

Josef C Uyeda

CURRICULUM VITAE

Department of Biological Sciences

Virginia Tech • 926 West Campus Dr • Blacksburg, VA 24061

503.559.6433 • juyeda@vt.edu

www.uyedalab.com

Academic employment

Virginia Polytechnic Institute and State University, Blacksburg, VA (2017-Present)

Assistant Professor, Department of Biological Sciences

University of Idaho, Moscow, ID (2012-2017)

Postdoctoral Fellow, Institute for Bioinformatics and Evolutionary Studies (IBEST)

Supervisor: Prof. Luke J. Harmon

Education

Oregon State University, Corvallis, OR (2006-2012)

Ph.D. in Evolutionary Biology. Dissertation Title: *Connecting microevolutionary processes with macroevolutionary patterns across space and time.*

Advisor: Prof. Stevan J Arnold

Willamette University, Salem, OR (2002-2006)

B.A. with honors, *summa cum laude*, Major: Biology, Minor: Chemistry

Thesis advisors: Susan Kephart & Robert Drewes (California Acad. Of Sci.)

Publications

Uyeda, JC, Bone, N, McHugh, SW, Rolland, J, and MW Pennell. *Submitted. How should functional relationships between metabolic rate and body temperature be measured at macroevolutionary scales?* *Evolution*.

Cloyed, CS, Grady, J, Savage, V, **Uyeda, JC** and AI Dell. *In review.* The allometry of animal locomotion. *Ecology*.

Farallo, VR, Munoz, MM, **Uyeda, JC** and DB Miles. 2020. Scaling between macro- to microscale climatic data reveals strong phylogenetic inertia in niche evolution in plethodontid salamanders. *Evolution*, 74(5):979-991.

Tarasov, S, Miko, I, Yoder, MJ and **JC Uyeda**. 2019. Paramo pipeline: Reconstructing ancestral anatomies using ontologies and stochastic mapping. *Insect Systematics and Diversity*, 3(6), doi:10.1093/isd/ixz009

Mabee, PM, Dahdul, WM, Balhoff, JP, Lapp, H, Manda, P, **Uyeda, JC**, Vision, TJ and M Westerfield. 2018. Phenoscape: Semantic analysis of organismal traits and genes yields insights in evolutionary biology. In: *Application of Semantic Technologies in Biodiversity Science*, edited by A. Thessen. IOS Press, Berlin.

