Jun.-Prof. Dr.-Ing. Shoya Ishimaru

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Summary

Shoya Ishimaru is a Junior Professor in Computer Science at the University of Kaiserslautern and the director of Psybernetics Lab, an interdisciplinary research group investigating Human-Computer Interaction, Machine Learning, and Cognitive Psychology toward amplifying human intelligence. He has co-founded Immersive Quantified Learning Lab and Alphaben in order to distribute practical applications using his research results. Shoya received his Bachelor's and Master's degree in Engineering from Osaka Prefecture University in 2014 and 2016, respectively. He received his PhD in Engineering with an award *summa cum laude* from the University of Kaiserslautern in 2019. He has also received the title of MITOU Super Creator, which is given to outstanding young developers (around 10 people per year) by the Ministry of Economy, Trade, and Industry in Japan.

Background

Human-Computer Interaction, Learning Analytics, Wearable Computing, and Pattern Recognition

Academic Work Experience

Junior Professor, University of Kaiserslautern *2021 – current*

Visiting Researcher, Osaka Prefecture University *2016 – current*

Researcher, Keio Media Design Research Institute *2014 – current*

Research Associate, University of Kaiserslautern *2016 – 2019*

Industrial Work Experience

Co-Founder Chief Research Officer (CRO), Alphaben *2021 – current*

Senior Researcher, German Research Center for Artificial Intelligence (DFKI) *2019 – current*

Researcher, German Research Center for Artificial Intelligence (DFKI) *2016 – 2019*

Internship, Part-Time Job, and Service

Mentor (PM), Mitou Junior *2020 – current*

Engineering Mentor, Life is Tech, Inc. *2013 – 2015*

Engineering Internship, Recruit Holdings Co. *2015*

Engineering Internship, Livesense Inc. *2014*

Engineering Internship, Cookpad Inc. *2014*

Software Engineer, Campus. Inc. *2012 – 2013*

Part-Time Software Engineer, Paperboy&co. Inc *2012*

Engineering Internship, Hatena Co. *2012*

Education

PhD in Engineering, University of Kaiserslautern, Germany *2016 – 2019*

Meta-Augmented Human: From Physical to Cognitive Towards Affective State Recognition
Reviewed by Prof. Andreas Dengel, Prof. Paul Lukowicz, and Prof. Koichi Kise

Master of Engineering, Graduate School of Engineering, Osaka Prefecture University, Japan *2014 – 2016*

Eyewear Computing for Cognitive Activity Recognition
Reviewed by Prof. Koichi Kise, Prof. Tomoharu Nakashima, and Prof. Hisao Ishibuchi

Bachelor of Engineering, Osaka Prefecture University, Japan *2010 – 2014*

Activity Recognition with Google Glass: Combining Head Motion and Eye Blink Frequency
Reviewed by Prof. Koichi Kise and Prof. Kai Kunze

Acquired Grants as PI

JSPS Grant-in-Aid for Young Scientists (B), 31 K EUR (4.16 M JPY) *FY 2017 – 2019*
Eyetifact: Platform for Eyewear Data Conversion and Its Application to Activity Recognition in the Wild

IPA MITOU Exploratory IT Human Resources Project, 18 K EUR (2.30 M JPY) *FY 2015*
Shin' on kei: Development of a System for Visualizing the Mental State

Acquired Grants as Co-PI

DFG ANR JST International Call on Artificial Intelligence, 757 K EUR (93 M JPY) *2020 – 2022*
Learning Cyclotron

JSPS Fostering Joint International Research (B), 142 K EUR (18.82 M JPY) *FY 2020 – 2022*
International Collaborative Research on Intelligence Augmentation for Human Learning

JSPS Grant-in-Aid for Scientific Research (B), 142 K EUR (17.81 M JPY) *FY 2020 – 2022*
Sensing and Actuation to Accelerate Human Knowledge I/O

