

Sungsik Kong | Curriculum Vitæ

Department of Evolution, Ecology, and Organismal Biology – The Ohio State University
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Summary

- Ph.D. in Evolution, Ecology, and Organismal Biology (EEOB), The Ohio State University
- Presidential Fellow, The Ohio State University
- Research focus: Phylogenetic methods, computational biology

Professional Experience

Department of Electrical and Computer Engineering

University of California San Diego, CA., USA

Mentors: Profs. Drs. Siavash Mir Arabbaygi and Vineet Bafna

2023–Present

Postdoctoral Scholar

Education

Ph.D. in Evolution, Ecology, and Organismal Biology

2018–2022

The Ohio State University, Columbus, OH., USA

Dissertation: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories

Advisor: Prof. Dr. Laura Kubatko

M.Sc. in Ecology and Evolutionary Biology

2013–2015

University of Toronto, Toronto, ON., Canada

Thesis: On the use of Median-Joining networks: A philosophical and empirical evaluation of its suitability in evolutionary biology

Advisor: Prof. Dr. Robert Murphy

B.Sc. in Zoology and Ecology and Evolutionary Biology

2006–2012

University of Toronto, Toronto, ON., Canada

Publications

Total number: 16

h-index: 7 [Google scholar]

Peer-reviewed journal articles.....

‡Co-correspondence; †Equal contribution

- [16] Glon H, Häussermann V, Brewin P, Brickle P, **Kong S**, Smith M, and Daly M. (In Press) There and back again: The unexpected journeys of *Metridium* de Blainville, 1824 between the old oceans and throughout the modern world. *Biological Bulletin*
- [15] Nguyen HQ, Ho P-T, **Kong S**, Bae Y, Pham TH, and Jang Y. (2022) A time-calibrated mitogenomic phylogeny suggests that Korean *Hyalessa fuscata* is a bridge between Chinese and Japanese *H. maculaticollis*. *Journal of Genetics* 102:9 doi:10.1007/s12041-022-01405-7
- [14] **Kong S** (2022) Digest: Frequent hybridization in *Darevskia* rarely leads to the evolution of asexuality. *Evolution* 76:9 2216–2217 doi:10.1111/evo.14587
- [13] Nguyen HQ, Kim E, Bae Y, Chae S, Ji S, Heo J, **Kong S**, Nguyen TK, Pham TH, and Jang Y. (2022) An effective method for accurate life-stage delimitation of cicadas. *Journal of Asia-Pacific Entomology* 101952 doi:10.1016/j.aspen.2022.101952
- [12] **Kong S**[†], Pons JC[†], Kubatko LS, and Wicke K. (2022) Classes of phylogenetic networks and their mathematical and biological significance. *Journal of Mathematical Biology* 84:47 doi:10.1007/s00285-022-01746-y
- [11] Glon MG, Broe MB, Crandall KA, Daly M, **Kong S**, Thoma RF, and Freudenstein JV. (2022) Anchored hybrid enrichment resolves the *Lacunicambarus* (Decapoda: Cambaridae) phylogeny. *Journal of Crustacean Biology* 42:1 ruab073 doi:10.1093/jcbiol/ruab073
- [10] **Kong S** and Kubatko LS. (2021) Comparative performance of popular methods for hybrid detection using genomic data. *Systematic Biology* 70:5 891–907 doi:10.1093/sysbio/syaa092
- [9] Sánchez-Pacheco SJ[‡], **Kong S**[‡], Pulido-Santacruz P, Murphy RW, and Kubatko L. (2020) Median-joining network analysis of SARS-CoV-2 genomes is neither phylogenetic nor evolutionary. *Proc. Natl. Acad. Sci. U.S.A* 117:23 12518–12519 doi:10.1073/pnas.2007062117
- [8] Kim M, Nguyen HQ, Yi Y, Ahn J, Kim YE, Jang S, Kim S, **Kong S**, and Borzée A. (2020) Policy recommendation on whaling, trade and watching of cetaceans in the Republic of Korea. *Biodiversity Journal* 11: 255–258 doi:10.31396/Biodiv.Jour.2020.11.1.255.258