- Uyeda, JC**, Zenil-Ferguson, R and MW Pennell. 2018. Rethinking phylogenetic comparative methods. *Systematic Biology* 67(6):1091-1109.
- Zanne, AE, Pearse, WD, Cornwell, WK, McGlenn, DJ, Wright, IJ and **JC Uyeda**. 2018. Functional biogeography of angiosperms: life at the extremes. *New Phytologist* (4):1697-1709.
- Boucher, FC, Demery, V, Conti, E, Harmon, LJ and **JC Uyeda**. 2017. A general model for estimating macroevolutionary landscapes. *Systematic Biology*, 67(2):304-319.
- Hagey, TJ, **Uyeda, JC**, Crandell, KE, Cheney, JA, Autumn, K and LJ Harmon. 2017. Tempo and mode of performance evolution across multiple independent origins of adhesive toe pads in lizards. *Evolution*, 71(10):2344-2358.
- Uyeda, JC**, Pennell, MW, Miller, ET, Maia, R and CT McClain. 2017. The evolution of energetic scaling across the vertebrate tree of life. *The American Naturalist*, 190 (2): 185-199.
- Uyeda, JC**, Harmon, LJ and CE Blank. 2016. A comprehensive study of cyanobacterial morphological and ecological evolutionary dynamics through deep geologic time preserved in the genomes of modern taxa. *PLoS ONE* 11(9): e0162539. doi:10.1371/journal.pone.0162539.
- Uyeda, JC**. 2016. Quantitative genetics of evolutionary divergence and diversification. In: *The Encyclopedia of Evolutionary Biology, 1st Edition*, edited by Richard Kliman. Academic Press.
- Uyeda, JC**, Caetano, DS, and MW Pennell. 2015. Statistical and conceptual challenges to the comparative analysis of principal components. *Systematic Biology*, 64 (4): 677-689.
- Uyeda, JC**, and LJ Harmon. 2014. A novel Bayesian method for inferring and interpreting the dynamics of adaptive landscapes from phylogenetic comparative data. *Systematic Biology*, 63(6):902-918.
- Pennell, MW, Eastman, JM, Slater, GJ, Brown, JW, **Uyeda, JC**, Fitzjohn, RG, Alfaro, ME and LJ Harmon. 2014. geiger v2.0: an expanded suite of methods for fitting macroevolutionary models to phylogenetic trees. *Bioinformatics*, doi:10.1093/bioinformatics/btu181.
- Pennell, MW, Harmon, LJ and **JC Uyeda**. 2014. Speciation is unlikely to drive divergence rates. *Trends in Ecology and Evolution*, 29(2):72-3.
- Pennell, MW, Harmon, LJ and **JC Uyeda**. 2013. Is there room for punctuated equilibrium in macroevolution? *Trends in Ecology and Evolution*, 29(1):23-32.
- Jones, AG, Bürger, R, Arnold, SJ, Hohenlohe, PA and **JC Uyeda**. 2012. The effects of stochastic and episodic movement of the optimum on the evolution of the G-matrix and the response of the mean to selection. *Journal of Evolutionary Biology*, 25(11):2210-2231.
- Eddy, SL, Kiemnec-Tyburczy, KM, **Uyeda, JC** and LD Houck. 2012. The influence of sequential male courtship behaviors on courtship success and duration in a terrestrial salamander, *Plethodon shermani*. *Ethology*, 118(12):1240-1250.
- Uyeda, JC**, Hansen TF, Arnold SJ and J Pienaar. 2011. The million-year wait for macroevolutionary bursts. *Proceedings of the National Academy of Sciences*, 108(38):15908-15913.
- Westphal, MF, Morey, SR, **Uyeda, JC**, and Morgan, TJ. 2011. Molecular phylogeny of the subfamily Amphistichinae (Teleostei: Embiotocidae) reveals a convergent loss of red pigmentation in two rapidly evolving lineages of sand-dwelling surfperch. *Journal of Fish Biology* 79:313-330.
- Uyeda, JC**, Arnold, SJ, Hohenlohe, PA, and LS Mead. 2009. Drift promotes speciation by sexual selection. *Evolution* 63(3):583-594.

Uyeda, JC, Drewes, RC, and BM Zimkus. 2007. The California Academy of Sciences Gulf of Guinea Expeditions (2001, 2006) VI. A new species of *Phrynobatrachus* from the Gulf of Guinea islands and a reanalysis of *Phrynobatrachus dispar* and *P. feae* (Anura: Phrynobatrachidae). *Proceedings of the California Academy of Sciences*, 58(18):367-385.

Uyeda, JC, and SR Kephart. 2007. Detecting species boundaries and hybridization in *Camassia quamash* and *C. leichtlinii* (Agavaceae) using allozymes. *Systematic Botany*, 31(4):642-655.

Grants and Fellowships

- 2019 CAREER: Integrating causal evolutionary processes into phylogenetic comparative biology (*Recommended for funding, PI*). NSF Systematics and Biodiversity Science (\$981,487).
- 2017 Enabling machine actionable semantics for comparative analyses of trait evolution (Co-PI). *NSF Advancing Biological Infrastructure* (\$172,356).
- 2011 Outreach Grant (Co-PI S. Eddy, \$800) Darwin's Legacy Workshop Society for the Study of Evolution
- 2011 Outreach Grant (Co-PI S. Eddy, \$800) Darwin's Legacy Workshop Precollege Programs, Oregon State University
- 2010 Doctoral Dissertation Improvement Grant (\$14,961, Co-PI S.J. Arnold) National Science Foundation (Award No. 1011352)
- 2010 Outreach Grant (\$1000; Co-PI S. Eddy), Darwin's Legacy Workshop Precollege Programs, Oregon State University
- 2009 Nordic research supplement (~\$20,000; Co-Sponsors T.F. Hansen and T. Schweder) NSF/ Research Council of Norway (Project No. 194945/V11)
- 2009 Zoology Research Fund, Oregon State University (\$500)
- 2007 Predoctoral Fellowship, National Science Foundation (\$130,500)

