

# Danula Hettiachchi

Crowdsourcing · Social Computing · HCI · Fair & Responsible AI

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🌐 danula | 🎓 Danula Hettiachchi

I am a researcher interested in crowdsourcing, social computing and fairness in automated decision-making. I have extensive research experience in human-computer interaction, including quantitative methods and user studies complemented with prior industry experience in machine learning, data engineering, software development and analytics.

## Work Experience

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### Academic Appointments

#### Lecturer, RMIT University

RMIT School of Computing Technologies.

Melbourne, Australia

Nov 2023 - Present

#### Research Fellow, RMIT University

Working at the ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) and RMIT School of Computing Technologies (Academic Level B).

Melbourne, Australia

Mar 2021 - Nov 2023

### Industry Experience, Academic Visits and Internships

#### Visiting Academic, New York University

Working on user perceptions of fair ranking approaches at the NYU Center for Data Science.

New York, US

Sep 2023 - Oct 2023

#### Applied Scientist Intern, Amazon Web Services (AWS)

Part of Amazon Science team overseeing Amazon GroundTruth, Mechanical Turk and Augmented AI.

Seattle, US (Remote)

Jun 2020 - Nov 2020

#### Casual Academic, The University of Melbourne

Tutor for courses including Machine Learning, Knowledge Technologies and Social Computing.

Melbourne, Australia

Jul 2018 - Jun 2020

#### Manager - Usability Lab, Interaction Design Lab, The University of Melbourne

Supported HCI teaching and research, including eye-tracking and sensing user studies.

Melbourne, Australia

Jun 2018 - Jan 2020

#### Software Engineer, Sysco Labs (A Sysco Company)

Part of the data and analytics team managing a real-time ETL solution and a data warehouse. Principal engineer of customer profiling project that generates customer insights for over 2000 restaurants.

Colombo, Sri Lanka

Apr 2016 - Feb 2018

#### Visiting Instructor, Dept. of Computer Science and Engineering, University of Moratuwa

For Database Systems and Presentation Skills.

Moratuwa, Sri Lanka

Apr 2015 - Feb 2016

#### Google Summer of Code Intern, WSO2

Integrated a data cleaning tool to WSO2 Machine Learner using data transformations in Apache Spark.

Colombo, Sri Lanka

May 2015 - Sep 2015

#### Software Engineering Intern, WSO2

Built an R extension for WSO2 Machine Learner to generate and run machine learning algorithms in R.

Colombo, Sri Lanka

Oct 2014 - Apr 2015

## Education

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#### PhD in Engineering, School of Computing and Information Systems, The University of Melbourne

Thesis on task assignment using worker cognitive ability and context to improve data quality in crowdsourcing. Supervised by Dr. Jorge Goncalves and Prof. Vassilis Kostakos.

Melbourne, Australia

Feb 2018 - Feb 2021

#### BSc (Hons) Engineering, Dept. of Computer Science and Engineering, University of Moratuwa

First Class. Specialised in Computer Science and Engineering.

Sri Lanka

Oct 2011 - Apr 2016

# Peer-reviewed Publications

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## Journal Articles

- Sarsenbayeva, Z., van Berkel, N., **Hettiachchi, D.**, Tag, B., Velloso, E., Goncalves, J., & Kostakos, V. (2023). Mapping 20 years of accessibility research in HCI: A co-word analysis. *International Journal of Human-Computer Studies (IJHCS)*, 103018. [Q1]
- Hettiachchi, D.**, Kostakos, V., & Goncalves, J. (2022). A Survey on Task Assignment in Crowdsourcing. *ACM Computing Surveys*, 55(3), 1-35. [Q1]
- Hettiachchi, D.**, Schaekermann, M., McKinney, T., & Lease, M. (2021). The Challenge of Variable Effort Crowdsourcing and How Visible Gold Can Help. *Proceedings of the ACM on Human-Computer Interaction*, 5(CSCW), 332:1-332-26. [Q1]
- Hettiachchi, D.**, Hayes, L., Goncalves, J., & Kostakos, V. (2021). Team Dynamics in Hospital Workflows: An Exploratory Study of a Smartphone Task Manager. *JMIR Medical Informatics*, 9(8), e28245. [Q2]
- Paananen, V., Oppenlaender, J., Goncalves, J., **Hettiachchi, D.**, Hosio, S. (2021). Investigating Human Scale Spatial Experience. *Proceedings of the ACM on Human-Computer Interaction*, 5 (ISS), 496:1-496:18. [Q1]
- Hettiachchi, D.**, van Berkel, N., Kostakos, V., & Goncalves, J. (2020). CrowdCog: A Cognitive Skill based System for Heterogeneous Task Assignment and Recommendation in Crowdsourcing. *Proceedings of the ACM on Human-Computer Interaction*, 4(CSCW), 110:1-110:21. [Q1]
- Wijenayake, S., **Hettiachchi, D.**, Hosio, S., Kostakos, V., & Goncalves, J. (2020). Effect of Conformity on Perceived Trustworthiness of News in Social Media. *IEEE Internet Computing*, 25(1), 12-19. [Q1]
- van Berkel, N., Goncalves, J., **Hettiachchi, D.**, Wijenayake, S., Kelly, R. M., & Kostakos, V. (2019). Crowdsourcing Perceptions of Fair Predictors for Machine Learning: A Recidivism Case Study. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW), 28:1-28:21. [Q1]
- Sarsenbayeva, Z., van Berkel, N., **Hettiachchi, D.**, Jiang, W., Dingler, T., Velloso, E., Kostakos, V., & Goncalves, J. (2019). Measuring the Effects of Stress on Mobile Interaction. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 3(1), 24:1-24:18. [Q2]

