Stephen J. Hutt **Assistant Professor**

CONTACT INFORMATION
2155 E Wesley Ave
Denver, CO, 80210, USA
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stephen.hutt@du.edu

EDUCATION

University of Colorado, Boulder, Boulder, CO

Ph.D., Computer Science, August 2020

Thesis Topic: *Scaling Up: Moving Automated Gaze-Based Engagement Detection Out Of the Lab*
Advisor: Sidney D'Mello, Ph.D

University of York, York, United Kingdom

M.Eng.,*First Class Honours* Computer Science with Artificial Intelligence, July 2015

Thesis Topic: *Evolutionary Techniques for Developing Computer Poker Agents*
Advisor: Dan Franks, Ph.D

University of California, Santa Cruz, Santa Cruz, CA

Exchange Year, Computer Science, 2012-2013

RESEARCH INTERESTS

Learning Analytics, Machine Learning, Affective Computing, Fair AI, Adaptive Learning Technologies, Learning Sciences, Human Computer Interaction

RESEARCH EXPERIENCE

Assistant Professor September 2022 - Present
Department of Computer Science
University of Denver

I lead a small research team investigating Human Centered AI, with a focus on educational applications and educational technologies. I work with a variety of external collaborators in fields of Computer Science, Learning Science, Psychology, and Cognitive Science.

Assistant Director August 2021 - August 2022
Penn Center for Learning Analytics
University of Pennsylvania

I held leadership role within the center, mentoring and supporting students while also maintaining my own research. I provide guidance and feedback to both PhD and Masters students affiliated with the Center. I also support the broader research goals of the center and center funding proposals. I worked closely with the devlopment team for the MOOC Replication Framework (MORF) - a data repository and analysis framework - and assist external researchers wishing to leverage MORF for their work.

Postdoctoral Researcher August 2020 - August 2022
Graduate School of Education,
University of Pennsylvania
Supervisor: Ryan Baker, Ph.D

Conductedresearch at the intersection of Artificial Intelligence and Education. Used Computer Science knowledge and techniques to create educational software and experiences that are both dynamic and beneficial for the learner. This research had a special focus on the fair treatment of students who are members of underrepresented groups.

PhD Researcher January 2018 - August 2020
Institute of Cognitive Science,
University of Colorado, Boulder
Supervisor: Sidney D'Mello, Ph.D

Explored how artificial intelligence and big data techniques can apply in education. Researched Fair AI in the context of educational software and worked with two large-scale datasets to explore how current methods commonly used in education contexts scale up. Designed and implemented real-time gaze-based Mind Wandering detection and interventions.

PhD Researcher September 2015 to August 2017
Department of Computer Science,
University of Notre Dame
Supervisor: Sidney D'Mello, Ph.D

Designed and implemented a multimodal experiment on detecting affect and engagement during classroom learning. Collected eye gaze, video, and interaction data from students whilst they interacted with a Biology Intelligent Tutoring System. Built machine learning models of mind wandering using eye gaze data of students interacting with computers in multiple tasks.

Masters Researcher September 2014 to July 2015
Department of Computer Science,
University of York
Supervisor: Dan Franks, Ph.D

Designed and implemented a framework to train agents to play Texas Hold'em poker. Using genetic algorithms and evolutionary computation approaches, I trained multiple agents playing against each other as well as expert and pre-trained agents.

JOURNAL ARTICLES

1. **S. Hutt**, R. S. Baker, M. M. Ashenafi, J. M. Andres-Bray, and C. Brooks, "Controlled outputs, full data: A privacy-protecting infrastructure for mooc data," *British Journal of Educational Technology*, vol. 53, no. 4, pp. 756–775, 2022. DOI: https://doi.org/10.1111/bjet.13231

2. Y. Zhang, L. Paquette, N. Bosch, J. Ocumpaugh, G. Biswas, **S. Hutt**, and R. S. Baker, "The evolution of metacognitive strategy use in an open-ended learning environment: Do prior domain knowledge and motivation play a role?" *Contemporary Educational Psychology*, vol. 69, p. 102 064, 2022, ISSN: 0361-476X. DOI: https://doi.org/10.1016/j.cedpsych.2022.102064

