- Human Perceptions and Behaviors

Teaching Experience

Courses Taught
- Repeated Guest Lecturer CPSC 4140: Human and Computer Interaction (Fall 2021)
- Guest Lecturer for HCC 8500: The Science of Teamwork and Technology (Spring 2021)
- Graduate Assistant Lecturer on AI Technology for AMFG 6200: Collaboration and Teamwork in Manufactoring Systems (Fall 2020 & Fall 2021)
- Undergraduate Teaching Assistant for CPSC 2120: Algorithms and Data Structures (Spring 2017 & Fall 2017)

Student Mentoring
THINKER Mentor Program
- Geoffery Musick- PhD Human-Centered Computing, *Clemson University, Fall 2021 - 2022*
- Steven Russell- BA Computer Science, *Clemson University, Fall 2020 - 2022*

TRACE Research Group
- Rohit Mallick- PhD Human-Centered Computing, *Clemson University, Fall 2021 - Present*
- Jake Macdonald- BS Computer Science, *Clemson University, Fall 2022 - Present*
- Christian Ihekweazu - BS Computer Science, *Clemson University, Fall 2022 - Present*
- Casey Hird- BS Math, *Clemson University, Fall 2019 - Spring 2020*
- Dylan Cathapermal- BS Computer Science, *Clemson University, Fall 2019 - Spring 2020*

Professional Activities

Program Committees
User Modeling Adaptation and Personalization (UMAP) Late Breaking Results, 2023

Reviewing
Journals
Computers and Human Behavior, since 2022
Journal of Field Robotics, since 2022
Transactions on Human-Robot Interaction, since 2021
Journal of Cognitive Engineering and Decision Making, since 2021
Human Factors, since 2020

Conferences
ACM Computer-Human Interaction (CHI), since 2021
ACM/IEEE Human-Robot Interaction (HRI), since 2021
IEEE International Conference on Tools with Artificial Intelligence (ICTAI), since 2021
ACM Computer Supported Cooperative Work (GROUP), since 2020
Human Factors and Ergonomics Society Annual Meeting (HFES), since 2020
Winter Simulations Conference (WSC), since 2020
Military Health System Research Symposium (MHSRS), since 2020

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