The 28th EA-RTM

International Symposium on Pursuit of Well-Being in an Aging Society

December 5, 2025 (Friday)

Hosted by EAJ & Okayama University

Session Ⅰ：Ethical and legal issues for social implementation of STI

9:00-10:15 am (GMT+8) / 10:00-11:15 am (GMT+9)

Moderator: Prof. Nozomu Mishima, Engineering Academy of Japan

Dr. Rei Nouchi

Associate Professor, Research Institute for Higher Education, Hiroshima University

"Beyond Data Sharing: Ethical and Regulatory Challenges in the Use of Clinical and Synthetic Medical Data"

Dr. Taek Soo Kim

Chief Strategy Officer (CSO), VUNO

"From Innovation to Impact: How Industry Can Build Trustworthy Medical AI"

Prof. Qimin Zhan

Member, CAE, Peking University International Cancer Institute

"Ethics and Governance of Scientific & Technological Innovation"

Rei Nouchi
Associate Professor,
Research Institute for Higher Education,
Hiroshima University

Rei Nouchi is an Associate Professor at the Research Institute for Higher Education, Hiroshima University. He received bachelor's degrees in both Engineering and Letters from Nagoya University and subsequently pursued graduate studies in the Graduate School of Letters, where he specialized in the philosophy of science. He was awarded a Ph.D. in Humanities in 2012. After completing his doctorate, Nouchi joined the Division for Promoting Research Integrity at the School of Medicine, Shinshu University, where he engaged in education and the research and development of educational materials on research ethics and integrity from 2015 to 2022.

In 2023, he assumed his current position at Hiroshima University. His work focuses on research integrity and metascience in higher education, approached through the lenses of science studies and the philosophy of science. He is currently leading competitive research projects that analyze "reproducibility crisis in science" from an epistemological standpoint.

At Hiroshima University, Nouchi is also a member of the Center for Collaborative Sciences within the Headquarters for Co-creative Future Sciences, where he contributes to national initiatives for building networks and fostering the next generation of researchers in the fields of ELSI (Ethical, Legal, and Social Issues) and RRI (Responsible Research and Innovation). His professional appointments include serving on the Education and Research Promotion Committee of the Association for the Promotion of Research Integrity (APRIN) and as an Associate Member of the Science Council of Japan.

Beyond Data Sharing: Ethical and Regulatory Challenges in the Use of Clinical and Synthetic Medical Data

Rei Nouchi
Associate Professor,
Research Institute for Higher Education, Hiroshima University

In recent years, the sharing of clinical data has increasingly contributed to the advancement of research, accompanied by the establishment of appropriate management systems for collected samples under relevant laws and regulations. At the same time, as open data initiatives have expanded internationally, instances of inappropriate research practices using public datasets have also been observed. In response, some journals have begun announcing policies that restrict submissions to empirically grounded and original contributions—such as replication studies—to prevent questionable research practices arising from indiscriminate analyses of publicly available medical data and large language models (LLMs).

While open data initiatives are expected to enhance reproducibility, transparency, and cost efficiency in research, they have also raised concerns about their potential to fuel the mass production of low-quality publications, thereby posing challenges to research integrity. Furthermore, in some countries, studies using AI-generated synthetic data are exempt from ethical review as clinical research, revealing growing disparities in the international regulatory frameworks governing the use of clinical data.

Against this backdrop, this presentation addresses the ethical, legal, and social issues (ELSI) that arise beyond the mere sharing of clinical data—focusing on how shared datasets can be utilized fairly to foster responsible and sound research practices. In an aging society, where the effective and ethical use of clinical data directly relates to public welfare, we should understand this issue as urgent obstacle to our future. Moreover, as international collaborative research continues to expand, the standardization of legal and ethical compliance frameworks in response to emerging technologies and methodologies has become increasingly necessary.

Taek Soo Kim

Chief Strategy Officer (CSO), VUNO

Dr. Taek Soo Kim is the Chief Strategy Officer (CSO) at VUNO, where he leads global business strategy, corporate planning, market access, and product management operations. With over two decades of experience bridging technology and strategic management, he plays a key role in driving VUNO's global growth and innovation in artificial intelligence.

Before joining VUNO, Dr. Kim held multiple leadership roles at Samsung Electronics' Advanced Institute of Technology (SAIT), where he spearheaded long-term R&D planning and open innovation initiatives. As Program Manager and Head of Technology Strategy Group at SAIT, he led the development of Samsung's AI research roadmap and coordinated strategic collaborations with U.S. national research institutes. Earlier in his career, he served as a consultant at the Boston Consulting Group, where he specialized in technology and corporate strategy projects.