3. M. Gardener, **S. Hutt**, D. Kamentz, A. L. Duckworth, and S. K. D'Mello, "How does high school extracurricular participation predict bachelor's degree attainment? it's complicated," *Journal of Research on Adolesence*, 2020. DOI: 10.1111/jora.12557

4. **S. Hutt**, K. Krasich, C. Mills, N. Bosch, S. White, J. R. Brockmole, and S. K. D'Mello, "Automated gaze-based mind wandering detection during computerized learning in classrooms," *User Modeling and User-Adapted Interaction*, Jun. 2019, ISSN: 1573-1391. DOI: 10.1007/s11257-019-09228-5

5. B. M. Galla, E. P. Shulman, B. Plummer, M. Gardner, **S. Hutt**, J. Goyer, A. Finn, S. D'Mello, and A. Duckworth, "Why high school grades are better predictors of on-time college graduation than are admissions test scores: The role of self-regulation and cognitive ability.," *American Educational Research Journal*, 2019. DOI: 10.3102/0002831219843292

6. K. Krasich, R. McManus, **S. Hutt**, M. Faber, S. K. D'Mello, and J. R. Brockmole, "Gaze-based signatures of mind wandering during real-world scene processing," *Journal of Experimental Psychology: General*, vol. 147, no. 8, p. 1111, 2018. DOI: 10.1037/xge0000411

CONFERENCE PUBLICATIONS - STRICTLY PEER REVIEWED

7. **S. Hutt** and S. K. D'Mello, "Evaluating calibration-free webcam-based eye tracking for gaze-based user modeling," in *Proceedings of the 22nd ACM International Conference on Multimodal Interaction (ICMI 2020)*, New York, NY, USA: Association for Computing Machinery, In Press
8. M. He, R. S. Baker, **S. Hutt**, and J. Zhang, "A less overconservative method for reliability estimation for cohen's kappa," in *Proceedings of the 4th International Conference on Quantitative Ethnography*, In Press
9. R. S. Baker, **S. Hutt**, M. Mogessie, and H. Valayaputtar, "Research using the mooc replication framework and e-trials," in *2022 IEEE Learning With MOOCS (LWMOOCS)*, In Press
10. J. Zhang, J. M. A. L. Andres, **S. Hutt**, R. S. Baker, J. Ocumpaugh, C. Mills, J. Brooks, S. Sethuraman, and T. Young, "Detecting smart model cognitive operations in mathematical problem-solving process," in *Proceedings of the International Conference on Educational Data Mining*, 2022 **- Nominated for Best Paper Award**
11. N. Levin, R. S. Baker, N. Nasiar, S. Fancsali, and **S. Hutt**, "Evaluating gaming detector model robustness over time," in *Proceedings of the International Conference on Educational Data Mining*, 2022
12. J. Zhang, **S. Hutt**, J. Ocumpaugh, N. Henderson, A. Golsen, J. Rowe, K. Boyer, E. Wiebe, B. Mott, and J. Lester, "Investigating student interest and engagement in game-based learning environments," in *Proceedings of the International Conference on Artificial Intelligence and Education*, 2022
13. **S. Hutt**, A. E. Stewart, J. Gregg, S. Mattingly, and S. K. D'Mello, "Feasibility of longitudinal eye-gaze tracking in the workplace," *Proc. ACM Hum.-Comput. Interact.*, vol. 6, no. ETRA, May 2022. DOI: 10.1145/3530889. [Online]. Available: https://doi.org/10.1145/3530889
14. J. M. A. L. Andres, **S. Hutt**, J. L. Ocumpaugh, R. S. Baker, N. Naisar, and C. Porter, "How anxiety affects affect: A quantitative ethnographic investigation using affect detectors and data-targeted interviews," in *Proceedings of the 3rd International Conference on Quantitative Ethnography*, 2021
15. J. L. Ocumpaugh, **S. Hutt**, J. M. A. L. Andres, R. S. Baker, G. Biswas, N. Bosch, L. Paquette, and A. Munshi, "Using qualitative data from targeted interviews to inform rapid aied development," in *Proceedings of the 29th International Conference on Computers in Education*, 2021
16. **S. Hutt**, J. Ocumpaugh, J. M. A. L. Andres, A. Munshi, N. Bosch, R. S. Baker, Y. Zhang, L. Paquette, S. Slater, and G. Biswas, "Who's stopping you? - using microanalysis to explore the impact of science anxiety on self-regulated learning operations," in *Proceedings of the 43rd Annual Conference of the Cognitive Science Society*, 2021
17. **S. Hutt**, J. Ocumpaugh, J. M. A. L. Andres, N. Bosch, L. Paquette, G. Biswas, and R. S. Baker, "Sharpest tool in the shed: Investigating smart models of self-regulation and their impact on learning," in *Proceedings of the International Conference on Educational Data Mining*, 2021

