Mike Schaekermann

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OVERVIEW

My research focuses on developing methods to capture and utilize the structure of ambiguous classification problems in the context of human-centered machine learning and human-AI collaboration. My work has a special focus on medical data analysis.

EDUCATION

Doctor of Philosophy, Computer Science — 2016 - 2020
University of Waterloo, ON, Canada
Advisors: Edith Law and Kate Larson

Bachelor of Science in Engineering, Media Informatics — 2014
Salzburg University of Applied Sciences, Austria
Thesis Supervisor: Lennart Nacke

State Examination I (equivalent to BSc), Medicine — 2011
University of Marburg, Germany

WORK EXPERIENCE

Research Scientist, Google Research, Kitchener, Canada — Since 2022

Applied Scientist, Amazon Augmented AI, Toronto, Canada — 2020 - 2022

Student Researcher, Google Health, Mountain View, CA — 2018 - 2020

Research Intern, Google Brain, Mountain View, CA — 2018

Visiting Researcher, Inria Bordeaux, France — 2017

Software Engineering Intern, Google, Mountain View, CA — 2017

Head of IT & Co-Founder, Stilnest.com, Berlin, Germany — 2011 - 2015

Visiting Researcher, Ontario Tech University, ON, Canada — 2013 - 2014

Research Assistant, University Medical Center, Marburg, Germany — 2010 - 2011

AWARDS & HONOURS

Canadian Computer Science Distinguished Dissertation Award — 2021
Cheriton Distinguished Dissertation Award — UWaterloo — 2021
Harvard CRCS Postdoctoral Fellowship (declined) — 2021
Google PhD Fellowship ($68,000/year) — 2018-2020
Best Paper, ACM CSCW — 2018
Graduate Excellence Scholarship ($5,000) — UWaterloo — 2017
David R. Cheriton Graduate Scholarship ($10,000) — UWaterloo — 2016
International Doctoral Student Award ($11,760/year) — UWaterloo — 2016
Amazon Web Services Research Grant ($7,000) — Amazon — 2016
Merit-based Scholarship — Salzburg University of Applied Sciences — 2014
Engineering Scholarship — Economic Chamber of Salzburg — 2013
Nominee for the German National Academic Foundation — 2009

PUBLICATIONS

Peer-Reviewed Conference Proceedings

[C.1] Hettiachchi, D., Schaekermann, M., McKinney, T., & Lease, M. **The Challenge of Variable Effort Crowdsourcing and How Visible Gold Can Help. CSCW'21**. Held Virtually.

[C.2] Schaekermann, M., Beaton, G., Sanoubari, E., Lim, A., Larson, K., & Law, E. **Ambiguity-aware AI Assistants for Medical Data Analysis. CHI'20**. Honolulu, HI.

[C.3] Schaekermann, M., Cai, C. J., Huang, A. E., & Sayres, R. **Expert Discussions Improve Comprehension of Difficult Cases in Medical Image Assessment. CHI'20**. Honolulu, HI.

[C.4] Schaekermann, M., Beaton, G., Habib, M., Lim, A., Larson, K., & Law, E. **Understanding Expert Disagreement in Medical Data Analysis through Structured Adjudication. CSCW'19**. Austin, TX.

[C.5] Cohen, R., Schaekermann, M., Liu, S., & Cormier, M. **Trusted AI and the Contribution of Trust Modeling in Multiagent Systems. AAMAS'19**. Montréal, Canada.

[C.6] Schaekermann, M., Goh, J., Larson, K., & Law, E. **Resolvable vs. Irresolvable Disagreement: A Study on Worker Deliberation in Crowd Work. CSCW'18**. New York City, NY. **Best Paper Award**

[C.7] Schaekermann, M., Ribeiro, G., Wallner, G., Kriglstein, S., Johnson, D., Drachen, A., & Nacke, L. E. **Curiously Motivated: Profiling Curiosity with Self-Reports and Behaviour Metrics in the Game "Destiny". CHI PLAY'17**. Amsterdam, Netherlands.

[C.8] Jaini, P., Chen, Z., Carbajal, P., Law, E., Middleton, L., Regan, K., Schaekermann, M., Trimponias, G., Tung, J., & Poupart, P. **Online Bayesian Transfer Learning for Sequential Data Modeling. ICLR'17**. Toulon, France.

[C.9] Wehbe, R. R., Mekler, E. D., Schaekermann, M., Lank, E., & Nacke, L. E. **Testing Incremental Difficulty Design in Platformer Games. CHI'17**. Denver, CO.

Peer-Reviewed Journal Publications

[J.1] Limwattanayingyong, J., Nganthavee, V., Seresirikachorn, K., Singalavanija, T., Soonthornworasiri, N., Ruamviboonsuk, V., Rao, C., Raman, R., Grzybowski, A., Schaekermann, M., Peng, L. H., Webster, D. R., Semturs, C., Krause, J., Sayres, R., Hersch, F., Tiwari, R., Liu, Y, & Ruamviboonsuk, P. **Longitudinal Screening for Diabetic Retinopathy in a Nationwide Screening Program: Comparing Deep Learning and Human Graders.** In **Journal of Diabetes Research**. 2020.

