Prof. Dr. Masahiro Ryo

Personal Details

Position	Head of WG Artificial Intelligence Professor for Environmental Data Science Brandenburg University of Technology Cottbus-Senftenberg

Academic Education and Scientific Degrees

10/2012 – 03/2015	PhD, Civil Engineering, Tokyo Institute of Technology, Japan
04/2011 – 09/2012	MSc, Civil Engineering, Tokyo Institute of Technology, Japan
04/2007 – 03/2011	BSc, Civil & Environmental Engineering, Tokyo Institute of Technology, Japan

Professional Experience

12/2020 – ongoing	Professor for Environmental Data Science (joint appointment with ZALF), Brandenburg University of Technology Cottbus-Senftenberg, Germany
12/2020 – ongoing	Leader of Working Group “Artificial Intelligence for Smart Agriculture”, ZALF
04/2016 – 11/2020	Postdoc, Free University of Berlin, Germany
04/2015 – 03/2016	Postdoc, Federal Institute of Aquatic Science and Technology, Switzerland

Background

- Data science with artificial intelligence (AI)
- Biodiversity and ecosystem pattern analysis and knowledge synthesis
- Hydrological simulation with remote sensing

Research Activities

- Exploring AI-powered Nature-based solutions for sustainability
- AI development & application for biodiversity and agricultural research
- Agricultural digitalization and diversification strategy across scales

Functions and Memberships

2021-ongoing	Associate Editor, Journal of Sustainable Agriculture and Environment
2019-ongoing	Associate Editor, Ecological Informatics
2014-2020	Research fellow of Japan Society for the Promotion of Science

Other:

Representative for Narrative 3, Agricultural and digitalization (since 2021)

Promising young award (Suzuki award), the Ecological Society of Japan, 2020

ORCID iD: 0000-0002-5271-3446 ; h-index = 18, Citations >1700 (as of Nov 2022)

Bibliography

Masahiro Ryo obtained a Ph.D. degree in Engineering from Tokyo Institute of Technology, Japan in 2015. After a one-year postdoc at Eawag, Switzerland, he was a five-year postdoc at Freie Universität Berlin, Germany. Since 2020 He is tenure-track Professor of Environmental Data Science at Brandenburg University of Technology Cottbus-Senftenberg and Group Leader of Artificial Intelligence for Smart Agriculture at the Leibniz Centre of Agricultural Landscape Research.

Goal of the Working Group “Artificial Intelligence”

Sustainable transformation of agriculture can alleviate various global challenges, including biodiversity loss, food and water security, and climate change. To facilitate transformation, we use artificial intelligence (AI) and data science techniques for understanding and predicting complex agricultural behaviors from data. We aim to (i) understand how multiple drivers and diversity affect the resilience of nature and the society across scales, (ii) make agriculture more predictable by multimodal data synthesis. Thereby, we offer AI-powered, Nature-based Solutions for sustainability challenges.

Publications

Rillig, M.C., **Ryo, M. (co-1st author),** Lehmann, A., Aguilar-Trigueros, C.A., Buchert, S., Wulf, A., Iwasaki, A., Roy, J., Yang G. (2019). The role of multiple global change factors in driving soil functions and microbial biodiversity. Science 366:886-890.

Ryo, M., Aguilar-Trigueros, C.A., Pinek, L., Muller, L.A.H., Rillig M.C., (2019). Basic principles of temporal dynamics. Trends in Ecology & Evolution (Cell) 34:723-733.

Yang, G., **Ryo, M.**, Roy, J., Lammel, D.R., Ballhausen, M.B, Jing, X., Zhu, X., Rillig, M.C. (2022). Multiple anthropogenic pressures eliminate the effects of soil microbial diversity on ecosystem functions in experimental microcosms. Nature Communications 13:4260.

Spake, R., O'Dea, R.E., Nakagawa, S., Doncaster, C.P., **Ryo, M.**, Callaghan, C., Bullock, J.M. (in press). Improving quantitative synthesis to achieve generality in ecology. Nature Ecology and Evolution 6(12):1818-1828.

Ryo, M., Angelov, B., Mammola, S., Kass, J.M., Benito, B.M., Hartig F. (2021). Explainable artificial intelligence enhances the ecological interpretability of black-box species distribution models. Ecography 44, 2, 199-205.