18. Y. Zhou, J. Andres-Bray, **S. Hutt**, K. Ostrow, and R. S. Baker, "A comparison of hints vs. scaffolding in a mooc with adult learners," in *Proceedings of the International Conference on Artificial Intelligence and Education.*, 2021, pp. 427–432

19. R. S. Baker, B. McLaren, **S. Hutt**, J. Richey, E. Rowe, M. Almeda, M. Mogessie, and J. M. A. L. Andres, "Towards sharing student models across learning systems," in *Proceedings of the International Conference on Artificial Intelligence and Education.*, 2021, pp. 60–65

20. R. S. Baker, N. Nasiar, J. L. Ocumpaugh, **S. Hutt**, J. M. A. L. Andres, S. Slater, M. Schofield, A. Moore, L. Paquette, A. Munshi, and G. Biswas, "Affect-targeted interviews for understanding student frustration," in *Proceedings of the International Conference on Artificial Intelligence and Education.*, 2021, pp. 52–63 **- Best Paper Award**

21. **S. Hutt**, K. Krasich, J. R. Brockmole, and S. K. D'Mello, "Breaking out of the lab: Mitigating mind wandering with gaze-based attention-aware technology in classrooms," CHI '21, Yokohama, Japan: Association for Computing Machinery, 2021, ISBN: 9781450380966. DOI: 10.1145/3411764.3445269

22. E. Jensen, T. Umada, N. C. Hunkins, **S. Hutt**, A. C. Huggins-Manley, and S. K. D'Mello, "What you do predicts how you do: Prospectively modeling student quiz performance using activity features in an online learning environment," in *LAK21: 11th International Learning Analytics and Knowledge Conference*, LAK21, Irvine, CA, USA: Association for Computing Machinery, 2021, pp. 121–131, ISBN: 9781450389358. DOI: 10.1145/3448139.3448151

23. **S. Hutt**, M. Gardner, A. L. Duckworth, and S. K. D'Mello, "Evaluating fairness and generalizability in models predicting on-time graduation from college applications," in *Proceedings of the 12th International Conference on Educational Data Mining. International Educational Data Mining Society.*, C. F. Lynch, A. Merceron, M. Desmarais, and R. Nkambou, Eds., 2019, pp. 79–88

24. E. Jensen, **S. Hutt**, and S. K. D'Mello, "Generalizability of sensor-free affect detection models in a longitudinal dataset of tens of thousands of students," in *Proceedings of the 12th International Conference on Educational Data Mining. International Educational Data Mining Society.*, C. F. Lynch, A. Merceron, M. Desmarais, and R. Nkambou, Eds., 2019, pp. 324–329

25. **S. Hutt**, J. F. Grafsgaard, and S. K. D'Mello, "Time to scale: Generalizable affect detection for tens of thousands of students across an entire school year," in *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI '19, Glasgow, Scotland UK: ACM, 2019, 496:1–496:14, ISBN: 978-1-4503-5970-2. DOI: 10.1145/3290605.3300726