JSPS Grant-in-Aid for Scientific Research (C), 37 K EUR (4.68 M JPY) *FY 2017 – 2019*
Generating Artificial Eye Movements on a Document for an Objective Readability Measurement

Teaching

Collaborative Intelligence, University of Kaiserslautern (Co-lecturing with Prof. Dengel) *SS 2021 - 2019*

Completed Supervision

8 Master Theses	*Hussain, Jacob, Brishtel, Santhosh, Holub, Baitemirov, Steinert, Sinha*
1 Bachelor Thesis	*Steinert*
9 Project/Seminar Students	*Roy, Herurkar, Liu, Ghosh, Gomez, Inal, Allison, Kumar, Garg*
4 Internship Students	*Yamanda, Ohbayashi, Watanabe, Maruichi*

Conference Organization

Program Committee for Augmented Humans 2021 *2021*
Program Co-Chair for Augmented Humans 2020 *2020*
Co-Organizer for EyeWild 2019 (UbiComp Satellite Tutorial) *2019*
Program Committee for PerPersuasion 2019 (PerCom Satellite Workshop) *2019*
Program Committee for READ 2018 *2018*
Co-Organizer for Application Developer Festival 2015 *2015*
Reviewer for ACM IMWUT, IEEE Access, IJDAR, MDPI Mathematics, IPSJ, CHI '22 '21 '20, IUI '21, AHs '21, ISWC '20, MobileHCI '20, PerCom-PerPersuasion '19, READ '18, ICDAR-HDI '17

Selected Awards and Honorable Activities

Best Presentation Award at Asian CHI Symposium 2020 *2020*
PhD with an award *summa cum laude* (with highest praise) *2019*
Poster Track Honorable Mention at UbiComp/ISWC 2018 *2018*
Gave an invited talk "Cognitive Cyborgs" at TEDxNagouaU *2017*
Certificated as MITOU Super Creator by Ministry of Economy, Trade, and Industry in Japan *2016*
President's Honor in Osaka Prefecture University, Japan *2012, 2015*

References

Prof. Dr. Prof. h.c. Andreas Dengel *Executive Director, DFKI. Andreas.Dengel@dfki.de*
Prof. Dr. Koichi Kise *Professor, Osaka Prefecture University. kise@cs.osakafu-u.ac.jp*

Journal Papers

1. Ko Watanabe, Yusuke Soneda, Yuki Matsuda, Yugo Nakamura, Yutaka Arakawa, Andreas Dengel and Shoya Ishimaru. "DisCaaS: Micro Behavior Analysis on Discussion by Camera as a Sensor". Sensors 21 (17), p. 5719, 2021..

2. Iuliia Brishtel, Anam Ahmad Khan, Thomas Schmidt, Tilman Dingler, Shoya Ishimaru and Andreas Dengel. "Mind Wandering in Multimodal Reading Setting: Behavior Analysis & Automatic Detection using Eye-Tracking and EDA Sensor". Sensors, 20 (9), p. 2546, 2020.

3. Oliver Amft, Florian Wahl, Shoya Ishimaru and Kai Kunze. "Making Regular Eyeglasses Smart". IEEE Pervasive Computing, 14 (3), pp. 32–43, 2015.

Book Chapter

1. Shoya Ishimaru, Syed Saqib Bukhari, Carina Heisel, Nicolas Großmann, Pascal Klein, Jochen Kuhn and Andreas Dengel. "Augmented Learning on Anticipating Textbooks with Eye Tracking". Positive Learning in the Age of Information (PLATO), pp. 387–398, 2018.

Conference Papers

1. David Dzsotjan, Kim Ludwig-Petsch, Sergey Mukhametov, Shoya Ishimaru, Stefan Küchemann and Jochen Kuhn. "The Predictive Power of Eye-Tracking Data in an Interactive AR Learning Environment". In Proceedings of the 2021 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '21 Adjunct), pp. 467-471, 2021.