## Conference Papers

- Hettiachchi, D.**, Ji, K., Kennedy, J., McCosker, A., Salim, F., Sanderson, M., Scholer, F., & Spina, D. (2023). Designing and Evaluating Presentation Strategies for Fact-Checked Content. In *Proceedings of the 32nd ACM International Conference on Information and Knowledge Management (CIKM'23)* (pp. 751-761). ACM.
- Hettiachchi, D.**, Holcombe-James, I., Livingstone, S., de Silva, A., Lease, M., Salim, F., & Sanderson, M. (2023). How Crowd Worker Factors Influence Subjective Annotations: A Study of Tagging Misogynistic Hate Speech in Tweets. In *Proceedings of the 11th AAAI Conference on Human Computation and Crowdsourcing (HCOMP'23)* (Vol. 11, No. 1, pp. 38-50). AAAI.
- Wijenayake, S., **Hettiachchi, D.**, & Goncalves, J. (2023). Combining Worker Factors for Heterogeneous Crowd Task Assignment. In *Proceedings of the 2023 ACM Web Conference (WWW'23)* (pp. 3794-3805). ACM.
- Kegalle, H., **Hettiachchi, D.**, Chan, J., Salim, F., & Sanderson, M. (2023). Are Footpaths Encroached by Shared e-Scooters? Spatio-temporal Analysis of Micro-mobility Services. In *Proceedings of the 24th IEEE International Conference on Mobile Data Management (MDM'23)* (pp. 255-264). IEEE.
- Ji, K., Spina, D., **Hettiachchi, D.**, Salim, F., & Scholer, F. (2023). Examining the Impact of Uncontrolled Variables on Physiological Signals in User Studies for Information Processing Activities. In *Proceedings of the 46th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR'23)* (pp. 1971-1975). ACM.
- Cherumanal, S. P., Ji, K., **Hettiachchi, D.**, Trippas, J. R., Scholer, F., & Spina, D. (2023). RMIT\_IR at the NTCIR-17 FairWeb-1 Task. *Proceedings of the 17th NTCIR Conference on Evaluation of Information Access Technologies (NTCIR 17)*.
- Seneviratne, S., Kasthuriarachchi, N., Rasnayaka, S., **Hettiachchi, D.**, & Shariffdeen R. (2022). Does a Face Mask Protect my Privacy?: Deep Learning to Predict Protected Attributes from Masked Face Images. In *Australasian Joint Conference on Artificial Intelligence (AJCAI'22)* (pp. 91-102). Springer, Cham.
- Hettiachchi, D.**, Arora, T., & Goncalves, J., (2021). Us vs. Them - Understanding the Impact of Homophily in Political Discussions on Twitter. In *IFIP Conference on Human-Computer Interaction (Interact'21)* (pp. 476-497). Springer, Cham.
- Hettiachchi, D.**, Sarsenbayeva, Z., Allison, F., van Berkel, N., Dingler, T., Marini, G., Kostakos, V., & Goncalves, J. (2020). "Hi! I am the Crowd Tasker" Crowdsourcing through Digital Voice Assistants. In *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems 2020 (CHI'20)* (pp. 1-14). ACM.
- Hettiachchi, D.**, Wijenayake, S., Hosio, S., Kostakos, V., & Goncalves, J. (2020). How Context Influences Cross-Device Task Acceptance in Crowd Work. In *Proceedings of the AAAI Conference on Human Computation and Crowdsourcing (HCOMP'20)* (Vol. 8, No. 1, pp. 53-62). AAAI.
- Hettiachchi, D.**, van Berkel, N., Hosio, S., López, M. B., Kostakos, V., & Goncalves, J. (2020). Augmenting Automated Kinship Verification with Targeted Human Input. In *PACIS* (p. 141).
- Hettiachchi, D.**, van Berkel, N., Hosio, S., Kostakos, V., & Goncalves, J. (2019). Effect of Cognitive Abilities on Crowdsourcing Task Performance. In *IFIP Conference on Human-Computer Interaction (Interact'19)* (pp. 442-464). Springer, Cham.
- Sarsenbayeva, Z., van Berkel, N., Jiang, W., **Hettiachchi, D.**, Kostakos, V., & Goncalves, J. (2019). In *IFIP Conference on Human-Computer Interaction (Interact'19)* (pp. 465-475). Springer, Cham.

