

Katsunori Oyama (July, 2021)

Contact Information

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Nihon University
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Academic Work and Education

Associate Professor	Nihon University	April 2014 - Present
Assistant Professor	Nihon University	April 2011 - March 2014
Postdoctoral Researcher	Iowa State University	November 2007 - December 2010
Ph.D., Engineering	Nihon University	March 2007
M.S., Computer Science	Nihon University	March 2003
B.S., Computer Science	Nihon University	March 2001

Research Interests

Ontology in machine learning models, DIKW (Data, Information, Knowledge and Wisdom), Human thought processes and intentions, Situation-Awareness, Service Evolution and Digital Health

External Research Grants

18,220,000 yen (Roughly 160K USD), Co-Principle Investigator, April 2020 – March 2022
Nihon University Multidisciplinary Research Grant (20-1401)
Development of a healthcare system using saliva biomarker for periodontal disease-related systemic disease

496,800 yen (Roughly 4K USD), December 2018 – February 2019
Funded research, **Futaba Inc.**
Software development on analysis tool on radiation dose mapping from the observation data using Unmanned Aerial Vehicle (continued)

200,000 yen (Roughly 2K USD), December 2017 – November 2018
Funded research, **Job crown Co. Ltd.**
Software development on AI-enabled authentication system

496,800 yen (Roughly 4K USD), December 2017 – February 2018
Funded research, **Futaba Inc.**
Software development on analysis tool on radiation dose mapping from the observation data using Unmanned Aerial Vehicle

3,900,000 yen (Roughly 34K USD), Sole Principle Investigator, 2016 – 2018
Japan Society for the Promotion of Science KAKENHI grants Grant-in-Aid for Young Scientists (B) 16K16077
Discovery of the relation between brain activity and silence in conversations from simultaneous monitoring of EEG and NIRS signals

3,770,000 yen (Roughly 33K USD), Sole Principle Investigator, 2014 – 2016
Japan Society for the Promotion of Science KAKENHI grants Grant-in-Aid for Young Scientists (B) 26730079
Discovery of causal factors in failure conversations by comparison between turn-takings and brain activities among collaborative workers

Selected Publications

Full publication list is available at http://kenkyu-web.cin.nihon-u.ac.jp/Profiles/89/0008822/prof_e.html
(total citations: 318+, h-index: 10)