26. C. Stone, A. Quirk, M. Gardener, **S. Hutt**, A. L. Duckworth, and S. K. D'Mello, "Language as thought: Using natural language processing to model noncognitive traits that predict college success," in *Proceedings of the 9th International Conference on Learning Analytics & Knowledge*, LAK19, Tempe, AZ, USA: ACM, 2019, pp. 320–329, ISBN: 978-1-4503-6256-6. DOI: 10.1145/3303772.3303801

27. K. Krasich, **S. Hutt**, C. Mills, C. A. Spann, J. R. Brockmole, and S. K. D'Mello, "MindTS: Testing a brief mindfulness intervention with an intelligent tutoring system," in *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED'18)*, London, UK, Jun. 2018

28. **S. Hutt**, M. Gardener, D. Kamentz, A. L. Duckworth, and S. K. D'Mello, "Prospectively predicting 4-year college graduation from student applications," in *Proceedings of the 8th International Conference on Learning Analytics and Knowledge*, LAK '18, Sydney, New South Wales, Australia: ACM, 2018, pp. 280–289, ISBN: 978-1-4503-6400-3. DOI: 10.1145/3170358.3170395

29. J. DeBenedetto, **S. Hutt**, L. Faust, A. Liu, and N. Kremer-Herman, "Placating plato with plates of pasta: An interactive tool for teaching the dining philosophers problem," in *2017 IEEE Frontiers in Education Conference (FIE)*, Oct. 2017, pp. 1–9. DOI: 10.1109/FIE.2017.8190443

30. **S. Hutt**, C. Mills, N. Bosch, K. Krasich, J. Brockmole, and S. D'Mello, "Out of the fr-eye-ing pan: Towards gaze-based models of attention during learning with technology in the classroom," in *Proceedings of the 25th Conference on User Modeling, Adaptation and Personalization*, UMAP '17, Bratislava, Slovakia: ACM, 2017, pp. 94–103, ISBN: 978-1-4503-4635-1. DOI: 10.1145/3079628.3079669 **- Best Student Paper Award**

31. **S. Hutt**, J. Hardey, R. Bixler, A. Stewart, E. Risko, and S. K. D'Mello, "Gaze-based detection of mind wandering during lecture viewing," in *Proceedings of the 10th International Conference on Educational Data Mining. International Educational Data Mining Society.*, 2017

32. **S. Hutt**, C. Mills, S. White, P. J. Donnelly, and S. K. D'Mello, "The Eyes Have It: Gaze-based Detection of Mind Wandering during Learning with an Intelligent Tutoring System.," in *Proceedings of the 9th International Conference on Educational Data Mining. International Educational Data Mining Society.*, T. Barnes, M. Chi, and M. Feng, Eds., 2016, pp. 86–93

Book Chapters

33. **S. Hutt**, R. S. Baker, J. Ocumpaugh, A. Munshi, J. M. A. L. Andres, S. Karumbaiah, S. Slater, G. Biswas, L. Paquette, N. Bosch, and M. van Velsen, "Quick red fox: An app supporting a new paradigm in qualitative research on aied for stem," in *Artificial Intelligence in STEM Education:The Paradigmatic Shifts in Research, Education and Technology*, In Press

Workshop Papers

34. **S. Hutt**, S. Karumbaiah, and J. L. Ocumpaugh, "Optimizing philosophies for predictive models in learning analytics," in *LAK21: 11th International Learning Analytics and Knowledge Conference - Companion Proceedings*, LAK21, 2021, pp. 325–326

Selected Conference Presentations

35. **S. Hutt**, R. S. Baker, M. Mogessie, and H. Valayaputtar, *Tools for mooc data analysis and experimentation at the university of pennsylvania*, International Conference on Artificial Intelligence and Education, Durham, UK, Jul. 2022

36. J. R. Brockmole, K. Krasich, **S. Hutt**, and S. K. D'Mello, *Attention-aware cyberlearning to detect and combat wandering minds.* 59th Annual Meeting of the Psychonomic Society., New Orleans, LA, USA, Nov. 2018