**Hettiachchi, D.**, & Goncalves, J. (2019). Towards Effective Crowd-Powered Online Content Moderation. In Proceedings of the 31st Australian Conference on Computer-Human Interaction (**OzCHI'19**) (pp. 342-346). ACM.

### Workshops, Workshop Papers and Other

Small, E., Yueqing, X., **Hettiachchi, D.**, & Sokol, K. (2023). Helpful, Misleading or Confusing: How Humans Perceive Fundamental Building Blocks of Artificial Intelligence Explanations. In Proceedings of ACM **CHI'23 Workshop** on Human-Centered Explainable AI (HCXAI).

Ji, K., Spina, D., **Hettiachchi, D.**, Salim, F., & Scholer, F. (2023). Towards Detecting Tonic Information Processing Activities with Physiological Data. In Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing and the 2023 ACM International Symposium on Wearable Computers (**UbiComp/ISWC '23 Adjunct**). ACM.

Alorwu, A., Savage, S., van Berkel, N., Ustalov, D., Drutsa, A., Oppenlaender, J., Bates, O., **Hettiachchi, D.**, Gadiraju, U., Goncalves, J., Hosio, S. (2022). Reimagining Global Crowdsourcing for Better Human-AI Collaboration. In Adjunct Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (**CHI'22 EA**). ACM.

**Hettiachchi, D.**, Sanderson, M., Goncalves, J., Hosio, S., Kazai, G., Lease, M., Schaekermann, M., & Yilmaz, E. (2021). Investigating and Mitigating Biases in Crowdsourced Data. Companion Publication of the 2021 Conference on Computer Supported Cooperative Work and Social Computing (**CSCW '21 Companion**). ACM.

**Hettiachchi, D.**, van Berkel, N., Dingler, T., Allison, F., Kostakos, V., & Goncalves, J. (2019). Enabling Creative Crowd Work through Smart Speakers. In Proceedings of **CHI'19 Workshop** on Designing Crowd-powered Creativity Support Systems.

### Presentations and Invited Talks

- How Crowd Worker Factors Influence Subjective Annotations, AAAI HCOMP 2023, Delft, Netherlands.
- Designing and Evaluating Presentation Strategies for Fact-Checked Content, ACM CIKM 2023, Birmingham, UK.
- Invited Speaker - Quantifying and Mitigating Biases in Human Interactions with Automated Decision-Making Systems, Center for Responsible AI, New York University, 2023, New York, US.
- Panel Speaker - Can I Get a Fact-Check? News, Misinformation and Fact-Checking, ADM+S Symposium, 2023, Sydney, Australia.
- Invited Speaker - Leveraging Worker Characteristics to Mitigate Biases and Improve Data Quality in Crowdsourcing, School of Information, University of Texas at Austin, 2023, Austin, Texas, US.
- Combining Worker Factors for Heterogeneous Crowd Task Assignment, ACM Web Conference 2023, Austin, Texas, US.
- Invited Speaker - User Perception on Multi-party Fair Recommendation, Data & Research Seminar, 2022, Deezer, France (Virtual).
- Panel Speaker - Algorithmic Culture & Recommender Systems in News & Media, ADM+S Symposium, 2022, Melbourne, Australia.
- The Challenge of Variable Effort Crowdsourcing & How Visible Gold Can Help, ACM CSCW 2021 (Virtual).
- Investigating Biases in Crowdsourced Hate Speech Annotation, BHCC 2021, Delft, Netherlands (Virtual).
- Invited Speaker - The Challenge of Variable Effort Crowdsourcing & How Visible Gold Can Help, Science Tech Presentations - Amazon, Seattle, US, 2021 (Virtual).
- Task Assignment using Worker Cognitive Ability and Context to Improve Data Quality in Crowdsourcing, PhD Completion Seminar, The University of Melbourne, Australia, 2020 (Virtual).
- How Context Influences Cross-Device Task Acceptance in Crowd Work, AAAI HCOMP 2020, Hilversum, Netherlands (Virtual).
- A Cognitive Skill based System for Heterogeneous Task Assignment and Recommendation, ACM CSCW 2020 (Virtual).
- Hi! I am the Crowd Tasker, CHI Down Under 2020 (Virtual).
- Effect of Cognitive Abilities on Crowdsourcing Task Performance, Interact 2019, Paphos, Cyprus.
- Enabling Creative Crowd Work through Smart Speakers, CHI 2019 Workshop, Glasgow, UK.
- Towards Effective Crowd-Powered Online Content Moderation, OzCHI 2019, Perth, Australia.
- Improving Crowdsourced Data Quality through Effective Task Routing, PhD Confirmation Seminar, 2019, Melbourne, Australia.

