Dr. Sambit Praharaj

POSTDOC ON EDTECH AND AI
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"The greatest danger for most of us is not that our aim is too high and we miss it but that it is too low and we reach it." — Michelangelo

Research Experience

Center for Advanced Internet Studies and Ruhr University Bochum   *Bochum, Germany*

Postdoctoral Researcher on Educational Technologies and AI   *June 2022 - May 2024*

- Detect the quality of collaboration during group work
- Build predictive models to predict the quality of collaboration from group speech data
- Build real-time adaptive feedback to facilitate the collaboration
- Use mutimodal learning analytics, collaboration analytics and artificial intelligence
- Got invited for a research visit to present my research ideas in the Computer Science department of Laval University, France

Delft University of Technology   *Delft, Netherlands*

Visiting researcher as part of PhD research   *Oct 2019 - June 2020*

- Collaborated on a project in the context of collaborative learning in knowledge building with researchers from Delft University and National Institute of Education from NTU Singapore

SafePAT Project   *Netherlands, Germany, Belgium*

Project researcher: Contributed to the project as part of PhD research   *May 2018 - Oct 2019*

- Improve the (cross-border) Group Handover Training during change of shifts by using sensors and feedback (otherwise known as "Multimodal Learning Analytics during Medical Simulation and Training")

Complex Networking Group, IIT Kharagpur   *Kharagpur, India*

Research Internship during B.Tech   *May 2014 - June 2014*

- Performed research on the project titled as: "Measuring Similarity in Undirected, Unweighted Graphs"
- Simplified complex social and telecom networks which evolve with time by designing a combined similarity measure

Education

Open University of The Netherlands   *Heerlen, Netherlands*

PhD on EdTech and AI (Collaboration Analytics with Multimodal Learning Analytics and AI)   *September 2017 - February 2022*

- PhD dissertation on "Measuring the Unmeasurable? Towards Automatic Co-located Collaboration Analytics"
- Successfully defended and graduated on 11th March 2022
- Worked with Multimodal Learning Analytics in Co-located Collaboration using sensors to detect different indicators of collaboration quality during a co-located collaboration task and did automatic collaboration analytics
- Collaborated with DIPF Leibniz Institute for Research and Information in Education Frankfurt, Zuyd University and Center of Education and Learning (CEL), Delft University
- Got a full scholarship to present my PhD research in the doctoral consortium in ICMI conference in China

Delft University of Technology (Grade: 7.38/10)   *Delft, Netherlands*

Msc. in Computer Science   *September 2015 - August 2017*

- Master's thesis on "Data Analytics in Web-based Education in the Higher-education Classroom"
- Collaborated with Lambda lab in WIS research group at TU Delft and researchers from Lugano, Switzerland for my thesis
- Set up an experiment and analyzed the data gathered from the lecture interaction event logs of around 300 students in each lecture in a Bachelor's classroom to determine the attention level of students with a goal to improve the state-of-the-art classroom teaching

VSSUT Burla (Grade: 8.74/10)   *Odisha, India*

Bachelor of Technology in Information Technology   *2011-2015*

- Major Project: Energy Efficient Routing in Wireless Sensor Networks

Ispat English Medium School Rourkela (Grade: 86.33/100)   *Odisha, India*

ISC Science   *2011*

- Physics, Chemistry, Mathematics, English and Computer Applications

Ispat English Medium School Rourkela (Grade: 95.43/100)   *Odisha, India*

ICSE   *2009*

- Received 3rd rank in the class

Research Interests

EdTech, Artificial Intelligence in Education, Multimodal Learning Analytics, Data Science, Computer Science

- Collaboration Analytics, Multimodal Learning Analytics, Learning Analytics, Technology Enhanced Learning, Natural Language Processing, Educational Data Science, Collaborative Learning, Educational Technology, Artificial Intelligence in Education, Learning Technology and Human Computer Interaction

Publications

Unobtrusive Observations of Learning in Digital Environments, Springer
Book Chapter

S. Praharaj, M. Scheffel, M.Specht, H. Drachsler. *Measuring Collaboration Quality through Audio Data and Learning Analytics*
June 2023

- This chapter addressed the collaboration quality detection and measurement
- Defined collaboration quality using audio data and unobtrusive learning analytics measures
- Explained the design of a sensor-based set up for automatic collaboration analytics
- Moved towards quantifying the quality of collaboration by using this set up and showed the analysis using meaningful visualizations
- Addressed the challenges and issues at hand and how solutions can be built upon the work already done
- In short this book chapter summarized my PhD thesis in only 20 pages!
- DOI: `https://link.springer.com/chapter/10.1007/978-3-031-30992-2_6`

Learning Analytics and Knowledge (LAK 22) ACM (Rank: CORE A)
California, USA (Online)