Journal Papers

1. **Katsunori Oyama**, Kaoru Sakatani. Machine Learning-based Assessment of Cognitive Impairment using Time-resolved Near-infrared Spectroscopy and Basic Blood Test Data. *Frontiers in Neurology*, accepted, 2021.
2. Sho Kojima, Shinichiro Morishita, Kazuki Hotta, Weixiang Qin, Toshinori Kato, **Katsunori Oyama**, Atsuhiko Tsubaki. Relationship Between Decrease of Oxygenation During Incremental Exercise and Partial Pressure End-Tidal Carbon Dioxide: Near-Infrared Spectroscopy Vector Analysis. *Advances in Experimental Medicine and Biology*, Vol. 1269, pp. 119-124, 2021.
3. Weixiang Qin, S Kojima, S Morishita, K Hotta, **K Oyama**, A Tsubaki. Effects of 20-Minute Intensive Exercise on Subjects with Different Working Memory Bases. *Advances in Experimental Medicine and Biology*, Vol. 1269, pp. 289-294, 2021.
4. Labiblais Rahman, **Katsunori Oyama**, Atsuhiko Tsubaki, Kaoru Sakatani. Event-Related NIRS and EEG Analysis for Mental Stress Monitoring. *Advances in Experimental Medicine and Biology*, Vol. 1269, pp. 9-13, 2021.
5. Kaoru Sakatani, **Katsunori Oyama**, Lizhen Hu. Deep learning-based screening test for cognitive impairment using basic blood test data for health examination. *Frontiers in Neurology*, 11:1660, 2020.
6. Y. Komuro, **K. Oyama**, L. Hu, K. Sakatani. Relationship Between Cognitive Dysfunction and Systemic Metabolic Disorders in Elderly: Dementia Might be a Systematic Disease. *Advances in Experimental Medicine and Biology*, Vol. 1232, pp. 91-97, 2020.
7. Kaoru Sakatani, Lizhen Hu, **Katsunori Oyama**, Yukio Yamada. Effects of Aging, Cognitive Dysfunction, Brain Atrophy on Hemoglobin Concentrations and Optical Pathlength at Rest in the Prefrontal Cortex: A Time-Resolved Spectroscopy Study. *Applied Sciences*, 9(11): 2209, 2019.
8. **Katsunori Oyama**, Lizhen Hu, Kaoru Sakatani. Prediction of MMSE score using time-resolved near-infrared spectroscopy. *Advances in Experimental Medicine and Biology*. Vol. 1072, pp. 145-150, 2018.
9. Carl K. Chang, **Katsunori Oyama**. Guest Editorial: A Roadmap for Mobile and Cloud Services for Digital Health. *IEEE Transactions on Services Computing*, Vol. 11, No. 2, pp. 232-235, 2018.
10. **Katsunori Oyama**, Kaoru Sakatani. Temporal Comparison Between NIRS and EEG Signals During a Mental Arithmetic Task Evaluated with Self-Organizing Maps. *Advances in Experimental Medicine and Biology*. Vol.923, pp.223-229, 2016.
11. **Katsunori Oyama**, Carl K. Chang, Simanta Mitra. Inference of Human Intentions in Smart Home Environments. *International Journal of Robotics Applications and Technologies (IJRAT)*, IGI Global, Vol.1, No.2, pp.26-42, 2013.
12. **Katsunori Oyama**, Hiroyuki Watanabe, Masato Kaneko, Atsushi Takeuchi. Multi-modal Dialogue Analysis on Turn-taking and Difference of Variations in Brainwave between Cooperative Learners. *The Transactions of Human Interface Society*, Vol. 15, No. 4, pp. 353-362, 2013.
13. Carl K. Chang, Hsinyi Jiang, Hua Ming, **Katsunori Oyama**. Situ: A Situation-theoretic Approach to Context-Aware Service Evolution. *IEEE Transactions on Services Computing*, IEEE Computer Society, Vol. 2, No. 3, pp. 261-275, 2009.
14. **Katsunori Oyama**, Atsushi Takeuchi, Hiroshi Fujimoto. A Thought Process Expression for Finding Classes Using CAPIS Model and Quality Building Ontology. *IPSJ Journal*, Vol. 48, No. 8, pp. 2846-2858, 2007.
15. **Katsunori Oyama**, Atsushi Takeuchi, Hiroshi Fujimoto. The Expression of Design Thought Processes Using CAPIS Model. *IPSJ Journal*, Vol. 47, No. 8, pp. 2792-2806, 2006.