2. Pramod Vadiraja, Jayasankar Santhosh, Hanane Moulay, Andreas Dengel and Shoya Ishimaru. "Effects of Counting Seconds in the Mind while Reading". In Proceedings of the 2021 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '21 Adjunct), pp. 486-490, 2021.

3. Prerna Garg, Jayasankar Santhosh, Andreas Dengel and Shoya Ishimaru. "Stress Detection by Machine Learning and Wearable Sensors". In Proceedings of the 26th International Conference on Intelligent User Interfaces Companion (IUI '21), pp. 237–240, 2021.

4. Pramod Vadiraja, Andreas Dengel and Shoya Ishimaru. "Text Summary Augmentation for Intelligent Reading Assistant". In Proceedings of the 2nd Augmented Humans International Conference (AHs '21), pp. 319–321, 2021.

5. Shoya Ishimaru, Takanori Maruichi, Koichi Kise and Andreas Dengel. "Gaze-Based Self-Confidence Estimation on Multiple-Choice Questions and Its Feedback". In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (Asian CHI Symposium '20), 2020. *Best Presentation Award*

6. Jayasankar Santhosh, Shoya Ishimaru and Andreas Dengel. "Generating Heatmap for Unknown Documents Towards Readability Measurement". In Proceedings of the 25th International Conference on Intelligent User Interfaces Companion (IUI '20), pp. 47–48, 2020.

7. Takanori Maruichi, Shoya Ishimaru and Koichi Kise. "Self-confidence Estimation on Vocabulary Tests with Stroke-level Handwriting Logs". In Proceedings of the 15th IAPR International Conference on Document Analysis and Recognition (ICDAR HDI '19), pp. 18–22, 2019.

8. Shoya Ishimaru, Takanori Maruichi, Manuel Landsmann, Koichi Kise and Andreas Dengel. "Electrooculography Dataset for Reading Detection in the Wild". In Proceedings of the 2019 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '19 Adjunct), pp. 85–88, 2019.

9. Shoya Ishimaru, Ko Watanabe, Nicolas Großmann, Carina Heisel, Pascal Klein, Yutaka Arakawa, Jochen Kuhn and Andreas Dengel. "HyperMind Builder: Pervasive User Interface to Create Intelligent Interactive Documents". In Proceedings of the 2018 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '18 Adjunct), pp. 357–360, 2018.

10. Soumy Jacob, Shoya Ishimaru and Andreas Dengel. "Interest Detection While Reading Newspaper Articles by Utilizing a Physiological Sensing Wristband". In Proceedings of the 2018 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '18 Adjunct), pp. 78–81, 2018. *Poster Track Honorable Mention*

11. Dayananda Herurkar, Shoya Ishimaru and Andreas Dengel. "Combining Software-Based Eye Tracking and a Wide-Angle Lens for Sneaking Detection". In Proceedings of the 2018 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '18 Adjunct), pp. 54–57, 2018.

12. Yuya Ohbayashi, Shoya Ishimaru, Andreas Dengel and Koichi Kise. "Investigating Gaze and Physiological Features to Estimate Comprehension on E-learning Video Lectures". In Proceedings of the 1st international interdisciplinary Symposium on Reading Experience and Analysis of Documents (READ '18), 2018.

13. Jayasankar Santhosh, Shoya Ishimaru and Andreas Dengel. "Estimating Fixation Durations for Each Word in Documents towards Readability Measurement". In Proceedings of the 1st international interdisciplinary Symposium on Reading Experience and Analysis of Documents (READ '18), 2018.

14. Nicolas Großmann, Iuliia Brishtel, Shoya Ishimaru, Andreas Dengel, Carina Heisel, Pascal Klein and Jochen Kuhn. "iQL - Immersive Quantified Learning Lab". In Proceedings of the 1st international interdisciplinary Symposium on Reading Experience and Analysis of Documents (READ '18), 2018.

15. Soumy Jacob, Shoya Ishimaru, Syed Saqib Bukhari and Andreas Dengel. "Gaze-Based Interest Detection on Newspaper Articles". In Proceedings of the 7th Workshop on Pervasive Eye Tracking and Mobile Eye-Based Interaction (ETRA '18), p. 4, 2018.