[J.2] Sokolov, E., Abdoul Bachir, D. H., Sakadi, F., Williams, J., Vogel, A. C., Schaekermann, M., Tassiou, N., Bah, A. K., Khatri, V., Hotan, G. C., Ayub, N., Leung, E., Fantaneanu, T. A., Patel, A., Vyas, M., Milligan, T., Villamar, M. F., Hoch, D., Purves, S., Esmaeili, B., Stanley, M., LehnSchioler, T., TellezZenteno, J., GonzalezGiraldo, E., Tolokh, I., Heidarian, L., Worden, L., Jadeja, N., Fridinger, S., Lee, L., Law, E., Fod Abass, C., & Mateen, F. J. **Tablet-based electroencephalography diagnostics for patients with epilepsy in the West African Republic of Guinea.** In **European Journal of Neurology**. 2020.

[J.3] Schaekermann, M., Hammel, N., Terry, M., Ali, T. K., Liu, Y., Basham, B., Campana, B., Chen, W., Ji, X., Krause, J., Corrado, G. S., Peng, L., Webster, D. R., Law, E., & Sayres, R. **Remote Tool-Based Adjudication for Grading Diabetic Retinopathy.** In **Translational Vision Science & Technology**. 2019.

[J.4] Williams, J., Cisse, F.A., Schaekermann, M., Sakadi, F., Tassiou, N.R., Hotan, G., Bah, A.K., Hamani, A.B.D., Lim, A., Leung, E.C.W., Fantaneanu, T.A., Milligan, T., Khatri, V., Hoch, D., Vyas, M., Lam, A., Cohen, J., Vogel, A., Law, E., & Mateen, F. **Smartphone EEG and remote online interpretation for children with epilepsy in the Republic of Guinea: Quality, characteristics, and practice implications.** In **Seizure**. 2019.

[J.5] Phene, S. and Dunn, C. and Hammel, N. and Liu, Y. and Krause, J. and Kitade, N. and Schaekermann, M. and Sayres, R. and Wu, D. and Bora, A. and Semturs, C. and Misra, A. and Huang, A. and Spitze, A. and Medeiros, F. and Maa, A. and Gandhi, M. and Corrado, G. and Peng, L., & Webster, D. **Deep Learning and Glaucoma Specialists: The Relative Importance of Optic Disc Features to Predict Glaucoma Referral in Fundus Photographs.** In **Ophthalmology**. 2019.

Peer-Reviewed Workshop Papers and Abstracts

[P.1] Schaekermann, M., Beaton, G., Habib, M., Lim, A., Larson, K., & Law, E. **crowdEEG: A Platform for Structured Consensus Formation in Medical Time Series Analysis.** 8th Workshop on Interactive Systems in Healthcare (WISH) at **CHI'19**. Glasgow, UK.

[P.2] Schaekermann, M., Beaton, G., Habib, M., Lim, A., Larson, K., & Law, E. **Capturing Expert Arguments from Medical Adjudication Discussions in a Machine-readable Format.** 2nd Workshop on Subjectivity, Ambiguity and Disagreement in Crowdsourcing at **WebConf'19**. San Francisco, CA.

[P.3] Williams, J., Cisse, F.A., Schaekermann, M., Sakadi, F., Tassiou, N.R., Bah, A.K., Hamani, A.B.D., Lim, A., Leung, E.C.W., Fantaneau, T.A., Milligan, T., Khatri, V., Hoch, D., Vyas, M., Lam, A., Hotan, G., Cohen, J., Law, E., & Mateen, F. **Utilizing a wearable smartphone-based EEG for pediatric epilepsy patients in the resource poor environment of Guinea: A prospective study.** Annual Meeting of the American Academy of Neurology **AAN'19**. Philadelphia, PA.

[P.4] Schaekermann, M., Lim, A., Larson, K., & Law, E. **Expert Disagreement in Sequential Labeling: A Case Study on Adjudication in Medical Time Series Analysis.** 1st Workshop on Subjectivity, Ambiguity and Disagreement (SAD) in Crowdsourcing at **HCOMP'18**. Zurich, Switzerland.

[P.5] Schaekermann, M., Law, E., Williams, A. C., & Callaghan, W. **Resolvable vs. Irresolvable Ambiguity: A New Hybrid Framework for Dealing with Uncertain Ground Truth.** 1st Workshop on Human-Centered Machine Learning at **CHI'16**. San Jose, CA.

Theses

[T.1] Schaekermann, M. **Human-AI Interaction in the Presence of Ambiguity: From Deliberation-based Labeling to Ambiguity-aware AI**
Ph.D. Thesis. 2014.

[T.2] Schaekermann, M. **Implementation of a Collaborative Web Application for Annotating Gameplay Videos Based on Biometric Player Data** *Bachelor's Thesis*. 2014.

