

The 3rd International Symposium of the Institute for AI and Beyond

February 17 (Fri.), 2023 3:00pm-6:30pm (JST)

Event Format: Hybrid (Onsite + Online)

Onsite Venue:

Ito Hall (B2F, Ito International Research Center, The University of Tokyo) Online: Zoom webinar

Exploring the boundary between brain intelligence and artificial intelligence: What is needed to realize "Beyond AI"?

Event Overview

Recent research on the brain and artificial intelligence has shown remarkable progress. What are the similarities and differences between the two different types of intelligence? And what can be achieved by combining these two? While the fusion of the brain and artificial intelligence has the potential to create the "Beyond AI" field that surpasses current biological and artificial intelligence, there are many challenges that need to be overcome, including ethical issues. In this symposium, we will discuss the present and future of brain and artificial intelligence research and ask what is needed to realize "Beyond AI".





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Exploring the boundary between brain intelligence and artificial intelligence: What is needed to realize "Beyond AI"?

Program

Opening Remarks	Teruo Fujii President, The University of Tokyo Junichi Miyakawa President & CEO, SoftBank Corp.
Purpose of the Event	Yuji Ikegaya Professor, Graduate School of Pharmaceutical Sciences, The University of Tokyo
1st Session	
Special Lecture	Miguel NicolelisM.D., Ph.D. Distinguished Professor Emeritus of Neurobiology, Duke UniversityKenichi OhkiProfessor, Graduate School of Medicine / International Research Center for Neurointelligence (IRCN), The University of TokyoIrina HigginsResearch Scientist, DeepMind
	Break
	Edward ChangProfessor, Neurological Surgery, UCSF Weill Institute for NeurosciencesYukie NagaiProject Professor, International Research Center for Neurointelligence (IRCN), The University of TokyoRafael YusteProfessor, Biological Sciences / Director, NeuroTechnology Center, Columbia University

Break

2nd Session	1
Panel Discussion	What future will advances in the brain and AI create?
	Moderator Yuji Ikegaya Professor, Graduate School of Pharmaceutical Sciences, The University of Tokyo
	Panelists Noriko Arai Professor, Director of Research Center for Community Knowledge, National Institute of Informatics Director General of Institute of Science for Education Senior Researcher, Sony Computer Science Laboratories, Visiting Professor, The University of Tokyo
	Yuko Itatsu Professor, Graduate School of Interdisciplinary Information Studies/ Graduate School of Arts and Sciences, The University of Tokyo
	Masashi Sugiyama Professor, Graduate School of Frontier Sciences, The University of Tokyo
Closing Remarks	Masami Hagiya Director, Institute for AI and Beyond, The University of Tokyo
MC	Daichi Konno Medical Doctor, The University of Tokyo Hospital

Language: English/Japanese (Simultaneous interpretation offered)

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Opening Remarks



Teruo Fujii President, The University of Tokyo

Dr. Teruo Fujii became the 31st President of the University of Tokyo (UTokyo) on April 1, 2021, with a six-year term. He was previously the Executive Vice President in charge of finance and external relations for the university. He also served as the Director General of the Institute of Industrial Sciences (IIS) of the university from 2015 to 2018. He received his Ph.D. in engineering from UTokyo in 1993 and held research received the determine a profession of the second se positions at IIS and RIKEN prior to becoming a professor of IIS in 2007.



Junichi Miyakawa President & CEO, SoftBank Corp.

Junichi Miyakawa is President & CEO at SoftBank Corp. (since 2021), and also serves as President and CEO of HAPSMobile Inc. and Director of MONET Technologies Inc. Miyakawa's past positions include Technical Chief Operating Officer at US-based Sprint Corporation (2014), Director, Executive Vice President & CTO of SoftBank Mobile Corp. (now SoftBank Corp.) (2007), Director of SoftBank BB Corp. (now SoftBank Corp.) (2003) and Representative Director & President of Nagoya Metallic Communications Corp. (now SoftBank Corp.) (2000). Prior to these positions, UK Metallic Communications Corp. (now SoftBank Corp.) (2000). Prior to these positions, UK Metallic Communications Corp. (now SoftBank Corp.) (2000). in 1991 he became Representative Director & President of KK Momotaro Internet.