- [7] Weiringa JG, Boot MR, Dantas-Queiroz MV, Duckett D, Fonseca EM, Glon H, Hamilton N, **Kong S**, Lanna FM, Mattingly KZ, Parsons DJ, Smith ML, Stone BW, Thompson C, Zuo L, and Carstens BC. (2020) Does habitat stability structure intraspecific genetic diversity? It's complicated... *Frontiers in Biogeography* e45377 doi:10.21425/F5FBG45377
- [6] Borzée A, Purevdorj Z, Kim YI, **Kong S**, Choe M, Yi Y, Kim K, Kim A, and Jang Y. (2020) Breeding preferences in the Treefrogs *Dryophytes japonicus* (Hylidae) in Mongolia, the northern limit of their range. *Journal of Natural History* 53: 2685-2698 doi:10.1080/00222933.2019.1704458
- [5] Groffen J, **Kong S**, Jang Y, and Borzée A. (2019) The invasive American bullfrog (*Lithobates catesbeianus*) in the Republic of Korea: history and recommendation for population control. *Management of Biological Invasions* 10:3 517–535 doi:10.3391/mbi.2019.10.3.08
- [4] Bae Y, **Kong S**, Yi Y, Jang Y, and Borzée A. (2019) Additional new type of threat to *Hynobius* salamander eggs: predation by loaches (*Misgurnus* sp.) in agricultural wetlands. *Animal Biology* 69:4 451–461 doi:10.1163/15707563-20191070
- [3] Borzée A, **Kong S**, Didinger C, Nguyen HQ, and Jang Y. (2018) A ring-species or a ring of species? Phylogenetic relationship between two treefrog species around the Yellow Sea: *Dryophytes suweonensis* and *D. immaculatus*. *The Herpetological Journal* 28: 160–170
- [2] Kim K, **Kong S**, Kim YI, Borzée A, Bae Y, and Jang Y. (2018) Japanese hard ticks (*Ixodes nipponensis*) parasitizing on the endangered leopard cat (*Prionailurus bengalensis euptilura*) in the Republic of Korea. *Animal Systematics, Evolution and Diversity* 34:1 23–26 doi:10.5635/ASED.2018.34.1.032
- [1] **Kong S**[†], Sánchez-Pacheco S[†], and Murphy RW. (2016) On the use of Median-Joining Networks in evolutionary biology. *Cladistics* 32: 691–699 doi:10.1111/cla.12147

Policy recommendations.....

- [1] Borzée A, Nguyen HQ, Ahn J, Kim M, Kim S, Jang S, **Kong S**, Kim YE, and Yi Y. (2017) Policy recommendation on the negative impact of infrastructure development on the population of endangered Long-Tailed Goral in Oseck-Kkeutchong. *Society for Conservation Biology Korean Chapter*

Submitted.....

- [3] **Kong S**, Swofford DL, and Kubatko LS. (In Review) Inference of phylogenetic networks from sequence data using composite likelihood. Preprint available on *bioRxiv* at 10.1101/2022.11.14.516468v1
- [2] **Kong S**, Sánchez-Pacheco SJ, and Murphy RW. (In Review) Topological incongruence between median-joining networks and Bayesian inference phylogenies. Preprint available on *bioRxiv* at 10.1101/2022.10.01.510440
- [1] Fu M, Eimes JA, **Kong S**, Lamichhaney S, and Waldman B. (In Review) Chytrid-resistant genotypes arise from multiple mutations.

Presentations

*Virtual presentation

Invited talks.....

- [11] **Algorithms and Complexity in Phylogenetics*** 2022
Title: Inferring phylogenetic networks from sequence data using composite likelihood
Video recording available on YouTube [link]
- [10] **Indiana University, Bloomington, IN., USA** 2022
Dr. Matthew Hahn laboratory
Title: Towards the Network of Life: Phylogenetic networks as a tool to understand complex evolutionary histories
- [9] **University of California San Diego, CA., USA*** 2022
Drs. Siavash Mir Arabbaygi and Vineet Bafna laboratory
Title: Towards the Network of Life: Phylogenetic networks as a tool to understand complex evolutionary histories
- [8] **Evolution Meeting, Cleveland, OH., USA** 2022
Society of Systematic Biologists (SSB) Ernst Mayr award competition
Title: Inferring phylogenetic networks using composite likelihood directly from sequence data
- [7] **Louisiana State University, Baton Rouge, LA., USA** 2022
Dr. Jeremy Brown laboratory and Department of Biological Sciences
Title: Inferring phylogenetic networks using composite likelihood directly from sequence data
- [6] **The Korean Association of Biological Sciences, Seoul, South Korea*** 2021
The Ecological Society of Korea Section
Title: Comparative performance of popular methods for hybrid detection using genomic data
- [5] **Workshop in Mathematical and Computational Biology*** 2021
Bioinformatics Section
Title: Comparative performance of popular methods for hybrid detection using genomic data
- [4] **Misericordia University, Dallas, PA., USA*** 2021
Biology Seminar Series
Title: How my gap year changed my perspectives
- [3] **The Stone Laboratory, Gibraltar Island, OH., USA** 2019
EEOB 1930 Introduction to Biological Studies–Aquatic Biology
Title: Phylogenetic networks and behavioral evolution of Primates
- [2] **Ewha Womans University, Seoul, South Korea** 2016
Eco-science/Eco-creative Graduate Seminar
Title: On the use of Median-Joining network

