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Department of Biology
Villanova University
Villanova, PA 19085

September 20, 2016

Dear Search Committee,

I am writing to apply for the Integrative Organismal Biologist position in the Department of Biology. I am a broadly-trained evolutionary biologist that has worked on projects ranging from the organismal level (e.g. systematic, population and behavioral studies of amphibians, snakes, fish, and plants) to theoretical projects (sexual selection theory, evolution of the genetic architecture), to integrative studies seeking to understand how complex evolutionary processes lead to macroevolutionary patterns. In particular, my primary research aim is to develop novel phylogenetic approaches that integrate and synthesize cross-disciplinary data and theory to unite microevolutionary processes with macroevolutionary patterns. This enduring challenge to evolutionary biology has important implications for understanding the creation and maintenance of biodiversity in the face of global change. My current research projects seek to apply these approaches to systems ranging from the evolution of metabolic and physiological traits in plants and animals, using biophysical performance landscapes in studies of diversification, and integrating phenotypic ontologies into comparative "phenomic" studies of evolution.

A major theme of my research is deepening the connection between statistical macroevolutionary approaches, and the biological processes they intend to elucidate. By integrating other sources of biological knowledge, theory and data into macroevolutionary models, we can obtain more meaningful inferences as to the drivers of divergence and diversification across the tree of life. I work to integrate data — including genetic, paleontological and comparative data — to draw more meaningful understanding of how the evolutionary process leads to patterns of biodiversity. For example, my research examines how we might unite quantitative genetics theory and data with macroevolutionary models. To this end, in my current post-doc, I have developed novel Bayesian statistical methods for inferring adaptive evolution from across-species comparative data. These Bayesian models enable researches to use quantitative genetic and other evolutionary parameters as priors to constrain the model to biologically realistic scenarios. The framework provides powerful methods for understanding how factors such as climate change, habitat shifts or other factors drive phenotypic evolution while linking statistical models at the macroevolutionary scale with the biological processes they are intended to describe.

I currently have 2 collaborative NSF proposals (Division of Environmental Biology & Advancing Biological Infrastructure) under consideration as a PI and a third as Senior Personnel. The proposed projects include 1) further developing the methods from my postdoctoral work to understand the evolution of metabolic scaling, lifespan and other physiological traits across animal life, 2) integrating phenotypic ontologies into multivariate phylogenetic comparative methods and 3) testing whether biophysical performance landscapes derived from first principles can explain patterns of divergence and diversification in fishes. In all three cases, my research involves developing novel comparative approaches that combine existing methods with new sources of data with the goal of obtaining process-based biological explanations for macroevolutionary patterns. As subsidiary goals to these projects, I collaborate closely with major NSF-funded groups such as the OpenTree of Life and the Phenoscape Knowledgebase to build bioinformatic tools that enable fast-paced and user-friendly synthesis and construction of phylogenies and trait data matrices to hasten the discovery of patterns across the tree of life. I have authored a number of R packages and worked extensively on the Arbor project for building reproducible, scalable and web-integrated workflows for comparative methods. In order to assist with my pursuit of these research goals, the faculty at the University of Idaho recently voted unanimously to appoint me a Research Assistant Professor.

In addition to my research, I have extensive teaching experience. While a graduate student, I was the primary lecturer for three courses at Oregon State University, including an upper-level Evolution course. I have taken leadership roles in teaching and outreach activities as a graduate student, and have a strong track record in developing successful educational modules (see my teaching statement). I also have a demonstrated track record in obtaining competitive grants, and have published in high-profile journals, including first–authored publications in PNAS, Evolution and Systematic Biology. In addition, I am regularly invited as an instructor at many workshops and working groups to provide my expertise on comparative methods, quantitative genetics, phylogenetics and computational biology.

Research in my lab would be highly integrative. I have a deep love of natural history and strong background in organismal biology and quantitative genetics. Furthermore, I work at the intersection of methods, theory and empirical studies, allowing a large range of collaborative opportunities. I believe that my lab would be ideally suited to complement Villanova University's departmental expertise (with collaborative potential existing with the Bauer, Jackman, Curry and Iyengar labs). Profs. Stevan Arnold, Luke Harmon and Thomas Hansen have agreed to be my references. Please know that I would be excited to join the talented team at Villanova. I appreciate your consideration of my application.