Dr. Kim earned his Ph.D. in Electrical Engineering from Stanford University, his M.S. in Electrical Engineering from the University of Southern California, and his B.S. in Electrical Engineering from Seoul National University.

From Innovation to Impact: How Industry Can Build Trustworthy Medical AI

Dr. Taek Soo Kim
Chief Strategy Officer (CSO), VUNO
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Rapid population aging and persistent healthcare workforce shortages are increasing the need for more resilient and efficient care systems, positioning medical AI as an essential component of future healthcare delivery. While AI has the potential to improve patient safety and clinical workflows, its real-world adoption raises important considerations related to responsible data use, equity across diverse populations, continuous clinical validation, and evolving regulatory expectations. This talk explores the practical issues and considerations that emerge as medical AI moves into everyday clinical practice.

Qimin Zhan

Member, Chinese Academy of Engineering
Director, Peking University International Cancer Institute and National Institute of Health Data Science at Peking University
Director, Molecular Oncology Laboratory Beijing Cancer Hospital
Former Executive Vice President of Peking University, Former Director of Peking University Health Science Center

Qimin Zhan has received Changjiang Scholarship of Ministry of Education. He is also a winner of the National Science Foundation for Distinguished Young Scholars and the national candidate of New Century Talent Project. He's a chief expert of Innovation Group of the National Natural Science Foundation of China, and a Chief scientist of the National Program on Key Basic Research Project of China (973 Program). He has been awarded Honorary Professorship at Kings College and University of Manchester, Visiting Professorship at Juntendo University and Keio University.

He currently serves as Chairman of Chinese Society of Microcirculation, Vice President of Chinese Medical Doctor Association, Vice President of China International Exchange and Promotive Association for Medical and Health Care, and Chairman of the Overseas Physicians division of the Western Returned Scholars Association.

He has been engaged in the research of molecular oncology and translational medicine for a long time. He made outstanding achievements in the field of molecular oncology, including the first demonstrations in tumor suppressor p53-regulated signaling pathways in the cell cycle checkpoints and genomic stability following genotoxic stress. He also made the first demonstration of genomic alterations in human esophageal squamous cell carcinoma (ESCC), defining significant mutated genes, copy number variations and structure veriations during the ESCC development. He has published more than 300 peer-reviewed papers and 13 books in international journals of medical biology. He has been invited as keynote speakers of national and international conferences for over 200 times and served as co-chairman of 15 international academic conferences.

Ethics and Governance of Scientific & Technological Innovation

Qimin Zhan
Member, Chinese Academy of Engineering, Peking University International Cancer Institute
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Global population aging is an irreversible social transformation. China, with the world's largest and most rapidly growing elderly population, confronts the complex reality of "growing old before getting rich," regional disparity, and diverse health needs. Here, innovations in digital technology, AI, and smart devices are seen as key to rebalancing elderly care, improving seniors' quality of life, and energizing the silver economy. Yet this technological promise is dual-edged, raising serious ethical concerns—from data privacy and algorithmic bias to eroded autonomy, social isolation, and unclear accountability. This presentation thus calls for channeling innovation through robust ethical and normative frameworks. It will outline a path for embedding "ethics by design" and "agile governance" throughout the R&D lifecycle of smart care technologies and propose a collaborative governance model involving government, industry, and academia. The ultimate goal is to ensure technology strengthens the capabilities of older persons and guides us toward a more just, inclusive, and dignified future for all.

Session Ⅱ：Promotion of social participation of the elderly and their families and reduction of social burdens

10:15-11:20 am (GMT+8) / 11:15-12:20 am (GMT+9)

Moderator: Prof. Yuko Harayama, Engineering Academy of Japan

Dr. Gong Chen

Director and Professor, Peking University Institute of Population Research

"AI for Community: Intergenerational Collaboration and Governance in Aging Communities"

Prof. Yuko Hayashi, Ph.D.