16. Iuliia Brishtel, Shoya Ishimaru, Olivier Augereau, Koichi Kise and Andreas Dengel. "Assessing Cognitive Workload on Printed and Electronic Media using Eye-Tracker and EDA Wristband". In Proceedings of the 23rd International Conference on Intelligent User Interfaces Companion (IUI '18), p. 45, 2018.

17. Shoya Ishimaru, Soumy Jacob, Apurba Roy, Syed Saqib Bukhari, Carina Heisel, Nicolas Großmann, Michael Thees, Jochen Kuhn and Andreas Dengel. "Cognitive State Measurement on Learning Materials by Utilizing Eye Tracker and Thermal Camera". In Proceedings of the 14th IAPR International Conference on Document Analysis and Recognition (ICDAR HDI '17), pp. 32–36, 2017.

18. Shoya Ishimaru, Kensuke Hoshika, Kai Kunze, Koichi Kise and Andreas Dengel. "Towards Reading Trackers in the Wild: Detecting Reading Activities by EOG Glasses and Deep Neural Networks". In Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '17 Adjunct), pp. 704–711, 2017.

19. Koichi Kise, Olivier Augereau, Yuzuko Utsumi, Masakazu Iwamura, Kai Kunze, Shoya Ishimaru and Andreas Dengel. "Quantified Reading and Learning for Sharing Experiences". In Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '17 Adjunct), pp. 724–731, 2017.

20. Shoya Ishimaru and Andreas Dengel. "ARFLED: Ability Recognition Framework for Learning and Education". In Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '17 Adjunct), pp. 339–343, 2017.

21. Sabine Hoffmann, Helga Tauscher, Andreas Dengel, Shoya Ishimaru, Sheraz Ahmed, Jochen Kuhn, Carina Heisel and Yutaka Arakawa. "Sensing Thermal Stress at Office Workplaces". In Proceedings of the 5th International Conference on Human-Environment Systems (ICHES '16), 2016.

22. Shoya Ishimaru. "Cognitive State Recognition for Developing Anticipating Textbook". In Proceedings of the 9th International Conference on Mobile Computing and Ubiquitous Networking (ICMU '16), pp. 1–2, 2016.

23. Shoya Ishimaru, Syed Saqib Bukhari, Carina Heisel, Jochen Kuhn and Andreas Dengel. "Towards an Intelligent Textbook: Eye Gaze Based Attention Extraction on Materials for Learning and Instruction in Physics". In Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '16 Adjunct), pp. 1041–1045, 2016.

24. Shoya Ishimaru, Kai Kunze, Koichi Kise and Andreas Dengel. "The Wordometer 2.0: Estimating the Number of Words You Read in Real Life using Commercial EOG Glasses". In Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '16 Adjunct), pp. 293–296, 2016.

25. Shoya Ishimaru, Tilman Dingler, Kai Kunze, Koichi Kise and Andreas Dengel. "Reading Interventions: Tracking Reading State and Designing Interventions". In Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '16 Adjunct), pp. 1759–1764, 2016.

26. Christophe Rigaud, Thanh-Nam Le, J-C Burie, Jean-Marc Ogier, Shoya Ishimaru, Motoi Iwata and Koichi Kise. "Semi-Automatic Text and Graphics Extraction of Manga using Eye Tracking Information". In Proceedings of the 2016 12th IAPR Workshop on Document Analysis Systems (DAS '16), pp. 120–125, 2016.

27. Shoya Ishimaru and Koichi Kise. "Quantifying the Mental State on the Basis of Physical and Social Activities". In Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '15 Adjunct), pp. 1217–1220, 2015.

28. Kai Kunze, Katsuma Tanaka, Shoya Ishimaru, Yuji Uema, Koichi Kise and Masahiko Inami. "MEME: Eye Wear Computing to Explore Human Behavior". In Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '15 Adjunct), pp. 361–363, 2015.