Sincerely,

Josef C Uyeda

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CURRICULUM VITAE

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Academic employment

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

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

Supervisor: Prof. Luke J. Harmon

University of Idaho, Moscow, ID (Approved)

Research Assistant Professor, Department of Biological Sciences

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

McClain, CT, Balk, M, Thomas, K, and **JC Uyeda**. The evolution of body size extremes in deep-sea Selachimorphs and Cephalopods. *In Review, Proceedings of the Royal Society B.*

Uyeda, JC, Pennell, MW, Miller, ET, Maia, R and CT McClain. The evolution of energetic scaling across the vertebrate tree of life. *In Review, The American Naturalist.*.

Hagey, TJ, **Uyeda, JC,** Crandell, KE, Cheny, J, Autumn, K, and LJ Harmon. Tempo and mode of performance evolution across multiple independent origins of adhesive toepads in lizards. *In Review, Evolution.*

Uyeda, JC, Harmon, LJ and CE Blank. A comprehensive study of cyanobacterial morphological and ecological evolutionary dynamics through deep geologic time preserved in the genomes of modern taxa. *In press, PLoS One.*

Uyeda, JC. 2016. Quantitative genetics of evolutionary divergence and diversification. *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

2016 Enabling machine actionable semantics for comparative analyses of trait evolution (Co-PI). *Full proposal submitted to NSF Advancing Biological Infrastructure (in review)*.

2016 Does a complex performance landscape drive adaptive diversification? (Senior Personnel, lead PI Christopher Martin, UNC-Chapel Hill). *Invited full proposal submitted to NSF/BSF DEB Evolutionary Processes (in review).*

2016 The Evolution of Energetic Scaling (Co-PI). *Invited full proposal submitted to NSF DEB Systematics and Biodiversity Science (in review).*

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

2016 Invited Instructor: Next Generation Phenomics Tools, Portland, Maine

2016 Invited Lecturer, Biology 102: Biology & Society, University of Idaho

2011-2016 Teaching Assistant & Invited Lecturer, Evolutionary Quantitative Genetics Workshop, NESCENT & NIMBioS (Workshop with SJ Arnold & J Felsenstein)

2013-2016 Invited Lecturer, Biology 489: Herpetology, University of Idaho

2015 SSB Model Based Molecular Systematics Workshop, Guaruja, 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

University Service

2016 Postdoc mentoring program, University of Idaho

2010 Co-Founder of BIO-GradS: Broader Impacts and Outreach by Graduate Students organization, Oregon State University.

Expert Reviewer Service

Proceedings of the National Academy of Sciences, Evolution, The American Naturalist, *Molecular Ecology* (Top reviewer 2015), *Systematic Biology, Methods in Ecology and Evolution, Scientific Reports, Proceedings Royal Society B, Axios*

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

Professional Seminars/Talks

August 2016 Evolutionary Quantitative Genetics, NIMBIOS, Knoxville, TN. Multiple invited lectures.

June 2016 Next Generation Phenomics, Tools for the Tree of Life. *Analyzing 'phenomic' data on phylogenies.* (invited lecture)

June 2016 Evolution 2016, Austin, Texas. *Using synthetic databases to construct time-calibrated phylogenies for comparative analyses.* (contributed talk)

June 2015 Evolution 2015, Guaruja, 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)

August 2014 Evolutionary Quantitative Genetics, NIMBIOS, Knoxville, TN. *From micro- to macroevolution: Waiting for evolutionary bursts* (invited lecture)

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)

April 2014 EVO-WIBO, Port Townsend, WA. *Bayesian modeling of adaptive evolution on phylogenies.*

August 2013 Evolutionary Quantitative Genetics, NESCENT, Durham, NC. *From micro- to macroevolution: Waiting for evolutionary bursts* (invited lecture)

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)

March 2012 Invited Lecture, Willamette University, Salem, OR. *The Evolutionary Blunderbuss: Connecting micro and macroevolution*