S. Praharaj, M. Scheffel, M. Schmitz, M.Specht, H. Drachsler. *Towards Collaborative Convergence: Quantifying Collaboration Quality with Automated Co-located Collaboration Analytics*
March 2022

- Designed a dashboard to analyze the quality of collaboration automatically
- DOI: `https://doi.org/10.1145/3506860.3506922`

PhD Thesis
Open University of The Netherlands

S. Praharaj. *Measuring the Unmeasurable? Towards Automatic Co-located Collaboration Analytics*
March 2022

- Defined the indicators of face-to-face collaboration quality
- Designed and developed a sensor-based set up for automatic collaboration analytics
- Moved towards quantifying the quality of collaboration by using collaboration analytics set up and showed the visualizations on a dashboard
- DOI: `https://bit.ly/SambitPhDThesisBook1`

IEEE Transactions on Learning Technologies (5 Year Impact Factor: 4.255)
Journal

S. Praharaj, M. Scheffel, H. Drachsler, M.Specht. *Literature Review on Co-Located Collaboration Modeling Using Multimodal Learning Analytics—Can We Go the Whole Nine Yards?*
July 2021

- Did a Literature Review to detect indicators of collaboration quality, model them in different collaboration scenarios
- DOI: `https://doi.org/10.1109/TLT.2021.3097766`

MDPI Sensors (5 Year Impact Factor: 4.1)
Journal

S. Praharaj, M. Scheffel, M. Schmitz, M. Specht, H. Drachsler. *Towards Automatic Collaboration Analytics for Group Speech Data Using Learning Analytics*
May 2021

- Developed a prototype to do automatic collaboration analytics in a co-located collaboration task
- DOI: `https://doi.org/10.3390/s21093156`

International Conference on Learning Sciences (ICLS 20) ISLS
Nashville, USA

H. Chen, E. Tan, Y. Lee, S. Praharaj, M. Specht and G. Zhao. *Developing AI into Explanatory Supporting Models: An Explanation-visualized Deep Learning Prototype for Computer Supported Collaborative Learning*
June 2020

- Assisted in the project with Center of Education and Learning, TU Delft and published this conference article
- DOI: `https://repository.isls.org/bitstream/1/6305/1/1133-1140.pdf`

Learning Analytics and Knowledge (LAK 22) ACM (Rank: CORE A)
Frankfurt, Germany (Online)

Y. Lee, H. Chen, E. Tan, S. Praharaj and M. Specht. *FLOWer: Feedback Loop for Group Work Supporter*
March 2020

- Assisted in the project with Center of Education and Learning, TU Delft and published this demo in the conference
- DOI: `https://www.solaresearch.org/wp-content/uploads/2020/06/LAK20_Companion_Proceedings.pdf#page=211`

International Conference on Multimodal Interaction (ICMI 19) ACM (Rank: CORE B)
Suzhou, China

S. Praharaj. *Co-located Collaboration Analytics*
October 2019

- Presented in PhD doctoral consortium with a full scholarship of around 900 Euros
- DOI: `https://doi.org/10.1145/3340555.3356087`

European Conference on Technology Enhanced Learning (EC-TEL 19) Springer LNCS (Rank: CORE B)

Delft, Netherlands

S. Praharaj, M. Scheffel, H. Drachsler and M. Specht. Group Coach for Co-located Collaboration

September 2019

- Showed a demo for the developed tool to give real-time feedback during co-located collaboration
- DOI: `https://doi.org/10.1007/978-3-030-29736-7_77`

Computer Supported Collaborative Learning (CSCL 19) (Rank: CORE B)

Lyon, France

C. L. Teo, E. Koh, M. Scardamalia, J. Zhang, M. Chen, C. Chan, S. Praharaj, E. Tan and A. Ong. Understanding New Assessment and Environment for Knowledge Building: Triangulating Features of Discourse Platform, Multimodal Learning Analytics and Text-based Learning Analytics

June 2019

- Co-organized a workshop and published a article in the conference
- Did a live demo about my PhD research in the workshop
- DOI: `https://core.ac.uk/download/pdf/390063533.pdf#page=530`

EC-TEL 2018 CEUR (Rank: CORE B)

Leeds, UK

S. Praharaj, M. Scheffel, H. Drachsler and M. Specht. MULTIFOCUS: MULTImodal Learning Analytics FOr Co-located Collaboration Understanding and Support

September 2018

- Wrote PhD research proposal for the doctoral consortium
- DOI: `https://ceur-ws.org/Vol-2294/DCECTEL2018_paper_14.pdf`

EC-TEL 2018 Springer LNCS (Track: Innovative Learning Infrastructure) (Rank: CORE B)

Leeds, UK

S. Praharaj, M. Scheffel, H. Drachsler and M. Specht. Multimodal Analytics for Real-time Feedback in Co-located Collaboration