Teaching Experience

- 2020 Phylogenetic comparative analysis of integrated anatomical traits, SSB Workshop. SSB 2020, Gainesville, FL
- 2019 Nantucket Developer Workshop, UMASS Nantucket Field Station, Nantucket, MA.
- 2019 Semantic Comparative Analysis of Trait Evolution Workshop, Providence, RI.
- 2019 Evolutionary Biology, BIOL2704, Virginia Tech, Blacksburg, VA
- 2018 Macroevolution & Phylogenetics, BIOL 5984 , Virginia Tech, Blacksburg, VA
- 2018 Evolutionary Biology, BIOL2704, Virginia Tech, Blacksburg, VA
- 2011-2019 Instructor, Evolutionary Quantitative Genetics Workshop, NESCENT, NIMBioS & Friday Harbor Labs (Workshop with SJ Arnold & J Felsenstein)
- 2017 Workshop leader, *bayou* tutorial, SSB standalone meeting, Baton Rouge, LA
- 2016 Invited Instructor, Next Generation Phenomics Tools, Portland, Maine
- 2016 Invited Lecturer, Biology 102: Biology & Society, University of Idaho
- 2013-2016 Invited Lecturer, Biology 489: Herpetology, University of Idaho
- 2015 SSB Model Based Molecular Systematics Workshop, Guarujá, Brazil
- 2011 Lecturer, Biology 445/545: Evolution, Oregon State University
- 2011, 2012 Lecturer, Biology 211: Principles of Biology, Oregon State University
- 2010-2011 Teaching Assistant, Biology 211, 212 & 213 , Oregon State University

2006-2007	Teaching Assistant, Biology 211, 212 & 213, Oregon State University
2009-2012	Undergraduate Research Mentor, Zoology 401, Oregon State University
2012	Invited Lecturer, Biology 445: Evolution, Oregon State University
2009	Invited Lecturer, Biology 370: Ecology, Oregon State University
2006	Teaching Assistant, Biology 352: Plant Sys & Evol, Willamette University
2005	Teaching Assistant, Biology 355: Vertebrate Zoology, Willamette University
2004-2005	Teaching Assistant, Biology 125: Ecology, Evol & Diversity, Willamette University

Expert Reviewer Service

Proceedings of the National Academy of Sciences, Biology Letters, Current Biology, PLOS Biology, Evolution, The American Naturalist, Molecular Ecology (Top reviewer 2015), Systematic Biology, Methods in Ecology and Evolution, Ecology and Evolution, Journal of Human Evolution, Journal of Evolutionary Biology, Scientific Reports, Paleobiology, Proceedings Royal Society B, Axios, FONDECYT Chile, ROpenSci Software Review, Journal of Human Heredity, Nature Ecology and Evolution, New Phytologist, Nature Communications

Service

2020	Associate Editor, <i>Systematic Biology</i>
2019	Virginia Tech Biological Sciences Diversity Committee
2019	Society for Systematic Biology Council (Elected Member 2018, 3 yr term)
2017-2018	Biological Sciences Research Day Committee
2016	Postdoc mentoring program, University of Idaho
2010	Co-Founder of BIO-GradS: Broader Impacts and Outreach by Graduate Students organization, Oregon State University.

Community Outreach

March 2-5, 2015	Darwin Day Roadshow, Craigmont & Moscow, ID (~200 students, 2 schools)
April 21, 2013	Palouse Discovery Science Center, Pullman, WA (60 students)
October 24, 2011	“Evolution and Ecology Workshop”, Corvallis, OR (80 students, 4 teachers)
July 22, 2011	“GEAR UP” Latino student outreach panel, Corvallis, OR (30 students)
December 2, 2010	“Discovery Nights” -Wilson Elementary School, Corvallis, OR (50 students)
November 10, 2010	Philomath High School presentation, Philomath, OR (30 students)
September 20, 2010	“Darwin’s Legacy Workshop”, OSU (65 students, 7 teachers)
July 2, 2010	Evolution Teacher workshop, OSU (14 high school teachers)
May 18, 2010	West Albany High School visit to OSU (35 students)
April 15, 2010	Illinois Valley High School visit to OSU (35 students)
2010-2011	Dallas High School, (2 visits to 3 classes, ~60 students)
March 7, 2009	Science Potpourri, OSU (20 students)
January 22, 2009	Mountain View Elementary School, Corvallis, OR (23 students)
Spring, 2008	Fir Grove Elementary School (30 students)
2007-2011	Myers Elementary, Salem, OR (annual visits, 300 students)
2007 & 2008	SMILE tours, OSU (3 tours to middle school classes)
2007-2009	Avery House Volunteer, Corvallis, OR (3 events, 60 participants)