August 2011 Evolutionary Quantitative Genetics, NESCENT, Durham, NC. *From micro- to macroevolution* (invited lecture)

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)

April 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)

April 2008 EVO-WIBO, Port Townsend, WA. (contributed talk, co-authors SJ Arnold, PA Hohenlohe and LS Mead)

Working groups

Aug 2016 Futurephy Hackathon, Moscow, ID & Lawrence, KS

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

Software

bayou Bayesian fitting of Ornstein-Uhlenbeck models to phylogenies (author, R package), http://cran.r-project.org/package=bayou

treeplyr *'dplyr'* functionality for matched tree and data objects (author, R package), http://cran.r-project.org/package=treeplyr

treetimer Time-calibrating phylogenies from the OpenTree of life (author, R package), https://github.com/uyedaj/treetimer/

geiger v2.0 Investigating evolutionary radiations (contributor, R package), http://cran.r-project.org/package=geiger

Arbor Workflow software for comparative methods (contributor), www.arborworkflows.com

Professional References

Prof. Stevan J Arnold
Department of Zoology, Oregon State University, Corvallis, OR
Graduate Advisor & Coauthor
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Prof. Luke Harmon
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Prof. Thomas F Hansen
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Research Statement

Josef C. Uyeda, PhD

Overview

The central aim of my research program is to discover how microevolutionary processes scale across space and time to produce macroevolutionary patterns. Despite a recent proliferation of macroevolutionary models, researchers working at different timescales maintain persistent disagreements over the pace, pattern and causes of macroevolutionary change. Yet these statistical models are often disconnected from realistic evolutionary processes. To address this problem, I synthesize data from microevolutionary, paleontological and phylogenetic comparative studies into a cohesive framework. In particular, I use the powerful theoretical framework of the phenotypic adaptive landscape to reconcile apparent discrepancies in the data. I develop novel methods and theory that bridge the across datasets and provide inference into the underlying dynamics of adaptive landscapes. I also build novel bioinformatic tools that manage and synthesize these large multidisciplinary datasets. By doing so, we can understand when and why adaptation succeeds or fails over long evolutionary time-scales, which is of central importance to maintaining earth's biodiversity in a changing world.

I work at the intersection of theory and empirical research, drawing on both to answer big questions in macroevolution. **I have broad training in a variety of empirical study systems, as well as theoretical studies of evolution.** I began as a herpetologist, and have conducted molecular phylogenetic studies of oceanic-dispersing frogs (Uyeda et al. 2007; *Proc. Cal. Acad. of Sci.*), behavioral studies of plethodontid salamanders (Eddy, Kiemnec-Tyburczy, Uyeda and Houck, 2012; *Ethology*) and phylogeographic studies of garter snakes (Uyeda et al. *in prep*). Even so, I have broad interest in a variety of organismal models, and have conducted investigations of organisms as varied as camas lilies (Uyeda and Kephart, 2007; *Sys. Bot.*), surfperch (Westphal, Morey, Uyeda and Morgan, 2011; *J. of Fish Biol.*) and mammals (Uyeda et al. *in prep*). I leverage this experience in my approach to evolutionary biology and the development of phylogenetic comparative methods, which forms the core of my research program.

Research objectives - Connecting micro to macro

A fundamental problem I address in my research is understanding the forces that constrain or promote phenotypic evolution at macroevolutionary scales. A particularly troubling paradox hindering synthesis across scales is the frequent observation of stasis in the fossil record, which seems incompatible with the ubiquitous observation of rapid evolution at microevolutionary scales. This paradox highlights the persistent disconnect between microevolutionary and macroevolutionary studies, and has lead to long-standing feuds over whether microevolutionary processes can explain macroevolutionary patterns. However, this debate has flourished largely in the absence of rigorous and quantitative testing of evolutionary models—a situation my research program seeks to remedy.