Peer-reviewed Conference Papers

1. **Katsunori Oyama**, Kaoru Sakatani. Deep Learning-based Prediction of Cognitive Function Using Basic Blood Test Data and NIRS-measured Cerebral Hemodynamics. In 2021 IEEE International Conference on Digital Health (ICDH), Sep. 2021.
2. Labiblais Rahman, **Katsunori Oyama**. Long-Term Monitoring of NIRS Signals for Mental Health Assessment. In 43rd IEEE Computer Society International Computer Software and Applications Conference (COMPSAC), pp. 663-666, 2019.
3. Hua Ming, **Katsunori Oyama**. Dimensional Situation Analytics: An Introduction and Its Application Prospects. In 2019 IEEE World Congress on Services (SERVICES), pp. 133-134, 2019.
4. Ryo Kikawa, **Katsunori Oyama**, Hua Ming. Landcover Based 3-Dimensional Inverse Distance Weighting for Visualization of Radiation Dose. In 2019 IEEE World Congress on Services (SERVICES), pp. 370-371, 2019.
5. Tokishi Morita, **Katsunori Oyama**, Taiju Mikoshi, Toshihiro Nishizono. Decision Making Support of UAV Path Planning for Efficient Sensing in Radiation Dose Mapping. In 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), pp. 333-338, 2018.
6. Labiblais Rahman, **Katsunori Oyama**. Long-Term Monitoring of NIRS and EEG Signals for Assessment of Daily Changes in Emotional Valence. In 2018 IEEE International Conference on Cognitive Computing (ICCC), pp. 118-121, 2018.
7. Labiblais Rahman, **Katsunori Oyama**. A Comparison of EEG and NIRS Biomarkers for Assessment of Depression Risk. In 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), pp. 831-832, 2018.
8. **Katsunori Oyama**, Kaoru Sakatani, Hua Ming, Carl K. Chang. Hierarchical Self-organizing Maps of NIRS and EEG Signals for Recognition of Brain States. In: Chang C., Chiari L., Cao Y., Jin H., Mokhtari M., Aloulou H. (eds) Inclusive Smart Cities and Digital Health, ICOST 2016, Lecture Notes in Computer Science, Vol. 9677, pp. 335-344, 2016.
9. **Katsunori Oyama**, Hiroyuki Watanabe, Atsushi Takeuchi. Visualization of Turn-Taking and Mental Workload in Collaborative Working Environment. Proceedings of the 2014 IEEE 18th International Conference on Computer Supported Cooperative Work in Design (CSCWD), pp. 140-145, 2014.
10. **Katsunori Oyama**, Atsushi Takeuchi and Carl K. Chang. Brain Lattice: Concept Lattice Based Causal Analysis of Changes in Mental Workload. Proceedings of 2013 IEEE International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA), pp.62-69, 2013.
11. **Katsunori Oyama**, Kazuki Nakamura, Hiroyuki Wakabayashi, Atsushi Takeuchi and Naoki Ishitsuka. Situational Map Integration of Dose Distribution on the Ground Surface using Unmanned Aerial Vehicles. Proceedings of 2013 IEEE International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA), pp.171-174, 2013.
12. **Katsunori Oyama**, Hiroyuki Wakabayashi, Atsushi Takeuchi and Naoki Ishitsuka. Integration of 3D Trajectory Maps into a Local Distribution Map of Radiation Dose Using Unmanned Aerial Vehicle. Proceedings of IEEE Annual Computer Software and Applications Conference Workshops (COMPSACW), pp.607-612, 2012.
13. **Katsunori Oyama**, Atsushi Takeuchi, Hua Ming and Carl K. Chang. A Concept Lattice in Real User Monitoring for Recognition of User Problems. Proceedings of 18th Asia-Pacific Software Engineering Conference (APSEC), 2011.
14. Hua Ming, Carl K. Chang, **Katsunori Oyama** and Hen-I Yang. Reasoning about Human Intention Change for Individualized Runtime Software Service Evolution. Proceedings of 34th IEEE Computer Society International Computer Software and Applications Conference (COMPSAC), pp.289-296, 2010.
15. Jeyoun Dong, Hen-I Yang, **Katsunori Oyama** and Carl K. Chang. Human Desire Inference Process Based on Affective Computing. Proceedings of the Doctoral Symposium at 34th IEEE Computer Society International Computer Software and Applications Conference (COMPSAC), pp.347-350, 2010.