2005 Earthwatch assistant (helped lead ~15 volunteers), Salem, OR

Invited Presentations

- Oct 2019** *The measurement of macroevolutionary causes.* Emerging Leader Seminar (invited), Southeastern Population Ecology and Evolutionary Genetics Conference, Clemson, SC.
- Oct 2019** *The measurement of macroevolutionary causes.* American Museum of Natural History, New York, NY (invited seminar).
- July 2019** *Beyond tempo and mode: Toward process-based models of macroevolutionary trait evolution.* SteveFest, Oregon State University, Corvallis, OR. (invited speaker).
- June 2019** Evolution 2019, Providence, RI. *Extracting meaning from phylogenetic comparative methods: The necessity of considering process.* (invited speaker).
- Mar 2019** *Is speciation a cause of macroevolutionary change?* Gordon Speciation Conference, Ventura, CA (invited speaker).
- Oct 2018** *Macroevolutionary landscapes and phylogenetic natural history,* Department of Biology, George Washington University (invited seminar).
- Aug 2018** *On the need for phylogenetic natural history,* Evolution 2018, Montpellier, France (invited poster).
- June 2018** *On the need for phylogenetic natural history,* Mountain Lake Biological Station (invited seminar).
- Mar 2018** *On the need for phylogenetic natural history,* Department of Mathematics, Virginia Tech (invited mathbio seminar).
- Feb 2018** *On the need for phylogenetic natural history,* Department of Ecology and Evolution, Stony Brook University (invited seminar).
- Feb 2018** *On the need for phylogenetic natural history,* Phyloseminar (invited seminar).
Link: https://youtu.be/uzHz5jk_L7w
- Nov 2017** *The Macroevolutionary Dynamics of Adaptive Landscapes,* Biology Department, UNC-Chapel Hill. (invited seminar)
- Nov 2017** *The Macroevolutionary Dynamics of Adaptive Landscapes,* Department of Biology, Duke University. (invited seminar)
- Oct 2017** *On the need for phylogenetic natural history,* GBCB Seminar Series, Virginia Tech. (invited seminar).
- June 2017** *Trees, traits and functions: Semantics for Comparative Biology* (SSB workshop), Portland, OR. *Can ontologies help us understand trait evolution? (and vice versa?).* (invited lecture).
- June 2016** Next Generation Phenomics, Tools for the Tree of Life. *Analyzing 'phenomic' data on phylogenies.* (invited lecture)
- Mar 2012** *The Evolutionary Blunderbuss: Connecting micro and macroevolution.* Willamette University, Salem, OR. (invited lecture).

Contributed Talks and Posters

- June 2017** Evolution 2017, Portland, OR. *Tracking continuously-varying adaptive landscapes through macroevolutionary time.* (contributed talk).