- [1] **Ewha Womans University, Seoul, South Korea** 2013
Laboratory of Behavior and Ecology Weekly Seminar
 Title: The evolution of infanticide and male takeover in primates in a macroevolutionary framework

Regular talks.....

- [6] **Evolution Meeting*** 2021
 Title: Comparative performance of popular methods for hybrid detection using genomic data
- [5] **The Ohio State University, Columbus, OH., USA*** 2021
EEOB Annual Darwin Series
 Title: Comparative performance of popular methods for hybrid detection using genomic data
- [4] **The Ohio State University, Columbus, OH., USA** 2020
Evolution & Ecology Club
 Title: Which tool to use to detect hybridization?
- [3] **SSB Standalone Meeting, Gainesville, FL., USA** 2020
 Title: Comparison and evaluation on the accuracy of popular hybrid detection methods using simulated data
- [2] **The Ohio State University, Columbus, OH., USA** 2019
Evolution & Ecology Club
 Title: The giving tree: how the branching pattern of a tree is used in evolutionary biology
- [1] **Ewha Womans University, Seoul, South Korea** 2017
Animal Communication Symposium
 Title: Illustrating hybridization

Poster presentations.....

- [5] **Intelligent Systems for Molecular Biology (ISMB),
 The International Society for Computational Biology (ISCB), Madison, WI., USA** 2022
Best Poster Award Winner
 Title: Inference of phylogenetic networks from sequence data using composite likelihood
- [4] **Evolution Meeting, Providence, RI., USA** 2019
 Title: Performance and accuracy of Median-Joining Networks and comparisons with Bayesian phylogenies
- [3] **The Korean Association of Biological Sciences, Yong-In, South Korea** 2017
 Title: Performance and accuracy of Median-Joining Networks and comparisons with Bayesian phylogenies
- [2] **Korean-American Scientists and Engineers Association (KSEA)
 Young Generation Technical and Leadership Conference (YGTLC), Houston, TX., USA** 2014
 Title: Matrilineal relationships of green pitvipers with the description of a new species of the genus *Trimeresurus* (Squamata: Viperidae: Crotalinae) from the central highlands of Vietnam
- [1] **University of Toronto, Toronto, ON., Canada** 2012
Department of Ecology and Evolutionary Biology undergraduate research Fair
 Title: The evolution of infanticide and male takeover in primates in a macro- evolutionary framework

Academic Experience

University of Wisconsin–Madison, WI., USA 2022
Wisconsin Institute for Discovery Visiting Ph.D. student
Mentor: Prof. Dr. Claudia Solis-Lemus

Louisiana State University, Baton Rouge, LA., USA 2022
Department of Biological Sciences Visiting Ph.D. student
Mentor: Prof. Dr. Jeremy Brown

The Ohio State University, Columbus, OH., USA 2018–2021
Department of Evolution, Ecology, and Organismal Biology Graduate associate

Ewha Womans University, Seoul, South Korea 2016–2017
Division of Eco-science Researcher
Mentor: Prof. Dr. Yikweon Jang

University of Toronto, ON., Canada 2013–2015
Department of Ecology and Evolutionary Biology Graduate associate

Ewha Womans University, Seoul, South Korea 2013
Division of Eco-science Student researcher
Mentor: Prof. Dr. Jae Chun Choe

University of Toronto, ON., Canada 2011–2013
Faculty of Forestry Work-Study student
Mentor: Prof. Dr. Sandy Smith and Eric Davies Biodiversity technician

Royal Ontario Museum, Toronto, ON., Canada 2012
Centre for Biodiversity and Conservation Biology Student researcher
Mentor: Prof. Dr. Robert Murphy

University of Toronto, ON., Canada 2011–2012
Department of Ecology and Evolutionary Biology Student researcher
Mentor: Prof. Dr. Deborah McLennan

University of Toronto, ON., Canada 2010
Cities Centre, Department of Geography Student data collector

Fieldwork experience.....