16. **Katsunori Oyama**, Jeyoun Dong, Kai-Shin Lu, Hsinyi Jiang, Hua Ming and Carl K. Chang. Situation-Theoretic Analysis of Human Intentions in a Smart Home Environment. Proceedings of International Conference on Smart Homes and Health Telematics (ICOST), pp.125-132, 2009.
17. Carl K. Chang, **Katsunori Oyama**, Hojun Jaygarl and Hua Ming. On Distributed Run-Time Software Evolution Driven by Stakeholders of Smart Home Development. Proceedings of 2nd International Symposium of Universal Communications, Osaka, Japan, pp. 59-66, 2008.
18. Hua Ming, **Katsunori Oyama** and Carl K. Chang. Human-Intention Driven Self Adaptive Software Evolvability in Distributed Service Environments. Proceedings of IEEE International Workshop on Future Trends of Distributed Computing Systems (FTDCS), Kunming, China, Computer Society Press, pp. 51-57, 2008.
19. **Katsunori Oyama**, Hojun Jaygarl, Jinchun Xia, Carl K. Chang, Atsushi Takeuchi and Hiroshi Fujimoto. A Human-Machine Dimensional Inference Ontology that Weaves Human Intentions and Requirements of Context Awareness Systems. Proceedings of 32nd IEEE Computer Society International Computer Software and Applications Conference (COMPSAC), 287-294, 2008.
20. **Katsunori Oyama**, Hojun Jaygarl, Jinchun Xia, Carl K. Chang, Atsushi Takeuchi and Hiroshi Fujimoto. Requirements Analysis Using Feedback from Context Awareness Systems. Proceedings of Second IEEE International Workshop on Requirements Engineering For Services (REFS), pp.625-630, 2008.
21. **Katsunori Oyama**, Atsushi Takeuchi and Hiroshi Fujimoto. CAPIS Model Based Software Design Method for Sharing Experts' Thought Processes. Proceedings of 30th IEEE Computer Society International Computer Software and Applications Conference (COMPSAC), Vol. 1, pp. 307-314, 2006.

Book Chapters

1. **Katsunori Oyama**, Kouichi Genda, Yuuji Waizumi, Hiroyuki Wakabayashi. LOHAS and Computer Science (in Japanese). LOHAS Engineering. Nikkei Business Publications, pp.150-172, 2019.
2. **Katsunori Oyama**, Carl K. Chang and Simanta Mitra. Inference of Human Intentions in Context Aware Systems. In Fulvio Mastrogiovanni and Nak-Young Chong (Eds.). Handbook of Research on Ambient Intelligence and Smart Environments: Trends and Perspectives, IGI Global, pp.376-391, 2011.

Awards

1. Outstanding Service Award, IEEE Technical Committee on Services Computing (TCSVC), 2020.

Patent

1. K. Sakatani and K. Oyama. Score determination device of medical test on vital function, and program. JP2018149168A, 2018.

Professional Memberships

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| 1. IEEE Computer Society | 2009 – Present |
| 2. IPSJ (Information Processing Society of Japan) | 2000 – Present |
| 3. The Society for Instrument and Control Engineers | 2017 – Present |
| 4. International Society on Oxygen Transport to Tissue (ISOTT) | 2017 – Present |

Professional Services

1. IEEE World Congress on Services (IEEE SERVICES)
SERVICES Congress Workshop Chair 2021 – Present
2. IEEE SERVICES Workshop on Data, Information, Knowledge and Wisdom Networks (DIKWN)
Workshop Program Chair 2019 – Present
3. IEEE Annual International Computers, Software & Applications Conference (COMPSAC)
Symposium Co-Chair of Human Computing & Social Computing 2016 – Present
4. IEEE World Congress on Services (IEEE SERVICES)
SERVICES Congress Publication Chair 2018 – 2020
5. IPSJ JIP Journal, Special Issue on Applications and the Internet in Conjunction with Main Topics of
COMPSAC
Editorial Board Member 2015 – 2018
6. IEEE Transactions on Services Computing
Guest Editor of Special Issue on Mobile and Cloud Services for Digital Health 2016 – 2017
7. IEEE Annual International Computers, Software & Applications Conference (COMPSAC)
Symposium Chair of Human-Machine and Aware Computing 2015 – 2016
8. IEEE International Conference on Enabling Technologies: Infrastructures for Collaborative Enterprises
(WETICE)
Program Committee Member 2013 – 2015