Purpose of the Event



Yuji Ikegaya Professor, Graduate School of Pharmaceutical Sciences, The University of Tokyo

Born in 1970. Ph.D. in Pharmaceutical Sciences from the University of Tokyo in 1998. Dr. Ikegaya studied at Columbia University (New York, USA) from 2002 to 2005, and he has been in his current position (Professor, Faculty of Pharmaceutical Sciences, The University of Tokyo) since 2014. His specialty is neurophysiology, exploring brain health. He is also the head of the ERATO Brain-AI Hybrid Project since 2018, which aims to pioneer new intelligence through brain implantation of AI chips. He has received the Young Scientists' Prize of the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (2008), the Japan Society for the Promotion of Science (2013), and the Japan Academy Prize for Academic Encouragement (2013), among others. His publications include many popular science books for the general public.

1st Session



Miguel Nicolelis M.D., Ph.D. Distinguished Professor Emeritus of Neurobiology, Duke University

Miguel Nicolelis, M.D., Ph.D., is a Distinguished Professor Emeritus of Neurobiology at Duke University, where he also served as a Professor of Biomedical Engineering, Neurology, Neurosurgery, and Psychology and Neuroscience; and founder of Duke's Center for Neuroengineering. He is founder and Scientific Director of the Edmond and Lily Safra International Institute for Neuroscience of Natal; and founder of the Walk Again Project, an international consortium of scientists/engineers, dedicated to developing an exoskeleton device to assist paralyzed patients in regaining their mobility. As a world-renowned leader in understanding the physiological principles that govern mammalian brain circuits, their dynamics and plastic

potential in freely behaving animals, Dr. Nicolelis worked to integrate this knowledge with a variety of engineering and computer science tools to create a new paradigm - brain-machine interfaces - which launched the field of neuroengineering.

Dr. Nicolelis led the creation of a new generation of neuroprosthetic devices which will likely change the future face of clinical neurology and neurosurgery.



Kenichi Ohki Professor, Graduate School of Medicine / International Research Center for Neurointelligence (IRCN), The University of Tokyo

Graduated from Faculty of Medicine, the University of Tokyo in 1996. PhD in Medicine from the Graduate School of Medicine, the University of Tokyo in 2000. After working as an assistant at the University of Tokyo, a research fellow and an instructor at Harvard Medical School, he became a professor at Graduate School of Medicine, the University in 2010 and a professor at Graduate School of Medicine, the University of Tokyo in 2010. Professor Oki is a leading expert on functional imaging of neurons in the brain. He is a global pioneer in technology used to measure the activities of housands of neurons, and he uses this technology to reconstruct brain information in AI. Ohki pursues a greater understanding of brain information processing in order to develop next-generation AI that functions similarly to the brain.

Irina Higgins Research Scientist, DeepMind

Irina is a Staff Research Scientist at DeepMind, where she works in the Frontiers team. Her work aims to bring together insights from the fields of Initials a Static Research Scientist at DeepMind, where she works in the Prohabits team. Her work aims to bring together insights from the fields of neuroscience and physics to advance general artificial intelligence through improved representation learning. Before joining DeepMind, Irina was a British Psychological Society Undergraduate Award winner for her achievements as an undergraduate student in Experimental Psychology at Westminster University, followed by a DPhil at the Oxford Center for Computational Neuroscience and Artificial Intelligence, where she focused on understanding the computational principles underlying speech processing in the auditory brain. During her DPhil, Irina also worked on developing poker AI, applying machine learning in the finance sector, and working on speech recognition at Google Research.



Edward Chang Professor, Neurological Surgery, UCSF Weill Institute for Neurosciences

Dr. Edward Chang is a neurosurgeon who treats patients with epilepsy, brain tumors, and cranial nerve compression syndromes such as trigeminal neuralgia and hemifacial spasm. He is Chairman of the Department of Neurological Surgery at UCSF. He co-directs the Center for Neural Engineering and Prostheses, a collaborative enterprise of UCSF and the University of California, Berkeley. The

center brings together experts in engineering, neurology and neurosurgery to develop state-of-the-art biomedical technology to restore function for patients with neurological disabilities such as paralysis and speech disorders.

Dr. Chang earned his medical degree at UCSF, where he also completed a residency in neurosurgery. He was honored with the Blavatnik National Laureate for Life Sciences in 2015, in recognition of his contributions to deciphering the neural code of speech. Dr. Chang is the inaugural Bowes Biomedical Investigator at UCSF and HHMI Faculty Scholar. Dr Chang was inducted to the National Academy of Medicine in 2020.



Yukie Nagai Project Fibreson, _____ The University of Tokyo Project Professor, International Research Center for Neurointelligence (IRCN),

Ph.D. in Engineering from Osaka University in 2004. Yukie Nagai is a Project Professor, International Research Center for Neurointelligence (IRCN), the University of Tokyo and has been engaged in the Basic Research "AI and Society" of the Institute for AI and Beyond as a project leader. She has been investigating underlying neural mechanisms for social cognitive development by computational approaches. She was elected to "30 women in robotics you need to know about" in 2019, "World's 50 Most Renowned Women in Robotics" in 2020, and "35 Women in Robotics Engineering and Science" in 2022.