- South Korea, Mongolia, and China 2017
- Indonesia, Laos, and South Korea 2016
- Greater Toronto Area (GTA) 2010–2013

Teaching and Mentoring Experience

The Ohio State University.....

Teaching assistant

- *EEOB 3310* Evolution (Spring, Fall) 2021
(Spring, Summer, Fall) 2020
(Spring, Fall) 2019
- *EEOB 2520* Human Physiology (Summer) 2021
- *EEOB 1930* Introduction to Biological Studies–Aquatic Biology (Summer) 2019
- *BIOL 1113* Energy Transformation and Development (Fall) 2018

University of Toronto.....

Teaching assistant

- *BIO 120* Adaptation and Biodiversity (Summer) 2015
(Summer) 2014
(Fall) 2013
- *BIO 220* From Genomics to Ecosystems in a Changing World (Spring) 2015
- *EEB 362* Macroevolution (Fall) 2014
- *EEB 386* Avian Biology (Spring) 2014

Miscellaneous.....

- Daruma Eco-Farm, Bang Phra, Si Racha District, Chon Buri, Thailand 2016
- Cheong-Shim International English Camp, Ga-Pyeong, South Korea 2009

(Co-)supervision of undergraduate students.....

- Alanna Kong 2021–2022
Undergraduate student at University of Toronto
University of Toronto Woodsworth Mentorship Program
- Devansh Pandey 2021–2022
Undergraduate student at Indian Institute of Technology Kharagpur,
Current graduate student at University of Texas at Austin
Científico Latino
- McKenna Molnar 2020–2021
Graduate student at The Ohio State University
EEOB Graduate Mentoring Program, The Ohio State University, OH., USA
- Shelby Jansens and Kimberly Wiles 2020
Co-supervised with Dr. Laura Kubatko
Mathematical Biosciences Institute Research Experiences for Undergraduates program
Title: Detecting shifts in the evolutionary process in SARS-CoV-2 genomes
- Tulio Soares and Ellen Southam 2014–2015
Co-supervised with Dr. Pedro Bernardo
University of Toronto and Royal Ontario Museum
- Shreeram Senthivasan 2014
Co-supervised with Drs. Pedro Bernardo, Santiago Sánchez-Pacheco, and Robert Murphy
University of Toronto and Royal Ontario Museum

Conference and Workshop Participation

*Virtual event

Bolds state particular role in the event; participant if unstated

- **Technical Moderator** 2022
ISMB, ISCB, Madison, WI., USA
- **Symposium Organizer (co-organized with Md Rejuan Haque)** 2022
Evolution Meeting, Cleveland, OH., USA
Symposium title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories.
- Workshop in Mathematical and Computational Biology* 2022
- Annual Conference of the Korean Association of Biological Sciences, South Korea* 2021
- iEvoBio (Informatics for Phylogenetics, Evolution and Biodiversity), Evolution Meeting* 2021
- **Chair/Moderator** in multiple Faux-Live Sessions, Evolution Meeting* 2021
- Workshop in Mathematical and Computational Biology* 2021
- SMRT Leiden 2021 – Young Investigator Virtual Conference, hosted by Pacific Biosciences and Leiden University Medical Center* 2021
- Virtual Asilomar 2021, American Society of Naturalists* 2021
- Future of Systematics Workshop, SSB Standalone Meeting, funded by NSF, hosted by Dr. Emily Sessa, University of Florida, Gainesville, FL., USA 2020
- SSB Standalone Meeting, Gainesville, FL., USA 2020
- Evolution Meeting, Providence, RI., USA 2019
- Midwest Phylogenetics Workshop, Itasca Biological Station, funded by NSF, hosted by Dr. Emma Goldberg, University of Minnesota, MN., USA 2019
- Annual Conference of the Korean Association of Biological Sciences, Yong-In, South Korea 2017
- Society for Conservation Biology (SCB) Asia Section Workshop on Conservation policy, funded by SCB, Bangkok, Thailand 2017
- World Congress of Herpetology, Hangzhou and Tonglu, China 2016
- Phylogenomics Symposium and Software School, funded by NSF, hosted by Dr. Tandy Warnow, University of Illinois at Urbana-Champaign and University of Michigan, Ann Arbor, MI., USA 2015
- SSB Standalone Meeting, University of Michigan, Ann Arbor, MI., USA 2015

