

Jomar Fajardo Rabajante

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Research interest: Mathematical modeling of complex biological and social systems

Dr. Jomar Fajardo Rabajante is a faculty member of the Institute of Mathematical Sciences and Physics, UPLB since 2008. Prior to his career in UPLB, he worked at the Insular Life Assurance Co., Ltd. as part of its Corporate Planning Staff. Currently, he is the OIC-Dean of the Graduate School of UPLB from 01 November 2020. He also holds an appointment as Junior Associate at the Quantitative Life Sciences Group of the Abdus Salam International Centre for Theoretical Physics in Trieste Italy from year 2019 to 2024. He served as a research collaborator/consultant to the Asian Development Bank, United Nations Population Fund, Zuellig Family Foundation, World Vision, PhilRice, and Province of Bataan in modeling the dynamics of infectious diseases. As part of his advocacy in promoting quantitative sciences to the Filipino community, he created education modules for DOST-SEI STEM activities, and was interviewed by various news agencies. He is a reviewer of several international and local journals and grants, and he is one of the young mathematicians in the Philippines with a two-digit H-index.

Dr. Rabajante obtained his Doctor of Science degree from Shizuoka University Japan as a Japanese Government Monbukagakusho scholar, and M.Sc. in Applied Mathematics degree from the University of the Philippines Diliman as a DOST scholar. He completed a Higher Education Teaching Certificate from the Derek Bok Center for Teaching and Learning in Harvard University, and holds a Professional Certificate in Online Education from the University of Wisconsin-Madison. He was a Visiting Professor at the Biology Department of Carleton University in Canada, Visiting Researcher at the Max Planck Institute for Evolutionary Biology in Germany, and Visiting Scientist at the Fields Institute for Research in Mathematical Sciences in Canada. He attended research schools on mathematical epidemiology at the Department of Infectious Disease Epidemiology in St. Mary's Hospital, Imperial College London, and on systems biology at Ohio State University.

Dr. Rabajante is one of the proponents and the co-chair for program implementation of the first and only PhD Applied Mathematics degree program in the Philippines. He is instrumental in the revision of the MS Mathematics program of UPLB to include a track in Applied Mathematics. Some of his administrative positions held in the UP System include: (i) OIC-Dean of the UPLB Graduate School; (ii) Program Chair of the Diploma in Mathematics Teaching program and a member of the Executive Committee of the Faculty of Education, UPOU; (iii) Head of the Mathematics Division, IMSP, UPLB; (iv) Chair of the UPLB Graduate School Committee on Physical Sciences, and a member of the GAAC; (v) IMSP Coordinator for Research and Extension; and (vi) founder and coordinator of the UPLB Biomathematics Team which won the 2019 CAS Outstanding Research Team. He is also a fellow of the UP Resilience Institute, and a lead researcher of the UP COVID-19 Pandemic Response Team. Dr. Rabajante is currently a member at large of the National Research Council of the Philippines (NRC) Governing Board.

Academic Degrees/Educational Background:

- Doctor of Science [Mathematical and Systems Engineering - Environment and Energy Systems], Class 2016 Shizuoka University (National University), Hamamatsu City, Shizuoka, Japan
- Master of Science in Applied Mathematics [Math in Life and Physical Sciences], Class 2012 Institute of Mathematics, UP Diliman
- Bachelor of Science in Applied Mathematics [Operations Research], Class 2006 Mathematics Division, Institute of Mathematical Sciences and Physics, UPLB
- Don Bosco High School, Sta. Cruz, Laguna, Class 2001

Selected Publications, Policy Brief and Authored Digital Tools:

- Raitzer D.A., Lavado R.F., Rabajante J.F., et al. 2020. Cost-benefit analysis of face-to-face closure of schools to control COVID-19 in the Philippines. *ADB Briefs*. DOI: 10.22617/BRF200405-2. <https://www.adb.org/publications/cost-benefit-analysis-closure-schools-covid-19-philippines>
- Buhat C.A.H., Rabajante J.F. and Paller V.G.V. 2020. Spatiotemporal modeling of parasite aggregation among fish hosts in a lentic ecosystem. *Modeling Earth Systems and Environment*. DOI: 10.1007/s40808-020-00983-8. Publisher: Springer
- Dy L.F. and Rabajante J.F. 2020. A COVID-19 infection risk model for frontline health care workers. *Network Modeling Analysis in Health Informatics and Bioinformatics*, 9: 57. Publisher: Springer
- Verano K.V.B. and Rabajante J.F. 2019. Sustainability of nonlinear consumption schemes in resource dynamics with Allee and crowding effects. *Sustainable Production and Consumption*, 20: 192-206. Publisher: Elsevier
- Rabajante J.F. and del Rosario R.CH. 2019. Modeling long ncRNA-mediated regulation in the mammalian cell cycle. Chapter 17 in *Computational Biology of Non-Coding RNA: Methods and Protocols* (Methods in Molecular Biology vol. 1912), pp. 427-445. Publisher: Humana Press (Springer Nature)
- Anzia E.L. and Rabajante J.F. (corresponding author). 2018. Antibiotic-driven escape of host in a parasite-induced Red Queen dynamics. *Royal Society Open Science*, 180693. Publisher: The Royal Society of London
- Gavina M.K.A., Aoki K., Rabajante J.F. et al. 2018. Long-term persistence of agricultural pest insects by risk-spreading dispersal. *Ecological Research*. DOI: 10.1007/s11284-018-1615-z. Publisher: Wiley/Springer
- Cortez M.J.V., Rabajante J.F. (corresponding author), Tubay J.M. and Babierra A.L. 2017. From epigenetic landscape to phenotypic fitness landscape: Evolutionary effect of pathogens on host traits. *Infection, Genetics and Evolution*, 51: 245-254. Publisher: Elsevier
- Rabajante J.F., Tubay J.M., Ito H., Uehara T., Kakishima S., Morita S., Yoshimura J. and Ebert D. 2016. Host-parasite Red Queen dynamics with phase-locked rare genotypes. *Science Advances*, 2(3): e1501548. Publisher: American Association for the Advancement of Science (AAAS). <http://advances.sciencemag.org/content/2/3/e1501548>
- Jatulan E.O., Rabajante J.F., Banaay C.G.B., Fajardo A.C. Jr. and Jose E.C. 2015. A mathematical model of intra-colony spread of American Foulbrood in European honeybees (*Apis mellifera* L.). *PLoS ONE*, 10(12): e0143805. Publisher: Public Library of Science
- Rabajante J.F., Tubay J.M., Uehara T., Morita S., Ebert D. and Yoshimura J. 2015. Red Queen dynamics in multi-host and multi-parasite interaction system. *Scientific Reports*, 5: 10004. Publisher: Nature Publishing Group. <http://www.nature.com/articles/srep10004>
- Rabajante J.F. and Babierra A.L. 2015. Branching and oscillations in the epigenetic landscape of cell-fate determination. *Progress in Biophysics & Molecular Biology*, 117: 240-249. Publisher: Elsevier
- Gavina M.K.A., Rabajante J.F. (corresponding author) and Cervancia C.R. 2014. Mathematical programming models for determining the optimal location of beehives. *Bulletin of Mathematical Biology*, 76(5): 997-1016. Publisher: Springer
- COVID-19 Job Risk Calculator, Workplace Outbreak Microsimulator, Event R Calculator, Projections. Links: <https://datastudio.google.com/s/n2gb16MnV6w> and <https://endcov.ph/projections>
- GlycoLINC Network Toolbox. Link: <https://glicnt.weebly.com>

Selected Awards and Funding Grants:

- 2 UP System Enhanced Creative Work and Research Grants (ECWRG)
- UP System grant for COVID-19 modeling and data analytics (under the UP Resilience Institute)
- International Foundation for Science (IFS) collaborative research grant (where the Team AQUASafe is bestowed with Professor Carolina MacGillavry Collaborative Research Award via the Royal Netherlands Academy of Arts and Sciences for being a top ranked application to IFS)
- Philippine-California Advanced Research Institutes (PCARI) grant: Glycoproteomics of Filipino Lung Cancer Cell Lines for Biomarker Discovery and Anti-Cancer Screening of Natural Products (co-project leader)
- Abdus Salam International Centre for Theoretical Physics Associateship Scheme grant
- One UP Professorial Chair for Teaching and Research (2019 – 2021)
- UP Scientific Productivity System Award (UP Scientist 1 from 2017-2019, submitted application for promotion to UP Scientist 3)
- 2019 ASEAN Science Diplomat
- 2nd Prize Winner, 2016 Talent Search for Young Scientists, NAST
- 2012 UPLB Outstanding Mathematics Instructor
- Dean's Award, Graduate School of Science and Technology, Shizuoka University
- Jury's Choice Poster award, Hands-on Research in Complex Systems School, ICTP Italy
- Nominee, The Outstanding Young Men, JCI Philippines