- June 2016** Evolution 2016, Austin, Texas. *Using synthetic databases to construct time-calibrated phylogenies for comparative analyses.* (contributed talk)
- June 2015** Evolution 2015, Guarujá, Brazil. *The evolution of energetic scaling relationships across the vertebrate tree of life.* (contributed talk)
- Nov 2014** Modern Phylogenetic Comparative Methods, Seville, Spain. *A novel Bayesian method for identifying adaptive shifts on phylogenies.* (contributed talk)
- June 2014** Evolution 2014, Raleigh, NC. *Detecting billion year old rate shifts in microbial evolution.* (contributed talk, co-authors Carrine Blank, Lisa Moore and Luke Harmon)
- Apr 2014** EVO-WIBO, Port Townsend, WA. *Bayesian modeling of adaptive evolution on phylogenies.* (contributed talk)
- July 2013** Evolution 2013, Snowbird, UT. *Better interpretation of patterns of trait evolution using a novel reversible-jump method of detecting adaptive regimes from phylogenetic comparative data.* (contributed talk)
- July 2012** Evolution 2012, Ottawa, ON. *A classic example of stasis? Macroevolutionary patterns of body temperature evolution in mammals.* (poster, co-authors TF Hansen, G. Bloom and J Pienaar)
- July 2011** Evolution 2011, Norman, OK. *How can evolutionary process models simultaneously explain micro- and macroevolutionary patterns? And How to study big evolutionary divergence databases* (contributed talk, co-authors TF Hansen, SJ Arnold and J Pienaar)
- July 2010** Evolution 2010, Portland, OR. (contributed talk, co-authors TF Hansen, SJ Arnold and J Pienaar)
- Apr 2010** EVO-WIBO, Port Townsend, WA. (Poster- **Top Poster Award**)
- Sept 2009** CEES annual conference, Holmen Fjordhotell, Norway. (contributed talk)
- July 2009** Joint Meetings of Ichthyology and Herpetology, Portland, OR. (Poster)
- June 2009** Evolution 2009, Moscow, ID. (Poster)
- June 2008** Evolution 2008, Minneapolis, MN. *Speciation by drift in female mating preferences* (contributed talk, co-authors SJ Arnold, PA Hohenlohe and LS Mead)
- Apr 2008** EVO-WIBO, Port Townsend, WA. (contributed talk, co-authors SJ Arnold, PA Hohenlohe and LS Mead)

Symposium Organizer

- June 2019** *Beyond Tempo and Mode: Toward process-based models of macroevolutionary trait evolution* (co-organized with Stacey Smith). Evolution 2019, Providence, RI.
- Aug 2018** *The Macroevolutionary Dynamics of Form-Function Relationships* (co-organized with Martha Munoz). Evolution 2018, Montpellier, France.

Working groups

- Oct 2019** MicMac Working Group, University of British Columbia, Vancouver, BC, CAN
- Mar 2019** Long-term Trends in Evolution (Templeton Foundation), Biosphere 2, Tucson, AZ
- Dec 2017** Computable Evolutionary Phenotype Knowledge Workshop, Duke U., Durham, NC
- Feb 2016** Phenotypic Research Coordination Network, Biosphere 2, Tucson, AZ
- Aug 2015** Evolution of lifespan, Tri-CEM working group, Duke University, Durham, NC
- May 2015** Tempo and Mode of Plant Trait Evolution, NESCENT working group, Durham, NC
- Sept 2014** OpenTree Hackathon Tree-For-All, AVATOL working group, Ann Arbor, MI

Mentorship

Current Postdoctoral researchers

Diego Sasso Porto (Postdoctoral Researcher).

Former Postdoctoral researchers

Sergei Tarasov (Postdoctoral Researcher). (now curator at Natural History Museum of Finland, Helsinki, Finland in 03/2019).

Suman Neupane (Postdoctoral Researcher, now Assistant Professor, Murray State University).

Graduate Students

Nicholas Jordan Bone (PhD)

Bailey Howell (PhD)

Sean W McHugh (Msc)

Undergraduates

Sheng Kao (Oberlin College), Summer 2018 & 2019

Brian Yoon (Virginia Tech), Fall 2018-Spring 2019.

Heather Connor (Virginia Tech), Spring 2019

Visiting Research Scholars

Guilherme Dalponti (Federal University of Mato Grosso do Sul, Brazil) Spring 2020-Present.

Software

<i>bayou</i>	Bayesian fitting of Ornstein-Uhlenbeck models to phylogenies (author, R package), http://cran.r-project.org/package=bayou
<i>treeplyr</i>	' <i>dplyr</i> ' functionality for matched tree and data objects (author, R package), http://cran.r-project.org/package=treeplyr
<i>treedata.table</i>	A Wrapper For <i>data.table</i> For Fast Manipulation Of Phylogenetic Trees Matched To Data https://github.com/uyedaj/treedata.table/
<i>treetimer</i>	Time-calibrating phylogenies from the OpenTree of life (author, R package), https://github.com/uyedaj/treetimer/
<i>geiger v2.0</i>	Investigating evolutionary radiations (contributor, R package), http://cran.r-project.org/package=geiger
<i>Arbor</i>	Workflow software for comparative methods (contributor), www.arborworkflows.com