29. Kai Kunze, Katsutoshi Masai, Masahiko Inami, Ömer Sacakli, Marcus Liwicki, Andreas Dengel, Shoya Ishimaru and Koichi Kise. "Quantifying Reading Habits: Counting How Many Words You Read". In Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp '15), pp. 87–96, 2015.

30. Kai Kunze, Kazutaka Inoue, Katsutoshi Masai, Yuji Uema, Sean Shao-An Tsai, Shoya Ishimaru, Katsuma Tanaka, Koichi Kise and Masahiko Inami. "MEME: Smart Glasses to Promote Healthy Habits for Knowledge Workers". In ACM SIGGRAPH 2015 Emerging Technologies (SIGGRAPH '15), p. 17, 2015.

31. Katsuma Tanaka, Shoya Ishimaru, Koichi Kise, Kai Kunze and Masahiko Inami. "Nekoze!: Monitoring and Detecting Head Posture while Working with Laptop and Mobile Phone". In Proceedings of the 9th International Conference on Pervasive Computing Technologies for Healthcare (Pervasive Health '15), pp. 237–240, 2015.

32. Shoya Ishimaru, Kai Kunze, Katsuma Tanaka, Yuji Uema, Koichi Kise and Masahiko Inami. "Smart Eyewear for Interaction and Activity Recognition". In Extended Abstracts of the 2015 CHI Conference on Human Factors in Computing Systems (CHI '15 EA), pp. 307–310, 2015.

33. Shoya Ishimaru, Kai Kunze, Koichi Kise and Masahiko Inami. "Position Paper: Brain Teasers - Toward Wearable Computing That Engages Our Mind". In Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '14 Adjunct), pp. 1405–1408, 2014.

34. Shoya Ishimaru, Kai Kunze, Yuji Uema, Koichi Kise, Masahiko Inami and Katsuma Tanaka. "Smarter Eyewear: Using Commercial EOG Glasses for Activity Recognition". In Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '14 Adjunct), pp. 239–242, 2014.

35. Shoya Ishimaru, Jens Weppner, Andreas Poxrucker, Paul Lukowicz, Kai Kunze and Koichi Kise. "Shiny: An Activity Logging Platform for Google Glass". In Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '14 Adjunct), pp. 283–286, 2014.

36. Shoya Ishimaru, Jens Weppner, Kai Kunze, Andreas Bulling, Koichi Kise, Andreas Dengel and Paul Lukowicz. "In the Blink of an Eye: Combining Head Motion and Eye Blink Frequency for Activity Recognition with Google Glass". In Proceedings of the 5th Augmented Human International Conference (AH '14), pp. 150–153, 2014. *Cited by 150 times*

37. Shoya Ishimaru, Kai Kunze, Yuzuko Utsumi, Masakazu Iwamura and Koichi Kise. "Where Are You Looking At? - Feature-Based Eye Tracking on Unmodified Tablets". In Proceedings of the 2013 2nd Asian Conference on Pattern Recognition (ACPR '13), pp. 738–739, 2013.

38. Kai Kunze, Shoya Ishimaru, Yuzuko Utsumi and Koichi Kise. "My Reading Life: Towards Utilizing Eyetracking on Unmodified Tablets and Phones". In Proceedings of the 2013 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication (UbiComp '13 Adjunct), pp. 283–286, 2013.

39. Kai Kunze, Yuki Shiga, Shoya Ishimaru and Koichi Kise. "Reading Activity Recognition Using an Off-the-Shelf EEG – Detecting Reading Activities and Distinguishing Genres of Documents". In Proceedings of the 2013 12th International Conference on Document Analysis and Recognition (ICDAR '13), pp. 96–100, 2013.

Miscellaneous (without peer review)

1. Shoya Ishimaru, Takanori Maruichi, Andreas Dengel and Koichi Kise. "Confidence-Aware Learning Assistant". In arXiv preprint arXiv:2102.07312, 2021.

CV compiled on November 1st, 2021.