Member, EAJ, Yamaguchi University

"Potential for Supporting the Elderly using the Metaverse and Avatars"

Dr. Hye Jung Cho

Executive VP, Head of DxP Biz. Division of Samsung C&T

"Digital Companions in the Aging Era (AI Care for a Connected Generation)"

Gong Chen

Director and Professor, Peking University -
Institute of Population Research

Gong Chen is the Director of the Institute of Population Research at Peking University and the Director of the China Aging Cause Development Research Center at Peking University. Gong Chen holds the positions of Professor and Doctoral Supervisor, and concurrently serves as a Consultant for the United Nations Population Fund (UNFPA), Vice President of the China Population Association, Vice President of the China Research Society for the Development of Persons with Disabilities, Editor-in-Chief of the Chinese core journal Population and Development. Gong Chen also serves as an Editorial Board Member of the Oxford University journal Journal of Population Ageing.

Gong Chen's research primarily focuses on social gerontology, disability, and aging health. Gong Chen has published over 110 SCI/SSCI-indexed papers and more than 200 CSSCI/Chinese core journal articles. Gong Chen has led over 70 research projects, including the National Key R&D Program of the Ministry of Science and Technology and Major Projects of the National Social Science Fund of China.

Gong Chen has been recognized as a Young Scholar under the "Chang Jiang Scholars Program" and has received numerous awards, including the National Outstanding Individual for Assisting Persons with Disabilities, the Special Prize for Disability Surveys from the State Council Working Committee on Disability, and the First Prize for Scientific and Technological Progress from the Ministry of Education.

Session Ⅱ：Promotion of social participation of the elderly and their families and reduction of social burdens

AI for Community: Intergenerational Collaboration and Governance in Aging Communities

Gong CHEN
Director and Professor, Peking University Institute of Population Research
E-mail: chengong@pku.edu.cn

As China's aging population accelerates, traditional community governance models face significant challenges including service supply-demand mismatches and delayed response mechanisms. Against this backdrop, the "AI for Community" project, building upon decades of community case studies from the Institute of Population Research at Peking University, has developed an intelligent system that integrates artificial intelligence with community governance to promote "intergenerational co-construction" and advance the digital transformation of elderly-oriented community management.

Leveraging natural language processing, deep learning, and big data analytics, the system constructs a dynamic "demand-capacity-resource" adaptation model that enables precise service matching and intelligent scheduling. The project encompasses four core modules: an intelligent dialogue system that captures and analyzes elderly residents' needs in real-time; an express service system that generates personalized service solutions; a points management system that incentivizes volunteer participation; and a social prescription mechanism that integrates Peking University's expert resources to provide scientific intervention recommendations.

Key innovations include: conceptually integrating the "time-banking" with AI technology to form a "service-points-resources" closed-loop ecosystem; content-wise building dynamic demand maps and virtual simulation scenarios to enhance service adaptability; methodologically achieving human-machine collaboration and multi-stakeholder synergy to bridge the "digital divide" for the seniors; and strategically promoting industry-academia-research-application integration to deepen talent cultivation and social service.

Currently piloted in the Yan Yuan neighborhood, the project explores a smart governance pathway empowered by AI, enriched by humanistic care, and strengthened by institutional innovation, offering a replicable model for the digital transformation of aging communities across China.

Yuko Hayashi, Ph.D.
Fellow, Engineering Academy of Japan
Professor, Graduate School of Innovation and Technology Management, Yamaguchi University
Outside Director, JCR Pharmaceuticals Co., Ltd.
President, Japan MOT Society

Professor at the Graduate School of Innovation and Technology Management, Yamaguchi University, and Outside Director of JCR Pharmaceuticals Co., Ltd. After graduating from the University of Tokyo, professional experience includes system design and the development of object-oriented programming languages at IBM Japan, Ltd. Holds an M.S. from the Technology & Policy Program at the Massachusetts Institute of Technology (MIT) and a Ph.D. in Interdisciplinary Engineering from the University of Tokyo.

Research focuses on the mediating functions between science and policy through the lens of boundary organizations, with applications in medical innovation policy and science and technology policy. Particular areas of interest include the development of advanced medical products, the establishment of innovative regulatory science platforms to facilitate implementation, and the use of technology to achieve the Sustainable Development Goals (SDGs).

Current academic and professional affiliations include membership in the Engineering Academy of Japan, Affiliated Member of the Science Council of Japan, Visiting Collaborative Researcher in the Bio-innovation Policy Division, Department of Medical Life Innovation, Graduate School of Frontier Sciences, the University of Tokyo, and President of the Japan MOT (Management of Technology) Society.