## Supervision & Teaching

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### Supervision - PhD

- Kaixin Ji (2022 - ongoing, co-supervisor), RMIT University.
- Hmdh Alknjr (2022 - ongoing, co-supervisor), RMIT University.
- Hiruni Kegalle (2021 - ongoing, co-supervisor), RMIT University.

### Supervision - MSc/MIT/BSc Thesis

- Vy Le (MAI, 2023 - ongoing), Kanika Mehra (BSc Hons, 2022), RMIT University.
- Tanay Arora (MIT, 2020), Dongdong Yu (MIT, 2020), Leonardus Elbert Putra (MIT, 2019), Yue Wang (MIT, 2019), Yangyang HE (MSc, 2019), Kening Wu (MIT, 2018), The University of Melbourne.

## Examiner - PhD

- Shaoyang Fan, The University of Queensland.

## Teaching - Lecturer

- COSC 2628 - User Centred Design, RMIT University, 2023
- COSC 1182/1183 - Usability Engineering (Graduate and Undergraduate Courses), RMIT University, 2022 - 2023

## Teaching - Tutor and other roles

- COSC 2669 - Case Studies in Data Science (Graduate Course), Tutor, RMIT University, 2021
- COMP 30027 - Machine Learning, Tutor, University of Melbourne, 2020
- INFO 90007 - Social Computing (Graduate Course), Tutor, University of Melbourne, 2019
- COMP 90049 - Knowledge Technologies (Graduate Course), Tutor, University of Melbourne, 2019
- INFO 90004 - Evaluating the User Experience (Graduate Course), Teaching Support, University of Melbourne, 2019
- INFO 30004 - Usability Engineering, Teaching Support, University of Melbourne, 2019
- INFO 20004 - Usability Evaluation Methods, Teaching Support, 2018-2019
- INFO 10003 - Fundamentals of Interaction Design, Tutor, University of Melbourne, 2018
- CS 3042 - Database Systems, Visiting Instructor, University of Moratuwa, Sri Lanka, 2015
- CS 2963 - Presentation Skills, Visiting Instructor, University of Moratuwa, Sri Lanka, 2015

## Training

- Melbourne Teaching Certificate, Melbourne Centre for the Study of Higher Education, The University of Melbourne, 2019
- Teaching and Assessing Communications Skills Workshops, Melbourne School of Engineering, 2019

# Grants, Scholarships & Awards

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## Grants and Scholarships

- DAAD Ainet Fellowship in Human Centered-AI, D. Hettiachchi, DAAD - Deutscher Akademischer Austauschdienst, 2023
- ADM+S New York Fellowship, D. Hettiachchi, ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) (~15,000 AUD), 2023
- Early Career Researcher Seed Funding, D. Hettiachchi (Lead Investigator), I. Holcombe-James, A. de Silva & F. Salim, ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) (10,000 AUD), 2021
- RMIT Capital Equipment Bid to set up a new Usability Lab at School of Computing Technologies, F. Salim, D. McKay, F. Scholer, E. Naghizade, D. Hettiachchi, M. Saiedur Rahaman, L. Cavedon & F. Zambetta, RMIT University (~ 100,000 AUD), 2021
- Google Travel Scholarship, School of Computing and Information Systems, The University of Melbourne (2,500 AUD), 2019
- Melbourne School of Engineering and School of Computing and Information Systems Conference Travel Scholarship, The University of Melbourne (3,500 AUD), 2019
- Melbourne Research Scholarship, The University of Melbourne (~ 135,000 AUD), 2018 – 2021
- Mahapola Higher Education (Merit) Scholarship for Undergraduate Studies, University Grants Commission, Sri Lanka (200,000 LKR), 2011