37. A. Quirk, **S. Hutt**, M. Gardner, A. Duckworth, and S. K. D'Mello, *Analyzing open-ended descriptions of extracurricular participation for evidence of character development*, Promoting Character Development Among Diverse Children and Adolescents: The Roles of Families, Schools, and Out-Of-School-Time Youth Development Programs, Philadelphia, PA, USA., Oct. 2018

38. B. M. Galla, R. N. Baelen, H. Fiore, **S. Hutt**, and A. Shenhav, *Compared to self-immersion, mindfulness reduces social media desires and boosts academic self-control in undergraduates*, International Symposium for Contemplative Research (ISCR), Arizona, USA, Nov. 2018

39. K. Krasich, R. McManus, **S. Hutt**, M. Faber, S. K. D'Mello, and J. R. Brockmole, *Gaze-based indices of mind wandering during real-world scene processing.* Annual Workshop on Object Perception, Attention, and Memory., Vancouver, BC, Canada., Nov. 2017

Invited Presentations

40. J. L. Ocumpaugh, **S. Hutt**, A. Munshi, R. S. Baker, G. Biswas, and L. Paquette, *Quick red fox : Optimizing classroom interviews with srl and affect detection*, Learning Analytics Learning Network, Aug. 2021

Manuscripts In Review

41. B. Lira, A. L. Duckworth, M. Gardener, A. Quirk, C. Stone, A. Rao, **S. Hutt**, and S. K. D'Mello, "Using machine learning to identify personal qualities in college applications at scale," *Education Researcher*, In Review

Funding

Gary Marsden Travel Award — June 2022
$1,600
SIGCHI

Department of Computer Science Student Travel Award — May 2019
$1,600
University of Colorado Boulder

Department of Computer Science Student Travel Award — March 2018
$1,000
University of Colorado Boulder

College of Engineering Student Travel Award — March 2018
$400
College of Engineering and Applied Sciences,University of Colorado Boulder

Dean's Graduate Assistantship, CU Boulder — August 2017
$21,800
College of Engineering and Applied Sciences,University of Colorado Boulder

SIGCHI Student Travel Grant — August 2016
$1,800
SIGCHI

Social Responsibilities of Research Fellowship — May 2016
$1,500
John J. Reilly Center for Science, Technology, and Values

Student Travel Scholarship — April 2011
$4,500 (paid in GBP)
University of York

Awards

Best Paper Award, AIED 2021 — June 2021
Outstanding Service Award, Department of Computer Science — May 2019
Outstanding Service Award, Department of Computer Science — May 2018

James Chen Best Student Paper Award, UMAP 2017 July 2017
SIGCHI Student Scholar March 2017
Outstanding Student Award July 2011

TEACHING EXPERIENCE

Assistant Professor Fall '22
Introduction to Artificial Intelligence
Department of Computer Science,
University of Denver

Designed and implemented a broad survey class, considering a range of Artificial techniques, and how they relate to current socio-political discussions. Students engage in regular discussion and debate, as well as programming assignments and building theoretical foundations.

Instructor Spring '19
Introduction to Artificial Intelligence
Department of Computer Science,
University of Colorado Boulder

Designed and implemented the curriculum, assignments and examinations. Held weekly classes, managed course staff of four people, and mentored students during office hours. 106 students enrolled

Teaching Assistant Fall '17
Introduction to Computer Science
Instructor: David Knox, Ph.D
Department of Computer Science,
University of Colorado Boulder

Taught two lab sections with approximately 30 students each, prepared weekly assignments and autograders, assisted with the devlopment of examinations, and mentored students during office hours.