Major public service and social contributions include serving as Expert Member of the Gender Equality Promotion Liaison Council of the Cabinet Office (until 2021); Board Member of JACFA, an NPO supporting socially withdrawn youth; Executive Board Member of the 3.11 Sports & Culture Support Organization for Earthquake Orphans; Board Member of the Kawamura Ikuei Educational Foundation; Board Member of Special Olympics Nippon (until 2023); President of the Pickleball Japan Federation; and Board Member of the Urakami Foundation for Food and Culinary Culture Promotion.

Session Ⅱ：Promotion of social participation of the elderly and their families and reduction of social burdens

Promotion of Social Participation of the Elderly and Their Families and Reduction of Social Burden

Potential for Supporting the Elderly using the Metaverse and Avatars

Yuko Hayashi, Ph.D.

During the COVID-19 pandemic, while socially vulnerable populations experienced increased isolation, the acceleration of IT adoption and digital transformation (DX) expanded opportunities for diverse forms of social participation and work. Taking advantage of this situation, Hayashi was involved in managing “Fukuoka Virtual Support ROOM”, a support program using avatars in a three-dimensional virtual space (metaverse), implemented collaboratively by Fukuoka Prefecture and the NPO JACFA during the pandemic. Although the primary participants of this program were long-term unemployed individuals, including those experiencing social withdrawal (hikikomori), this presentation examines the application of the system to older adults, exploring how new support methods enabled by avatars’ anonymity and the accessibility of virtual spaces may contribute to promoting social participation among older adults and reducing the burden on their families.

Hye Jung Cho

Executive Vice President, Head of DxP Biz. Division of Samsung C&T

Dr. Hye-Jung Cho received her Ph.D. in Chemical Engineering from Pohang University of Science and Technology (POSTECH) in 1996. She is a member of the National Academy of Engineering of Korea (NAEK) and serves as Vice President of Women in Science, Engineering and Technology in Korea (WITEK).

From 2000 to 2012, Dr. Cho served as Research Master at the Samsung Advanced Institute of Technology (SAIT), where she led foundational R&D initiatives in connected technologies and advanced system, establishing a strong technical base for Samsung's future innovation roadmaps.

Following her tenure at SAIT, she held several key leadership positions at Samsung Electronics, including Vice President of Strategic Marketing for the B2B Solution Group in the Home Appliance Division, Director of the IoT Solution Lab, and Director of the smart home solution lab at Samsung Research.

Dr. Cho is currently Executive Vice President and Head of the DxP Business Division at Samsung C&T Corporation, where she leads the planning, development, and commercial launch of data-based space experience platforms and IoT solutions. She is also fostering a win-win innovation ecosystem with startups through FutureScape, Samsung C&T's open innovation program.

Through her extensive career across Samsung Electronics and Samsung C&T, Dr. Cho has contributed to advancing digital transformation and smart living environments, combining engineering innovation with user-centric solutions.

Session Ⅱ : Promotion of social participation of the elderly and their families and reduction of social burdens

Digital Companions in the Aging Era (AI Care for a Connected Generation)

Dr. Hyejung Cho
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The world is facing an era of rapidly accelerating population aging, a trend particularly pronounced in South Korea, which exhibits the fastest aging rate globally. This demographic shift generates critical social issues, including a sharp increase in single-person senior households (projected to reach 40% of senior-headed households by 2050) and a consequent surge in mental loneliness and depression. Furthermore, the demographic reality presents an acute socio-economic burden, highlighted by a projected support ratio of approximately 80 seniors per 100 working-age individuals, coupled with escalating social expenditures and a severe shortage of care personnel.
This study investigates a transformative solution: a senior-specific home robot designed to fulfill the dual roles of companionship and essential care. This digital companion integrates cutting-edge AI Agent technology, IoT connectivity, and autonomous navigation capabilities. We conducted a detailed, real-world demonstration to empirically evaluate the robot's specific roles, efficacy, and ability to integrate seamlessly within the daily lives of seniors.
The findings aim to provide crucial evidence on how AI-driven care, facilitated by digital companions in a hyper-aged society, can fundamentally transform and enrich the quality of later life while effectively mitigating the escalating societal burdens of caregiving, labor shortages, and economic strain.