Invited Articles

[I.1] Aroyo, L., Lease, M., Paritosh, P., & Schaekermann, M. **Data Excellence for AI: Why Should You Care?** In **ACM Interactions**, 29(2) March-April, 2022.

[I.2] Schaekermann, M., Homan, C. M., Aroyo, L., Paritosh, P., Bollacker, K., & Welty, C. **AI Bookie: Will Machine Learning Outgrow Human Labeling?** In **AI Magazine**. 2020.

FUNDING

Waterloo Citizen Science Laboratory 2016
Prepared a grant application with Edith Law and Alex Williams to provide infrastructure for scientific crowdsourcing studies. $144,703 awarded through the Canadian Foundation for Innovation (CFI).

Amazon Web Services Research Grant 2016
Prepared a grant application with Alex Williams to secure funding for computing resources to support various crowdsourcing studies and online hybrid human-AI systems. $7,000 awarded in credits through Amazon Web Services (AWS).

PROGRAM DEVELOPMENT

Joint Master's Program in Human-Computer Interaction (HCI) 2019
University of Salzburg & Salzburg University of Applied Sciences
Contributed to the design and accreditation of a new Human-Computer Interaction (HCI) master's degree program in the role of student alumnus.

INVITED TALKS

Apple, Seattle 2020
"Human-AI Interaction in the Presence of Ambiguity"

Google PhD Fellowship Summit, Mountain View 2019
"Deliberative Analysis of Ambiguous Cases in Human & Machine Learning"

NeuroTechX, Toronto 2016
"CrowdEEG: Collaborative Annotation Platform for Clinical EEG Recordings"

TEACHING

Interactive Machine Learning (CMPUT656), Guest Lecturer Fall 2020
Course instructor: Matthew E. Taylor
University of Alberta, AB, Canada

Human-Computer Interaction (CS449), Teaching Assistant Winter 2018
University of Waterloo, ON, Canada

Introduction to Artificial Intelligence (CS486), Teaching Assistant Fall 2017
University of Waterloo, ON, Canada

Graduate Research Skills Seminar (CS697), Guest Lecturer Fall 2017
University of Waterloo, ON, Canada

Introduction to Computer Science II (CS116), Teaching Assistant Spring 2017
University of Waterloo, ON, Canada

Introduction to Artificial Intelligence (CS486), Teaching Assistant — Fall 2016
University of Waterloo, ON, Canada

Applied Mathematics, Tutorial Class Instructor — 2012-2013
Salzburg University of Applied Sciences, Austria

CONFERENCE WORKSHOPS ORGANIZED

Biases in Crowdsourced Data. Co-chaired with Danula Hettiachchi, Mark Sanderson, Jorge Goncalves, Simo Hosio, Gabriella Kazai, & Matt Lease at **CSCW'21**.

Data Excellence Workshop (DEW 2020). Co-chaired with Lora Aroyo, Praveen Paritosh, & Matt Lease at **HCOMP'20**.

Subjectivity, Ambiguity and Disagreement (SAD) in Crowdsourcing (SAD 2019). Co-chaired with Chris Welty, Lora Aroyo, Praveen Paritosh, Anca Dumitrache, Jennimaria Palomaki, Alex Quinn, Olivia Rheinhart, & Michael Tseng at **WebConf'19**.

Designing for Curiosity: an Interdisciplinary Workshop. Co-organized with Edith Law, Pierre-Yves Oudeyer, Ming Yin, & Alex Williams at **CHI'17**.

SERVICE & LEADERSHIP

Associate Chair: "Computational Interaction" at ACM CHI (2021, 2022), Applied Research Track at ACM CIKM (2020, 2021)
Session Chair: "Designing Decision Support" at ACM CHI (2019)
Journal Reviewer: International Journal of Human-Computer Studies (2021), ACM Transactions on Interactive Intelligent Systems (2017)
Conference Reviewer: ACM CHI (2017-2022), ACM CSCW (2018-2022), ACM UIST (2020), ACM DIS (2020), ACM CHI PLAY (2016)
Workshop Reviewer: Data-Centric AI (NeurIPS'21), ML4Data (ICML'21), HumBL (CSCW'19), CrowdBias (CSCW'18)

REFERENCES

Edith Law, PhD co-supervisor
Associate Professor, Computer Science, University of Waterloo
Email: edith.law@uwaterloo.ca

Kate Larson, PhD co-supervisor
Professor, Computer Science, University of Waterloo
Research Scientist, DeepMind
Email: kate.larson@uwaterloo.ca

Rory Sayres, Internship Mentor
Staff Researcher, Google Health Research & Innovations, Google
Email: sayres@google.com

Michael Terry, Fellowship Mentor
Staff Software Engineer, People+AI Research, Google
Previously *Associate Professor*, Computer Science, University of Waterloo
Email: michaelterry@google.com

Matthew Lease, Mentor
Associate Professor, Computer Science, University of Texas at Austin
Amazon Scholar, Human-in-the-Loop Research, Amazon Science
Email: ml@utexas.edu