As increasing amounts of data become available, a central question is whether the corpus of evolutionary data collected to date from microevolutionary, paleontological and phylogenetic comparative scales forms a cohesive picture of evolution. To address this, I assembled a massive phenotypic divergence database on body size divergence from timescales of less than a year, to over 300 million years (Uyeda et al. 2011; *PNAS*). This synthetic database demonstrated a remarkably continuous pattern of divergence through time, with seamless transitions from each data source. Even so, we detected a strong signature of stasis in which evolutionary divergence was significant, but bounded, up until a million-year threshold. We fit models to these joint datasets and demonstrated that burst-like evolutionary processes on million-year timescales best explained the pattern we observed. Much work remains to be done to understand this perplexingly consistent million-year timescale for phenotypic evolution (Pennell, Harmon and Uyeda 2013; *TREE*). **The pattern we observed in Uyeda et al. (2011) provides the backdrop for my research program: How do we scale the known processes of microevolution across paleontological and phylogenetic**

timescales to result in the cohesive patterns we observe?

To achieve this synthesis, I take both a "bottom up" approach using the tools of quantitative and population genetic theory, and a "top down" approach using phylogenetic comparative and paleobiological models of evolution. These approaches are united by framing evolution in terms of adaptive landscapes. Providing theory and tools infer and predict the dynamics of adaptive landscapes should be a central goal of 21st century biology.

The bottom up approach - Evolutionary Genetics

Quantitative genetics theory provides a robust, empirically-validated framework for understanding how the forces of mutation, selection, migration, drift and genetic constraints affect trait evolution. My strong background in quantitative genetics allows me to address the challenging goal of connecting microevolutionary forces to the dynamics of adaptive landscapes evolving over larger spatial and temporal scales (Uyeda 2015, *Ency. of Evol. Bio.*). **Scaling population-level genetic theory across spatial and temporal scales is a vital area of research, and I will work toward extending quantitative genetic theory to macroevolutionary scales.**

Much of my previous theoretical work has involved connecting quantitative genetic theory to macroevolution. I united microevolutionary measures of reproductive isolation with quantitative genetic models of sexual selection to make quantitative predictions about speciation (Uyeda et al. 2009; *Evolution*). Our research demonstrated the importance of genetic drift in speciation by sexual selection and highlighted the need to examine stochastic versions of models of sexual selection. I also worked on a simulation study examining the evolution of genetic architecture (i.e. the G-matrix) under episodic selection (Jones, Bürger, Arnold, Hohenlohe, and Uyeda, 2012; *J. of Evol. Biol.*). Understanding the conditions that promote G-matrix stability is a central question to understanding how genetic constraints affect long-term evolutionary dynamics. Our study is especially relevant given the increasing support we find for episodic evolutionary patterns at macroevolutionary scales (Uyeda et al. 2011).

A major challenge in scaling from micro to macroevolution is uniting population-level theory to species-level dynamics. Consequently, I will work toward scaling existing theory across spatial scales using both analytic and simulation-based approaches. Existing theory focuses primarily on single populations with static adaptive peaks. This must be expanded to meta-populations across heterogenous landscapes to explain species-level evolutionary trajectories. I will pursue evolutionary-demographic models of trait evolution that combine quantitative genetic models with demographic models. These models show considerable promise for explaining the hierarchical nature of both speciation and phenotypic evolution at macroevolutionary scales.

From the top - Phylogenetic comparative methods

The era of big data in phylogenetics has fed a rapid surge of phylogenetic comparative methods. **However, phylogenetic comparative models largely remain disconnected from microevolutionary processes, and instead are phenomenological models describing pattern.** This has lead to considerable confusion as to what inferences macroevolutionary models provide (Pennell, Harmon and Uyeda, 2013; Uyeda et al. 2015, *Systematic Biology*).

To address this problem, **I have developed a set of phylogenetic comparative methods that integrate different sources of data to anchor comparative models in biological reality.** For example, I have developed a method (implemented into the R software package *bayou*) that allows users to fit Bayesian models of adaptive trait evolution (i.e. Ornstein-Uhlenbeck models; Uyeda and Harmon 2014; *Systematic Biology*). The novelty of my approach is two-fold. First, my method can incorporate outside information from microevolutionary or paleontological data, connecting macroevolutionary models to the dynamics of evolution observed at other timescales. The great advantage of Bayesian analyses is the ability to perform synthetic and integrative analyses while accounting for uncertainty. By doing so, we can explic-

itly test and compare process-based interpretations of macroevolutionary patterns or quantitatively assess whether datasets are compatible. The second advancement of *bayou* is that it uses reversible-jump methods that do not require *a priori* adaptive hypotheses (as is required by other methods). Instead, *bayou* shifts the focus to direct inference of the dynamics of adaptive landscapes themselves.