Session Ⅱ : Promotion of social participation of the elderly and their families and reduction of social burdens

Session Ⅲ：Challenges of human-centered medical and nursing care in an aging society and solutions through innovation

13:00-14:05 pm (GMT+8) / 14:00-15:05 pm (GMT+9)

Moderator: Dr. Hideki Hayashi, Engineering Academy of Japan

Dr. Chulhong Kim

Professor, Electrical Engineering at Pohang University of Science and Technology

"Wearable Biomedical Integrated Circuits for Aging Population"

Dr. Ning Guang

Member, CAE, President, Ruijin Hospital, Shanghai Jiao Tong University

"Advanced Medical Technologies for Aging Society"

Dr. Atsushi Nakazawa

Okayama University

"Computational tender-care science: Computational and cognitive neuroscientific approaches"

Chulhong Kim

Professor, Electrical Engineering at Pohang University of Science and Technology

Dr. Chulhong Kim is Namgo Chair Professor, POSTECH Young Distinguished Professor, and Mueunjae Chair Professor at Pohang University of Science and Technology (POSTECH), where he serves as Head of the School of Convergence Science and Technology and Chair of the Department of Convergence IT Engineering. He also directs the Medical Device Innovation Center and serves as Vice Director of the POSTECH–Catholic BioMed Engineering program.

He earned his Ph.D. and completed postdoctoral training at Washington University in St. Louis under the supervision of Dr. Lihong V. Wang, Dr. Younan Xia, and Dr. Samuel Achilefu. Before joining POSTECH, he was Assistant Professor of Biomedical Engineering at the University at Buffalo, State University of New York, and a Visiting Associate Professor at Stanford University and Mayo Clinic.

Dr. Kim has published more than 275 peer-reviewed journal papers, 144 conference papers, and eight book chapters. His research has been cited over 22,000 times, with an h-index of 83. He holds 81 domestic and international patents and has secured approximately 25 million USD in research funding since 2010. His research team has developed advanced biomedical imaging systems including photoacoustic, ultrasound, optical, and fluorescence imaging, and successfully translated them into clinical and commercial applications. His group’s work has led to two spin-off companies, PAMsTECH and OPTICHO.

He has received numerous national and international honors including the 2022 Korean Presidential Award, Ministerial Awards from the Ministry of Science and ICT and the Ministry of Health and Welfare, the Science and Technology Award of the Month (2021), the IEEE EMBS Distinguished Lecturer (2020–2021), the IEEE EMBS Academic Early Career Achievement Award (2017), and the Young Scientist Award from the Korean Academy of Science and Technology (2017).

Dr. Kim serves as Section Editor of Photoacoustics, Senior Area Editor of IEEE Transactions on Medical Imaging, and Associate Editor of IEEE Transactions on Biomedical Engineering. He is actively involved in organizing major international conferences such as SPIE Photonics West, OSA Biophotonics Congress, and IEEE EMBS Annual Meetings. His research focuses on developing multimodal biomedical imaging technologies for clinical diagnosis and precision medicine.

Session Ⅲ : Challenges of human-centered medical and nursing care in an aging society and solutions through innovation

Wearable Biomedical Integrated Circuits for Aging Population

Prof. Chulhong Kim
NAEK Member
Namgo Chair Professor, Young Distinguished Professor, and Mueunjae Chair Professor of Convergence IT Engineering, Medical Science and Engineering, Electrical Engineering, and Mechanical Engineering
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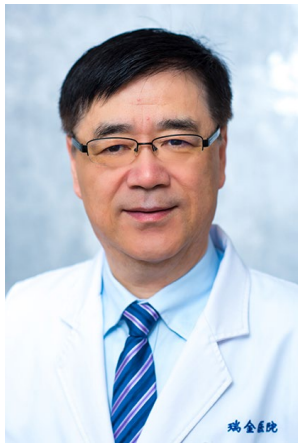
The rapid expansion of the global aging population necessitates next-generation wearable biomedical technologies capable of continuous, unobtrusive, and clinically actionable health monitoring. Recent advances in wearable biomedical integrated circuits—encompassing low-power sensor arrays, ultralow-noise analog front-ends, flexible electronics, and embedded machine-learning accelerators—are transforming the landscape of geriatric healthcare. This talk presents a comprehensive overview of wearable biomedical devices specifically optimized for physiological monitoring in older adults, including multimodal sensing of cardiovascular, metabolic, neuromuscular, and behavioral parameters. We highlight innovations in energy-autonomous circuit design, soft and stretchable substrates, and closed-loop therapeutic interfaces, which collectively enable continuous operation with minimal user burden. Integration of advanced signal-processing pipelines and on-chip AI enhances robustness against motion artifacts and age-associated physiological variability. Finally, we discuss translational barriers—including regulatory constraints, long-term biocompatibility, cybersecurity, and large-scale validation—as well as future directions toward seamless hospital-to-home ecosystems.