Rafael Yuste Professor, Biological Sciences / Director, NeuroTechnology Center, Columbia University

Rafael Yuste, M.D., Ph.D., is a neuroscientist that studies the cerebral cortex at Columbia University, where he is Professor of Biological Sciences and Director of the Neurotechnology Center. He led the researchers who proposed the US BRAIN Initiative, and the International BRAIN Initiative. He also led the "Morningside Group" of 25 researchers and clinicians who proposed novel human rights ("Neurorights") to protect brain activity and its information. He has obtained awards for his research from the Mayor of New York City, the Society for Neuroscience and the Director of the NIH. He shared the Tällberg/Eliasson Global Leadership Prize for his science and ethics advocacy work.



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2nd Session



Noriko Arai Professor, Director of Research Center for Community Knowledge, National Institute of Informatics Director General of Institute of Science for Education

Noriko Arai received her doctoral degree in science from Tokyo Institute of Technology in 1997. Her research interests are quite interdisciplinary: mathematical logic, artificial intelligence, cognitive science, math education, computer supported collaborative learning, science of science policy (SoSP) etc. She is leading several projects. Netcommons Project, researchmap Project, Todai Robot Project, Reading Skill Test Project etc.She was awarded many prizes including Prizes for Science and Technology, the Commendation for Science and Technology by Ministry of Education and Technology in 2010 and 2021.



Panelist Kenichiro Mogi Senior Researcher, Sony Computer Science Laboratories, Visiting Professor, The University of Tokyo

Ken Mogi is a neuroscientist, writer, and broadcaster based in Tokyo, interested in the mind-brain problem. He is the author of A little Book of Ikigai (1997) and The Way of Nagomi (2022).



Panelist

Panelist

Yuko Itatsu Professor, Graduate School of Interdisciplinary Information Studies/ Graduate School of Arts and Sciences, The University of Tokyo

Ph. D. in History from the University of Southern California in 2009. Yuko Itatsu is a Professor at the Graduate School of Interdisciplinary Information Studies, The University of Tokyo. Since October 2022, she has become the project leader of the B' AI Global Forum which investigates the norms, ethics and praxis for a gender-equal society which guarantees minority rights in the AI age. She is a social and cultural historian specializing in quotidian practices of media, leisure and power. She joined the Women in AI Asia Pacific Advisory Board in 2022.



Panelist

Masashi Sugiyama Professor, Graduate School of Frontier Sciences, The University of Tokyo

Masashi Sugiyama received his Ph.D. in Computer Science from Tokyo Institute of Technology in 2001. After working as an assistant and associate professor at the same institute, he became a professor at the University of Tokyo in 2014, and has concurrently served as the Director of the RIKEN Center for Advanced Intelligence Project since 2016. His research interests include theories and algorithms of machine learning. He received the Japan Academy Medal in 2017 and the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology in 2022. He published "Machine Learning from Weak Supervision" from MIT Press in August 2022.

Closing Remarks



Masami Hagiya Director, Institute for AI and Beyond, The University of Tokyo

After receiving M.Sc. from the University of Tokyo, Masami Hagiya worked for Research Institute for Mathematical Sciences, Kyoto University, and received a Doctor of Science in 1988. He was a professor at Department of Computer Science, Graduate School of Information Science and Technology, the University of Tokyo, from 2001 to 2022. He has been working in the fields of software science and engineering, including theory of programming languages, software testing and formal verification. He is also working in the fields of natural computing (computing by natural phenomena), including DNA computing. He was appointed as the Director of Institute for AI and Beyond in April 2021.

MC



Daichi Konno Medical Doctor, The University of Tokyo Hospital

Graduated from Faculty of Medicine, the University of Tokyo in 2015. PhD in Medicine from the Graduate School of Medicine, the University of Tokyo in 2022. Affiliated with the Department of Geriatrics, the University of Tokyo Hospital, Laboratory of Chemical Pharmacology, Graduate School of Pharmaceutical Sciences, The University of Tokyo, Graduate School of Engineering, The University of Tokyo. He specializes in neuroscience, artificial intelligence, and aging. In addition to his clinical and research work, he actively disseminates the latest research trends on the brain. He is the author of 'How far can human abilities be extended if we connect the brain and artificial intelligence? The Frontiers of Brain-AI Fusion'.