I have further extended *bayou* to identify changes in the evolutionary scaling relationships between traits, providing a powerful tool for the studying the adaptive landscape of physiology and metabolism. Together with Dr. Craig McClain, I have tested for the existence of a universal scaling relationship between body mass and metabolic rate. We show conclusively that the slope evolves and is not universal. We identify for the first time where shifts occur across the vertebrate tree of life and provide a method for determining the correlates of these shifts (Uyeda et al., *in review*). In addition to metabolism, I have started several collaborations to apply my method to other physiologically important scaling relationships, including the evolution of vessel anatomy in angiosperms and the evolution of lifespan across animal clades. I currently have an invited full proposal submitted to NSF (DEB: Systematics & Biodiversity, The Evolution of Metabolic Scaling, PI) developing approaches to understand how the adaptive landscape of metabolic and other related physiological traits have changed over the course of animal evolution. Furthermore, I am Senior Personnel on a invited proposal to the Binational Science Foundation (DEB & BSF: Evolutionary Processes, Does a complex performance landscape drive adaptive diversification?) that expands *bayou* by enabling the integration of empirically or theoretically-derived performance landscapes as macroevolutionary adaptive landscapes. These surfaces can then be used to test for diversification patterns across evolutionary radiations, and potentially determine which measures of performance have driven morphological evolution in a group. **These proposals give a taste of my ultimate goal of providing an expansive set of Bayesian methods for inferring the dynamics of adaptive landscapes that can unite microevolutionary, paleontological and comparative data.**

A key component of this integration is connecting flexible and customizable analyses with new data sources. To this end, I am currently part of a development team building visual workflow software for analyzing comparative data (Arbor, http://avatol.org/). Our goal is to simplify the usage of complex models of evolution by users inexperienced in programming while maintaining the power and flexibility to design custom hypotheses by using visual workflows. As part of the Arbor team, I have also worked closely with the Next-Generation Phenomics and OpenTree of Life AVAToL projects which seek to provide data resources for traits and phylogenies, respectively. In an ongoing collaboration with Dr. Carrine Blank at the University of Montana studying cyanobacterial evolution, we have used these large "phenomic" datasets to correlate rate shifts in phenotypic evolution to several billion-year old oxygenation events in the history of earth (Uyeda et al. *in press, PLOS ONE*). To continue this work, I have recently submitted a collaborative NSF proposal (ABI: Enabling machine actionable semantics for comparative analyses of trait evolution, PI) to build novel comparative approaches that integrate phenotypic ontologies with models of trait evolution. Our goal is to leverage ontologies (a computational representation of our knowledge regarding the relationships and definitions of phenotypic traits) to address the challenging goal of finding codiversifying traits across large, multivariate data matrices that violate common assumptions of independent trait evolution.

Synthesis

My research seeks to unite micro and macroevolution–connecting our understanding of evolutionary processes to the important long-term outcomes of these processes. To accomplish this goal, I develop tools and theory that allow biologists to synthesize data collected from micro to macroevolutionary scales in a coherent and unified framework. Many of the outstanding questions in macroevolution are interpretational disputes over statistical patterns detached from biological processes. This has lead to acrimonious debates and sometimes naive extrapolation of microevolutionary processes to macroevolutionary scales. Only by uniting data and theory across scales can we make progress toward a truly synthetic evolutionary theory. I believe the integrative approach I take to science, and would bring an exciting dimension to the Department of Biology at Villanova University.