NING Guang
Member, Chinese Academy of Engineering
President, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine



Practiced as an endocrinologist for 30+ years, Prof. NING Guang is the Guang Qi Professor in Shanghai Jiao Tong University and now serves as the President of Ruijin Hospital, Shanghai Jiao Tong University School of Medicine. He is elected as a member of Chinese Academy of Engineering in 2015. Prof. Ning dedicates his life career to clinical and basic research on endocrine and metabolic diseases, e.g. diabetes, obesity, endocrine tumors and etc. He is trained as a clinical doctor in China and as a postdoctoral fellow in Baylor College of Medicine in USA.

Prof. Ning has extensively engaged with science collaboration. He received the Chinese International Endocrinology Award from American Association of Clinical Endocrinologists; the Lifetime Achievement Award from Israeli Diabetes Association and Israeli Ministry of Health; ANM-Servier Medical Prize from French National Academy of Medical Sciences; Yutaka Seino Outstanding Leadership Award from the Asian Association for the Study of Diabetes; and Honorary Fellowship Award from American College of Cardiology. He is elected to serve as an Advisory Committee member of InterAcademy Partnership (IAP) during 2023-2028.

Session Ⅲ : Challenges of human-centered medical and nursing care in an aging society and solutions through innovation

The Epoch of Digital Medicine：Practices from Chronic Disease Management to Life-cycle Health Management

NING Guang
Member, Chinese Academy of Engineering
President, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine

Major advances in digital medicine, focusing on chronic disease management, metabolic health, and lifecycle health services, have attracted much attention over the past decade. A series of nationwide cohorts and clinical studies—including ChinaMAP, CNDS, 4C, BPROAD, MMC, and GOCY—have generated large-scale metabolic and epidemiological evidence. These studies enrolled millions of participants and produced influential findings published in leading journals such as NEJM, JAMA, Lancet, BMJ, Nature, and others. Key insights include the high prevalence of diabetes among Chinese adults, insulin resistance as the main driver of rising disease burden, and the genetic landscape of obesity in young Chinese populations.

A central innovation is the Metabolic Management Center (MMC), a standardized, one-stop system for the diagnosis, treatment, and long-term management of metabolic diseases. Initiated in 2016, MMC integrates medical devices, IoT technology, unified SOPs, and quality control across 2,000 hospitals in 32 provinces. The model significantly improves glycemic control and metabolic indicators and supports nationwide diabetic retinopathy (DR) screening through AI-assisted imaging interpretation. MMC also contributed essential digital health practices during the COVID-19 pandemic.

Session Ⅲ：Challenges of human-centered medical and nursing care in an aging society and solutions through innovation

Atsushi Nakazawa
Professor
Faculty of Interdisciplinary Science and Engineering in Health Systems Okayama University

Dr Atsushi Nakazawa is a professor at the Faculty of Interdisciplinary Science and Engineering in Health Systems at Okayama University. He received his Ph.D. in systems engineering from Osaka University in 2001. He then worked at the Institute of Industrial Science, University of Tokyo, and then at the Cybermedia Center, Osaka University. From 2013 to 2023, he was an Associate Professor in the Department of Computer Science at Kyoto University. In 2003, he moved to Okayama University.

From 2007 to 2008, he was a visiting researcher at the Georgia Institute of Technology (GaTech), GVU Center, working with Professor James M Rehg and Professor Irfan Essa. In 2010, he was awarded the Precursory Research for Embryonic Science and Technology (PRESTO), Japan Science and Technology Agency (JST), and became a researcher of this programme. Since October 2017, he has been the Programme Investigator (PI) of the JST CREST project "Computational and cognitive neuroscientific approaches for understanding the tender care".

His research interests are in human behaviour/mental analysis using computer vision, eye tracking, eye imaging and motion capture systems. Dr Nakazawa has received best paper awards from Japan Robotics Society (RSJ) and IEEE VSMM. His recent interests include image processing and computer vision, pattern recognition, robotics, and affective computing.