Teaching Assistant Fall '15
Design and Analysis of Algorithms
Instructor: Danny Z. Chen, Ph.D
Department of Computer Science,
University of Notre Dame

Assisted with the development of written assignments and examinations. Mentored students during weekly office hours and review sessions. 94 students enrolled

Tutor Fall '13 - Spring '15
Mathematics and Computer Science
Highcliffe School

PROFESSIONAL MEMBERSHIP

Association for Computing Machinery
International Educational Data Mining Society
International Artificial Intelligence in Education Society
Cognitive Science Society
Society for Learning Analytics Research
ACM Special Interest Group on Computer-Human Interaction (SIGCHI)
ACM Special Interest Group on Computer Science Education (SIGCSE)

JOURNAL REVIEWS

Frontiers in Artificial Intelligence

International Journal of Artificial Intelligence in Education
Computers in Human Behaviour
Advances in Methods and Practices in Psychological Science
Journal of Research on Educational Effectiveness
Review of Research in Education
IEEE Transactions on Visualization and Computer Graphics
Consciousness and Cognition
IEEE Transactions on Learning Technologies
IEEE Transactions on Big Data

CONFERENCE REVIEWS

ACM Symposium on Eye Tracking Research and Applications (ETRA), 2022
International Conference on Educational Data Mining (EDM) 2017, 2018, 2019, 2020
International Conference on Artificial Intelligence in Education (AIED), 2017-2022
International Conference on Multimodal Interaction (ICMI) 2019, 2020
ACM Conference on Computer-Supported Cooperative Work and Social Computing 2019
ACM CHI Conference on Human Factors in Computing Systems 2019-2021

DISSERTATION COMMITTEES

Juan Miguel Andres-Bray — Fall 2021
Graduate School of Education, Univeristy of Pennsylvania

MENTORSHIP

PhD. Students

Juan Miguel Andres-Bray	2020 - 2022
J. M. Alexandra Andres	2020 - Present
Joyce Zhang	2020 - Present

Masters Students

Alexander White	2020 - 2021
Yiqiu Zhou	2020 - 2021
Tetsumichi Umada	2019 - 2020
Phu Dang	2018
Sayali Sonawane	2018

Undergraduate Students

Ray Zhang	2021 - 2022
Alexander Tobias	2021
Frank Stinar	2019 - 2020
David Blair	2017 - 2019
Kendyll Kraus	2017
Jessica Hardey	2016 - 2017

High School Students

Jack Rogers	2019
Connor Malley	2019
Taylor Kovacs	2016-2017

ACADEMIC SERVICE

Broader Research Community

Program Committee, Leaning Analytics and Knowledge 2023
Hybrid Experience Chair, Educational Data Mining 2022

Program Committee, International Conference on Multimodal Interaction 2022
Program Committee, ACM Symposium on Eye Tracking Research and Applications 2022
Program Committee, Educational Data Mining 2022
Program Committee, Artificial Intelligence in Education 2022
Program Committee, International Conference on Multimodal Interaction 2021
Program Committee, Artificial Intelligence in Education 2021
Program Committee, International Conference on Multimodal Interaction 2020
Program Committee, Artificial Intelligence in Education 2020
Program Committee, Educational Data Mining 2020
Local Committee, International Conference on Multimodal Interaction 2018
Program Committee, Educational Data Mining 2017

Department and Institution Level

Student Lead, CS Orientation, CU Boulder, 2019
Student Lead, CS Open House, CU Boulder, 2019
Graduate Committee, Department of Computer Science, CU Boulder, 2017-2019
Chair, Computer Science Graduate Student Association, CU Boulder, 2018, 2019
Committee to review graduate degree requirements, Department of Computer Science, CU Boulder 2018
Founder Member, Computer Science Graduate Student Association, CU Boulder, 2018
Judge, N. Indiana Regional Science and Engineering Fair 2016

Community Service

Board of Directors, Rocky Mountain Arts Association, 2021 - Present
Board Treasurer, Rocky Mountain Arts Association, 2021, 2021 - Present

Professional Experience

Senior Timetabling Assistant & Curriculum Support March 2014 - July 2017
Highcliffe School

Worked with Senior & Middle Management to implement a curriculum model that satisfies national and internal constraints. Managed post-16 curriculum enrolment, insuring that all legal requirements were met and that students had a suitable program of study. Developed of a variety of online education solutions.

IT Technician & Timetabling Assistant July 2011 - March 2014
Highcliffe School

Worked with a wide variety of stakeholders to provide IT solutions. Communicated with users with a variety of skill levels and devloping solutions to complex education problems.