Teaching Philosophy

Josef C. Uyeda, PhD

Overview

As an evolutionary biologist, I view evolution to be one of the most unifying, powerful and broad-reaching ideas ever developed. Understanding the implications of evolution requires problem-solving and critical thinking. Unfortunately, decades of teaching research demonstrates that teaching critical thinking is extremely difficult and cannot be separated from developing domain knowledge. A more tractable goal for training students is to foster a classroom environment that motivates students to invest in developing a deep understanding of evolutionary and biological science. I particularly emphasize throughout all my courses the development of quantitative reasoning and computational skills. Furthermore, I would work to implement needed reforms in biology education–such as implementing "flipped classrooms" and course-based research experiences rather than traditional lecture formats. Scientific teaching research has demonstrated unequivocally that such techniques greatly improve learning outcomes while simultaneously increasing participation and diversity in STEM fields.

To build classroom community, I ensure that students engage each other in teamwork and discussion in a safe and judgement-free environment. For example, on the first day of my evolution course I had students write down what they thought was the best evidence for evolution, as well as the most convincing argument against evolution. Students then crumpled their sheets of paper, and tossed them randomly throughout the classroom. After a few rounds of tosses, each student grabbed the nearest sheet of paper. I broke out students into groups that were tasked with writing as best they could an argument based on the perspective of the papers they obtained. This was effective in drawing out misconceptions among students and fostering discussion, while simultaneously preserving anonymity and encouraging teamwork. As another example, I set up a class-run blog and that encouraged interaction between graduate students posting on research topics and undergraduate students that were given participation credit for comments. Given this venue, students began discussing and posting on topics above and beyond what was required of the class.

One of the greatest impediments to student success in critical thinking is the entrenched heuristics that students use to view the world—these must be proven to fail before the correct model can take hold. This is especially true for evolutionary topics, which have extensive popular misconceptions. Consequently, **I try to set up frequent situations for my classrooms—as a group and without consequence—to fail. Setting up situations where the student's intuition fails memorably breaks their faith in flawed pre-existing heuristics and motivates them to ask the question "why?".** Failed predictions also mirror the scientific process. I work to set-up "aha" moments through a variety of active learning strategies and inquiry-based investigations that engage the participation of the students. Working as a group helps eliminate shame or embarrassment from incorrect predictions. Rather, being wrong is accepted as a necessary step to being right. I frequently use technology in the classroom such as iClickers or simulations of evolutionary processes to ask questions intended to specifically challenge common misconceptions and assess student understanding.

Instead of trying to teach in a single pass, I view teaching as painting on successive layers of understanding and detail—conveying the end-goals from the beginning while layering on foundational knowledge. For example, my philosophy on homework is to provide challenging problems that students have multiple, low-risk opportunities to complete. In my Evolution course, students had problem sets at regular intervals that were due in a week's time. However, these were not initially scored, but simply marked right or wrong, and turned back to the students for another week. Students had the opportunity to turn in assignments two more times before a score was officially entered. This technique was extremely effective for both me and the students. It focused students attention on their mistakes, gave them personal responsibility for correcting them, allowed low-pressure opportunities for students to assess their understanding, and (quite popularly among students) gave them flexibility as to when to focus their effort in their busy lives. A given problem set overlapped with a large number of lectures, and student's repeated attempts to complete the

assignments coincided with increasing layers of understanding of the material. These assignments also allow me to quickly assess and intervene when the class was going astray.

In my courses, I emphasize quantitative reasoning and computational skills. I recognize that not every undergraduate (or even graduate student) taking my courses will go on to become an evolutionary biologist. Nevertheless, the principles of evolutionary biology and the ability to understand quantitative data are essential to a wide range of career paths—including health care, industry and academia. Evolution is a statistical process, yet students are often intimidated by statistics and mathematics. Consequently, I directly work to overcome these artificial and self-imposed limitations on student's abilities. To accomplish this challenging goal, I stress conceptual understanding rather than memorization of procedural recipes. For example, I make heavy use of animated computer simulations that I design to visually demonstrate a mathematical process in action, rather than spending large amounts of time teaching the details of a statistical test. Furthermore, I use computational tools such as the statistical programming language R to train students in how to access, manage, analyze and simulate datasets on their own to build their intuition. By using these tools to answer biological questions, students simultaneously get exposure to computational biology, data science and statistics while they explore evolutionary questions.