Atsushi Nakazawa
Professor
Faculty of Interdisciplinary Science and Engineering in Health Systems Okayama University

Recent Publications:

1. Goshi Imamura and Atsushi Nakazawa. 2025. Presentation Quality Assessment through Audience 3D Facial and Head Direction Using Conventional Cameras. Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 9, 3, Article 90 (September 2025), 2025.
2. YA Sari, A Nakazawa, YA Wani, LeFood-set: Baseline performance of predicting level of leftovers food dataset in a hospital using MT learning, PloS one, 2025.
3. Y. Mitsuzumi, A. Kimura, G. Irie and A. Nakazawa, "Cross-Action Cross-Subject Skeleton Action Recognition Via Simultaneous Action-Subject Learning With Two-Step Feature Removal," 2024 IEEE International Conference on Image Processing (ICIP), Abu Dhabi, United Arab Emirates, 2024, pp. 2182-2186
4. Y Mitsuzumi, G Irie, A Kimura, A Nakazawa, Phase Randomization: A data augmentation for domain adaptation in human action recognition, Pattern Recognition, 2024.
5. Touching with Eye Contact and Vocal Greetings Increases the Sense of Security, M Iwamoto, A Nakazawa - Human Activity and Behavior Analysis, 2024.
6. A Nakazawa, M Iwamoto, R Kurazume, M Nunoi, M Honda and S Yoshikawa, Augmented reality-based affective training for improving care communication skill and empathy, PLoS one, 2023.
7. W Sato, A Nakazawa, S Yoshikawa, T Kochiyama , Behavioral and neural underpinnings of empathic characteristics in a Humanitude-care expert, Frontiers in Medicine, 2023.
8. Sumioka, Hidenobu; Shiomi, Masahiro; Honda, Miwako; Nakazawa Atsushi, Technical Challenges for Smooth Interaction With Seniors With Dementia: Lessons From Humanitude™, Frontiers in Robotics and AI, Vol. 8, pages. 162, 2021.
9. Yuguchi, Akishige, Sano, Tetsuya, Garcia Ricardez, Gustavo, Takamatsu, Jun, Nakazawa Atsushi, Ogasawara, Tsukasa. Evaluating imitation and rule-based behaviors of eye contact and blinking using an android for conversation. Advanced Robotics. 35. 1-12.,2021. https://doi.org/10.1080/01691864.2021.1928544.
10. Ohshima, Yuki and Maeda, Kyosuke and Edamoto, Yusuke and Nakazawa Atsushi, Visual Place Recognition From Eye Reflection, IEEE Access, Vol. 9, pp. 57364-57371, 2021.

Computational tender-care science
--Computational and cognitive neuroscientific approaches for understanding the tender care--

Atsushi Nakazawa
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In this project, we focus on the skills of “tender caregiving” for people with dementia. We measure caregiving behaviors using wearable sensors and artificial intelligence (AI), and understand the emotional cognition mechanism of “tender caregiving” by measuring brain activity. Based on this, we will develop methods and systems to learn caregiving skills. We will also develop a technology to visualize the effectiveness of gentle caregiving for caregivers, and verify its effectiveness by measuring and verifying it in actual medical and nursing care settings.

This project focuses on “Humanitude,” which is internationally known as a nursing care skill system. Humanitude is a multimodal communication technique that comprehensively and seamlessly performs multiple elements at the same time, centered on the four skills of gazing, touching, talking, and standing, and is a “gentle care technique” that encourages the caregiver to become more active and reduces the burden on the patient. This research aims to elucidate this skill computationally and neuroscientifically. Computationally, we analyzed the “gazing” skill using image recognition, the “touching” skill using contact and electromyography, the “standing” skill using motion capture and dynamics analysis, and the “talking” skill using voice information, and while referring to methods for integrating multiple skills based on observations at actual nursing care sites, we investigated the differences between good and bad nursing care skills. We will use sensing data to objectively understand what the differences are between good caregiving skills and poor ones, while referring to methods for integrating multiple skills based on observations at actual caregiving sites.

As an effort to explore the cognitive aspect of gentle caregiving, we will quantify the cognitive changes that occur when caregivers experience the skills of humanitude through the measurement of facial muscle activity and brain activity (fMRI). This will allow us to empirically verify the proposal that the humanitude skills evoke positive emotions such as kindness and warmth, and to elucidate the mechanism of action in the brain that produces such cognitive changes. If caregiving skills can be extracted from the above computational and brain science analysis, it will be possible to implement a system that can automatically evaluate caregiving skills using wearable devices and the IoT.

We will test these systems at medical institutions and nursing care facilities, and verify whether learners who want to learn “gentle nursing care” will be able to self-learn their skills.