Name: Kenji Doya
Position: Professor
Affiliation: Neural Computation Unit,
Okinawa Institute of Science and Technology Graduate University
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Date of birth: July 13, 1961

Education:

1980-1984	B.S., Engineering, University of Tokyo
1984-1986	M.S., Engineering, University of Tokyo
1994	Ph.D., Engineering, University of Tokyo

Professional Positions:

1986-1991	Instructor, University of Tokyo
1991-1993	Visiting Researcher, University of California, San Diego
1993-1994	Research Associate, The Salk Institute
1994-2003	Senior Researcher, Advanced Telecommunication Research Institute International (ATR)
1995-2006	Visiting Associate Professor, Nara Institute of Science and Technology (NAIST)
1996-1999	Group Leader, Dynamic Brain Project, Japan Science and Technology Corporation (JST)
2003-2011	Department Head, ATR Computational Neuroscience Laboratories
2004-2011	Principal Investigator, Okinawa Institute of Science and Technology (OIST)
2006-2015	Visiting Professor, NAIST
2010-2014	Adjunct Professor, Kyoto University
2011-	Professor, Neural Computation Unit, OIST Graduate University
2011-2014	Vice Provost for Research, OIST Graduate University
2012-2019	Scientific Technical Committee, Italian Institute of Technology

Major Research Grants:

1999-2005	Metalearning, neuromodulation and emotion, CREST, JST
2011-2016	Prediction and decision making, Kakenhi Innovative Areas, MEXT
2011-2016	Machine learning approaches for depression, SRPBS, MEXT
2011-2016	Hierarchical simulation for predictive medicine, Supercomputational Life Science, RIKEN
2014-2019	Multi-scale models using brain map data, Brain/MINDS, MEXT
2016-2020	Whole-brain simulation and brain-like artificial intelligence, Post-K Application Research & Development, MEXT
2016-2021	Artificial intelligence and brain science, Kakenhi Innovative Areas, MEXT
2019-2024	Development of data analysis methods, Brain/MINDS, AMED

Social Services:

1999-2002	Vice President, Japanese Neural Network Society (JNNS)
1999-2003	Director, Neuro-Informatics Summer School (NISS)
2004-	Co-organizer, Okinawa Computational Neuroscience Course (OCNC)
2007, 2016	Program Co-chair, International Conference on Neural Information Processing (ICONIP)
2008-2021	Co-editor in Chief, Neural Networks
2009-2011, 2021-2023	Board of Governors, International Neural Network

	Society (INNS)
2010	Program Chair, 33rd Annual Meeting of Japan Neuroscience Society
2011, 2018	Executive Chair, Annual Conference of JNNS
2020-	Co-chair, Data Standards and Sharing Working Group, International Brain Initiative
2022	President, 45th Annual Meeting of Japan Neuroscience Society (Neuro2022)

Awards:

2000, 2003, 2005, 2006	Best Paper Awards, JNNS
2007	JSPS Award, Japan Society for Promotion of Science
2007	Tsukahara Award, Brain Science Foundation
2012	MEXT Prize for Science and Technology
2013	College of Fellows, INNS
2018	Donald O. Hebb Award, INNS
2019	Academic Award, JNNS
2019	Outstanding Achievement Award, Asia Pacific Neural Network Society
2022	Age group 1st place, Ayahashi Triathlon

Representative Publications

Doya K, Ema A, Kitano H, Sakagami M, Russell S (2022). Social impact and governance of AI and neurotechnologies. *Neural Networks*.

Doya K (2021). Canonical cortical circuits and the duality of Bayesian inference and optimal control. *Current Opinion in Behavioral Sciences*, 41, 160-167.

Doya K, Miyazaki KW, Miyazaki K (2021). Serotonergic modulation of cognitive computations. *Current Opinion in Behavioral Sciences*, 38, 116-123.

Girard B, Lienard J, Gutierrez CE, Delord B, Doya K (2020). A biologically constrained spiking neural network model of the primate basal ganglia with overlapping pathways exhibits action selection. *European Journal of Neuroscience*, 53, 2254-2277.