September 2018

- Did a State-of-the-art-survey to detect indicators of collaboration quality and feedback and designed a pilot study to give real-time feedback during PhD meetings
- DOI: `https://doi.org/10.1007/978-3-319-98572-5_15`

Master Thesis

TU Delft

S. Praharaj. Data Analytics in Web-based Education in the Higher-education Classroom

August 2017

- Set up an experiment and analyzed the data gathered from the lecture interaction event logs of around 300 students in each lecture in a Bachelor's classroom to determine the attention level of students with a goal to improve the state-of-the-art classroom teaching
- DOI: `https://repository.tudelft.nl/islandora/object/uuid:e55389c3-3966-40f5-bf83-a8f9c6c393f0`

User Modeling, Adaptation and Personalization (UMAP 17) ACM (Track: Technology Enhanced Adaptive Learning) (Rank: CORE B)

Bratislava, Slovakia

V. Triglianos, S. Praharaj, C. Pautasso, A. Bozzon and C. Hauff. Measuring Student Behaviour Dynamics in a Large Interactive Classroom Setting

July 2017

- Analyzed the log data captured during all the 15 lectures for the paper to detect student attention profiles in the classroom which is also a part of my master thesis
- DOI: `https://doi.org/10.1145/3079628.3079671`

DESOSA (Delft Students on Software Architecture)

Book Chapter

Book Chapter on Ember: A framework for creating ambitious web applications

May 2016

- Worked to communicate with the developers on Github, Slack and refactored part of the code on Github, contributed for the chapter
- DOI: `https://delftswa.gitbooks.io/desosa2016/content/ember.js/chapter.html`

Supervision and Teaching

Master Thesis students and course

Co-supervised and assisted in course implementation

- Co-supervised 2 Master thesis students in the Open University of the Netherlands during PhD
- Assisted with implementing a new course in the Open University digital learning environment (yOUlearn)

Workshops, Research Visits and Talks

Invited research lecture

Essen, Germany

Got invited to give a talk on my current research as part of Interdisciplinary Lecture Series for Educational Research in University of Duisburg-Essen

May 2023

- Topic of Lecture: Am I collaborating well? What does automatic collaboration analytics reveal about the quality of collaboration?
- Got a honorarium of 250 Euros to give the talk

Invited guest speaker in the podcast   *Online*

Got invited as a guest speaker to speak in the podcast on the opportunities and challenges in the field of   *April 2023*
Multimodal Learning Analytics along with a Associate Professor from University College London, UK

- Episode 19 on this Website: `https://www.solaresearch.org/community/podcast/`

Invited research visit   *Laval, France*

Got invited for a research visit to present my research ideas in the Computer Science department of Laval   *July 2022*
University, France

- Topic of Talk: Am I collaborating well?
- Website: `https://lium.univ-lemans.fr/en/am-i-collaborating-well/`

Co-organized a workshop in CSCL Conference with teams from NIE Singapore,   *Lyon, France*
Canada and USA

Did a live demo in the workshop on Multimodal Learning Analytics in Knowledge Building   *June 2019*

Organized 2 workshops during Joint Technology Enhanced Learning Summer   *Bari, Italy*
School

One workshop related to my PhD and other was related to balancing PhD life with supervisor   *June 2019*

Creator of Educational YouTube Channel: SambitPhD (16K+ Subscribers)   *YouTube*

Vlog my experiences on studying, living in Netherlands, Germany and Europe and mentor professionals for   *October 2018 - Present*
study and work abroad

- Share my PhD experiences, conference experiences, study and living experience in Netherlands, Germany and Europe to help students and professionals, mentor them to study abroad
- Channel: `https://www.youtube.com/@SambitPhD`

Review
Editor of conference, reviewer of conferences and journals

- Co-editor of EC-TEL Conference Practitioner Track Proceedings, 2018
- Reviewed for Human Factors in Computing Systems (CHI), Artificial Intelligence in Education (AIED), European Conference on Technology-Enhanced Learning (EC-TEL), Learning Analytics and Knowledge (LAK), International Conference on Multimodal Interaction (ICMI) and Computer Supported Collaborative Learning (CSCL) conferences
- Reviewed for British Journal of Educational Technology (BJET), Journal of Computer Assisted Learning (JCAL), IEEE Transactions in Learning Technologies (IEEE TLT), Journal of Learning Analytics (JLA), Education Technology Research and Development (ETRD) and Research Learning and Research Practice (RLRP) journals

Referees
List of referees

- Prof. Dr. Hendrik Drachsler (x@dipf.de)
- Prof. Dr. Marcus Specht (y@tudelft.nl)
- Prof. Dr. Maren Scheffel (z@rub.de)

Address
Present and Permanent Address

- Present address: xx, Germany
- Permanent address: yy, India