Summary of Teaching Experience

I have taught extensively throughout my undergraduate and graduate career. I began designing laboratories as an undergraduate TA for my advisor's plant systematics course at Willamette University. I developed a bioinformatics lab in which students built phylogenies from DNA sequences which I later refined and implemented at Oregon State University. This lab is now used in the introductory biology course taken by over a thousand students each year. I have extensive TA experience in seven different courses. I have further honed my teaching abilities by participating in teaching seminars and a course on scientific teaching.

In addition to being a TA, **I have taught three courses as the primary lecturer**. During the summer session, I twice taught the biology major's introductory course (Biology 211, ∼125 students per class). I centered the course on tree-thinking and made evolution the core theme, while simultaneously getting students excited about diversity. These large lecture courses compressed an entire term into a few weeks time. In other words—my first experience as a primary lecturer involved creating all new materials on the fly for a 10-week course compressed into only 4 weeks. Despite these challenges, I feel that these courses were quite successful in reaching both my and the student's goals. I also obtained valuable skills in time management and lecture preparation—skills that will no doubt useful as an entering faculty member. My most rewarding teaching experience thus far was teaching a 400/500-level Evolution course of around 80 undergraduate and graduate students. I had full control of the course and used a variety of teaching methods including games, group activities, and a class-run blog.

Proposed Courses

I am well-equipped to a teach a variety of courses to serve the student body at Villanova University. I am comfortable teaching both introductory majors and non-majors biology courses. I can also teach courses on vertebrate zoology, herpetology, ornithology, and plant systematics. I integrate evolution into all of my courses, and would be at home teaching courses on evolutionary topics. To that end, I could teach evolution, genetics, and phylogenetic systematics. For advanced and graduate-level courses, I would combine hands-on experience with computational biology and evolutionary modeling using lab courses that allowed students to experiment and "play" with evolutionary models. Examples of courses that I would be excited to teach include quantitative/evolutionary genetics, macroevolution, biostats and computational modeling in biology.

Contribution to Villanova's Mission & Goals

Josef C. Uyeda, PhD

Summary

I have many goals as a scientist–my role extends far beyond solely research and scholarship. In fact, I must admit that I have often questioned the importance of my science relative to colleagues who have gone on into full-time teaching research, STEM outreach and other careers that seek to change the culture and community of science for the better. What is the value of making a scientific discovery–regardless of its significance–relative to inspiring and growing a comunity of future researchers whose potential for discovery far outstrips the contribution of a single person? Luckily, these goals are not mutually exclusive, and I would work carry out the directive of Villanova's mission statement in my mentoring, teaching and outreach activities. Below, I particularly highlight my committment, both past and future, for building an academic community that fosters diversity as a means of achieving academic excellence.

Creating a diverse community of scholars

Removing the socioeconomic and cultural barriers to student academic and professional success are critically important goals to my work as a researcher, teacher and mentor. Science operates as a community, and building a culture of diversity and inclusiveness will not only benefit individuals, but also the entire scientific enterprise. Throughout my career as a scientist, I have taken great personal enjoyment in participating in outreach, teaching and mentoring with the specific goal of reaching underserved groups. In the course of my efforts, I also came to recognize that these interpersonal contributions—while rewarding and important—are only one facet of what is necessary to adequately address achievement gaps between minority and white students. Rather, it is vital that university faculty build, support and integrate with institutional programs that provide sustainable and broad-reaching opportunities for participation of underrepresented minorities in STEM fields and ongoing access to the resources of university campuses. I recognize the importance building and maintaining relationships that promote sustainable access to research opportunities. Consequently, I would work to help build and strengthen existing programs (the STEM outreach programs in Engineering at VU provide an excellent model) as well as recruiting students and participating in events with national organizations such as SACNAS.