Diversity and Inclusion Activities

- International Mixer, Evolution Meeting, Cleveland, OH., USA 2022
- **Moderator** International Mixer, Evolution Meeting* 2021
- **Moderator** Decolonizing Evolution Workshop, Evolution Meeting* 2021
- Transformative Justice within Academia: A radical institutional reflection, The Centre for Criminology and Sociolegal Studies Graduate Student Conference, University of Toronto* 2021
- **Moderator** Strategies for Responding to Harassment and Bullying: Improving Workplace Climate, Evolution Community Resources for Early Career Researchers 2020 (ECR²)* 2020
- **Moderator** Fireside ECR Chat, ECR²* 2020

Grants and Awards

All in US Dollars unless stated. †Canadian Dollar; ‡Approximately converted from South Korean Won

- 2022 EvolCompGen Best Poster Award, ISMB, ISCB \$100
- 2022 EEOB Graduate Development Grant, The Ohio State University Funded
- 2022 EEOB Graduate Evolution & Ecology Student Organization (GEES) Career Development Grant, The Ohio State University \$200
- 2022 Council of Graduate Students (CGS) Career Development Grant, The Ohio State University \$350
- 2022 The Presidential Fellowship, The Ohio State University \$36,500
- 2021 SSB Ad Hoc Funds \$3,000
- 2021 EEOB Darwin Talk Society Membership Grant, The Ohio State University \$70
- 2021 EEOB Graduate Development Grant, The Ohio State University Funded
- 2020 SSE Graduate Research Excellence Grant – R.C. Lewontin Award competition \$1,800
- 2020 Funding for participation in Future of Systematics Workshop, SSB Standalone Meeting (NSF) \$500
- 2019 Funding for participation in Midwest Phylogenetics Workshop (NSF) Funded
- 2019 EEOB Graduate Development Grant, The Ohio State University Funded
- 2017 Major contribution to successful grant application to National Research Foundation of Korea (2-2017-0410-001-1) PI: Dr. Yikweon Jang, Ewha Womans University, Seoul, South Korea ‡\$500,000
- 2013–2015 University of Toronto Graduate Fellowship Funded
- 2014 E.M. Walker Graduate Award in Biodiversity, University of Toronto †\$2,615
- 2010–2012 University of Toronto Undergraduate Bursaries †≈\$3,000

Outreach and Service

- **Awardee** Graduate School Awards Ceremony, The Ohio State University, Columbus, OH., USA 2022
- **Invited Panelist** EEOB 8894: EEOB Graduate Seminar, The Ohio State University, OH., USA 2020
- **Invited Guest** Translational Data Analytics Institute Kickoff Event, College of Arts and Sciences, The Ohio State University, OH., USA 2020
- **Volunteer** Museum of Biological Diversity's Open House, The Ohio State University, OH., USA 2019
- Graduate Studies Committee Department of EEOB, The Ohio State University, OH., USA 2020–2021
- Admissions Committee Department of EEOB, The Ohio State University, OH., USA 2019–2020
- Communication Officer Society for Conservation Biology (SCB), South Korean Chapter 2016–2017
- **Volunteer Biologist** Kuang Si Butterfly Park, Ban Thapene, Luang Prabang District, Laos 2016

Peer-Review Activities

- Systematic Biology
- Molecular Biology and Evolution
- Genome Biology and Evolution
- Molecular Phylogenetics and Evolution
- Scientific Reports
- Infection, Genetics and Evolution

Professional Memberships

- Society of Systematic Biologists
- Society for Study of Evolution
- International Society for Computational Biology

Skills

Programming UNIX, R, Python, Julia, HTML, JavaScript

Typesetting \LaTeX , R Markdown, Jupyter Notebook

Languages English (Fluent), Korean (Native), Japanese (Intermediate)

References

- [1] **Prof. Dr. Laura S. Kubatko (Ph.D. advisor)**
Department of Statistics and Department of Evolution, Ecology, and Organismal Biology
The Ohio State University
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Department of Natural History-Royal Ontario Museum
And Professor of Ecology and Evolutionary Biology
University of Toronto
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- [3] **Prof. Dr. Deborah A. McLennan (B.Sc. advisor)**
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University of Toronto,
25 Harbord St.
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- [4] **Prof. Dr. Bryan C. Carstens**
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And Tetrapod Division, Museum of Biological Diversity
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- [5] **Prof. Dr. Jeremy M. Brown**
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