## Awards

- Best Presentation Award, NTCIR 17, 2023
- Best Poster Award, ACM UbiComp/ISWC, 2023
- Best Poster Award, ADM+S Symposium on Automated Societies, 2022
- Best Paper, 6th Annual Doctoral Colloquium, School of Computing and Information Systems, The University of Melbourne, 2018
- Intrapreneur Award, Sysco Labs, 2017
- Runners up, Hall of Fame for Engineering Excellence, Sysco Labs, 2016
- Dean's List for Academic Excellence, Semester 1,7 and 8, Faculty of Engineering, University of Moratuwa, Sri Lanka, 2016
- Inclusive Student Leader, Unilever Youth Forum, Sri Lanka, 2015

## Competitions

- Runners Up, Spirallation Hackathon, World Conference on Youth, 2014
- 52nd globally, IEEEExtreme 7.0 programming competition, 2013
- 57th globally, Bitwise 2013 programming competition, 2013
- 93rd globally, IEEEExtreme 6.0 programming competition, 2012

# Academic Services & Leadership

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## Programme Committee Member

- Associate Chair, ACM Conference on Human Factors in Computing Systems (CHI) - 2022, 2023, 2024
- ACM International Conference on Web Search and Data Mining (WSDM) - 2022, 2023
- The ACM Web Conference (WWW) - 2022, 2023
- ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR) - 2024
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD) - Applied Science Track - 2022, 2023
- ACM International Conference on Information and Knowledge Management (CIKM) - 2021 (Short papers), 2022, 2023
- AAI Conference on Human Computation and Crowdsourcing (HCOMP) - 2020, 2023
- 4th International Workshop on Algorithmic Bias in Search and Recommendation (BIAS) - 2023
- 25th Australasian Document Computing Symposium (ADCS) - 2021
- 3rd Symposium on Biases in Human Computation and Crowdsourcing (BHCC) - 2021
- Australian Conference on Human-Computer-Interaction (OzCHI) - 2019

## Organizing and Technical Programme Committee

- Workshops and Tutorials Chair, AAI Conference on Human Computation and Crowdsourcing (HCOMP) - 2024
- Local Arrangements Chair, ACM International Conference on Mobile Human-Computer Interaction (MobileHCI) - 2024
- Student Volunteer Chair, Augmented Humans - 2024
- Website Chair, AAI Conference on Human Computation and Crowdsourcing (HCOMP) - 2022
- Sponsorship Chair, 4th Symposium on Biases in Human Computation and Crowdsourcing (BHCC) - 2022
- Organiser, ACM CHI Workshop - Reimagining Global Crowdsourcing for Better Human-AI Collaboration - 2022
- Organiser, ACM CSCW Workshop - Investigating and Mitigating Biases in Crowdsourced Data - 2021
- Logistics Chair, Australian Conference on Human-Computer-Interaction (OzCHI) - 2020
- Data Chair, ACM Conference on Human Factors in Computing Systems (CHI) - 2019
- Student Volunteer Chair, CHI DownUnder - 2020
- Student Volunteer, CHI - 2019 and OzCHI - 2018

## Conference and Journal Reviewing

- ACM Conference on Human Factors in Computing Systems (CHI) - 2020, 2021
- ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW) - 2018 to 2024
- ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) - 2019, 2020, 2021, 2023
- AAI Conference on Human Computation and Crowdsourcing (HCOMP) - 2020
- The Web Conference (WWW) - 2019
- IFIP TC.13 International Conference on Human-Computer Interaction (INTERACT) - 2019, 2021
- ACM International Conference on Information and Knowledge Management (CIKM) - 2021
- AAI Conference on Web and Social Media (ICWSM) - 2020
- Pervasive and Mobile Computing Journal (PMC) - 2020, 2021
- Information Processing & Management (IPM) - 2022
- ACM Transactions on Information Systems (TOIS) - 2022, 2023
- JCSCW: The Journal of Collaborative Computing and Work Practices - 2022
- Australian Conference on Human-Computer-Interaction (OzCHI) - 2019, 2020

## Other Leadership Roles

- Coordinator, ADM+S Tech Talks Seminar Series, 2021-22
- Committee Member 2018/19, School of Computing and Information Systems Graduate Researchers Association (CIS-GReS), The University of Melbourne.
- Vice President Public Relations 2017/18 & Sergeant at Arms 2016/17, Sysco Labs SL Toastmasters Club, Toastmasters.
- Vice President Business Development 2015/16 & Local Committee President 2014/15, AIESEC in Sri Lanka.
- President - Student Chapter 2015/16, Old Royalists Engineering Professionals Association (OREPA).