Miyazaki K, Miyazaki KW, Sivori G, Yamanaka A, Tanaka KF, Doya K (2020). Serotonergic projections to the orbitofrontal and medial prefrontal cortices differentially modulate waiting for future rewards. *Science Advances*, 6, eabc7246.

Doya K, Taniguchi T (2019). Toward evolutionary and developmental intelligence. *Current Opinion in Behavioral Sciences*, 29, 91-96.

Miyazaki K, Miyazaki KW, Yamanaka A, Tokuda T, Tanaka KF, Doya K (2018). Reward probability and timing uncertainty alter the effect of dorsal raphe serotonin neurons on patience. *Nature Communications*, 9:2048.

Tokuda T, Yoshimoto J, Shimizu Y, Okada G, Takamura M, Okamoto Y, Yamawaki S, Doya K (2018). Identification of depression subtypes and relevant brain regions using a data-driven approach. *Scientific Reports* 8:14082.

Yoshizawa T, Ito M, Doya K (2018). Reward-predictive neural activities in striatal striosome compartments. *eNeuro*, 5(1) e0367-17.2018.

Elfwing S, Uchibe E, Doya K (2018). Sigmoid-weighted linear units for neural network function approximation in reinforcement learning. *Neural Networks* 107:3-11.

Fermin AS, Yoshida T, Yoshimoto J, Ito M, Tanaka SC, Doya K (2016). Model-based action planning involves cortico-cerebellar and basal ganglia networks. *Scientific Reports*, 6, 31378.

Funamizu A, Kuhn B, Doya K (2016). Neural substrate of dynamic Bayesian inference in the cerebral cortex. *Nature Neuroscience*, 19, 1682–1689.

Ito M, Doya K (2015). Distinct neural representation in the dorsolateral, dorsomedial, and ventral parts of the striatum during fixed- and free-choice tasks. *Journal of Neuroscience* 35:3499-3514.

Elfwing S, Doya K (2014). Emergence of polymorphic mating strategies in robot colonies. *PLoS One*, 9(4), e93622.

Miyazaki KW, Miyazaki K, Tanaka KF, Yamanaka A, Takahashi A, Tabuchi S, Doya K (2014). Optogenetic activation of dorsal raphe serotonin neurons enhances patience for future rewards. *Current Biology*, 24(17), 2033-2040.

Elfwing S, Uchibe E, Doya K, Christensen HI (2011). Darwinian embodied evolution of the learning ability for survival. *Adaptive Behavior*, 19, 101-120.

Miyazaki K, Miyazaki KW, Doya K (2011). Activation of dorsal raphe serotonin neurons underlies waiting for delayed rewards. *Journal of Neuroscience*, 31, 469-479.

Ito M, Doya K (2009). Validation of decision-making models and analysis of decision variables in the rat basal ganglia. *Journal of Neuroscience*, 29, 9861-9874.

Doya K (2008). Modulators of decision making. *Nature Neuroscience*, 11, 410-416.

Samejima K, Ueda K, Doya K, Kimura M (2005). Representation of action-specific reward values in the striatum. *Science*, 301, 1337-1340.

Tanaka SC, Doya K, Okada G, Ueda K, Okamoto Y, Yamawaki S (2004). Prediction of immediate and future rewards differentially recruits cortico-basal ganglia loops. *Nature Neuroscience*, 7(8), 887-893.

Doya K (2002). Metalearning and neuromodulation. *Neural Networks*, 15, 495-506.

Doya K (2000). Reinforcement learning in continuous time and space. *Neural Computation*, 12, 219-245.

Doya K (1999). What are the computations of the cerebellum, the basal ganglia, and the cerebral cortex. *Neural Networks*, 12, 961-974.

Doya K., Selverston A.I. (1994). Dimension reduction of biological neuron models by artificial neural networks. *Neural Computation*, 6, 696-717.

Doya K., Yoshizawa S. (1989). Adaptive neural oscillator using continuous-time

back-propagation learning. *Neural Networks*, 2, 375-386.