Throughout my graduate career, I engaged extensively in outreach activities and developed strong continuing relationships with educators and organizations. I have taught students across a range of educational levels—from kindergarten to workshops for high school teachers. I made annual visits to many schools to present modules on genetics, evolution and herpetology using live animals demonstrations, interactive card games and animated simulations to teach the principles of evolution. I collaborated with outreach programs at Oregon State University to organize and implement activities to reach underserved student populations. For example, **I co-organized and lead two workshops in which we funded campus visits for students from low-income school districts from across the state for a full day of activities. As a co-PI, I obtained outside funding for each of these events including three grants from local and national organizations that allowed us to pay for all of the expenses of the participating schools—some from over 200 miles away. In addition, I co-founded a graduate student run organization focused on outreach at Oregon State University called BIO-GradS (Broader Impacts and Outreach by Graduate Students).** This organization continues to provide a central contact for the biology graduate student community to interact with the community at large, organize outreach events, and collaborate to develop outreach activities.

As an instructor, I developed my teaching philosophy based in part on techniques shown to work for closing achievement gaps between traditionally underrepresented groups in STEM fields (see Teaching Statement). I achieve this goal by fostering community, employing active learning techniques, directly addressing misconceptions and by allowing students low-risk opportunities to fail—thereby providing an inclusive environment that attempts to give everyone an opportunity to succeed and contribute. I teach students that "I don't know, but I can find out" is a much more

valuable answer than already having complete knowledge of the topic. By valuing the process of learning more than current knowledge, students of all backgrounds can gain confidence in their abilities.

As a laboratory manager and mentor, I would strive to build a culture of inclusiveness. I will encourage my graduate students to participate in outreach activities and undergraduate mentoring. I have written undergraduate funding for research in all my grant proposals, as a common barrier for economically disadvantaged undergraduates is getting research experience while simultaneously paying for their education. Providing opportunities for students to conduct research in my lab with funding support would be a top priority. In addition, I would work to set up training opportunities for graduate students developing their teaching, mentoring and outreach skills by organizing seminars, courses or workshops. By encouraging a departmental culture that values teaching and outreach by graduate students and harnesses their energy and innovation, it is possible to create a far-reaching impact. This would simultaneously help promote a culture of inclusiveness among the graduate students that valued contributions in a variety of domains of research and education.

Official Academic Transcript from:
WILLAMETTE UNIVERSITY
OFFICE OF THE REGISTRAR
900 STATE STREET
SALEM, OR 97301-3930

TELEPHONE: 503-370-6206

Document Type: THIRD-PARTY SECURE PDF

Academic Transcript of:
JOSEF CHRISTENSEN UYEDA
Date of Birth: 5-Mar-xxxx
Transcript Created: 30-Sep-2014

Intended Recipient:
JOSEF UYEDA
242 N ASBURY ST #1
MOSCOW, ID 83843

E-Mail: pseudacris@gmail.com

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College or University

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WILLAMETTE UNIVERSITY
900 State St. Salem, Oregon 97301

NAME | BIRTHDATE

Mr. Josef C. Uyeda | 0753662 | 03/05

524 Montanya St SW Apt A
Albany OR 97321

*** UNDERGRADUATE TRANSCRIPT *** (Please note: Unit of credit = 4 semester hours, or 6 quarter/term hours.)

Summer 2002

BIOL	110AP	Princ of Biology (AP Credit)	1.00	5	.....	
ENGL	100AP	General Credit (AP Credit)	1.00	5	.....	
HIST	115AP	Western Civiliz I (AP Credit)	1.00	5	.....	
MATH	141AP	Calculus I (AP Credit)	1.00	5	.....	
MATH	142AP	Calculus II (AP Credit)	1.00	5	.....	
HIST	113AP	U S History I (AP Credit)	1.00	5	.....	

Fall 2002

IDS	123W 05	World Views	1.00	A	4.00
MATH	249 01	Multivariable Calculus	1.00	A	4.00
CHEM	115 03	Introductory Chemistry I	1.00	A	4.00
GERM	231 01	Intermediate German I	1.00	A	4.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	4.00	16.00	4.00
CUM:	10.00	10.00	4.00	16.00	4.00

Spring 2003

BIOL	125 01	Ecology, Evolution & Diversity	1.00	A	4.00
CHEM	116 02	Introductory Chemistry II	1.00	A	4.00
BIOL	130 01	Cell Biology & Genetics	1.00	A	4.00
GERM	232 02	Intermediate German II	1.00	A	4.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	4.00	16.00	4.00
CUM:	14.00	14.00	8.00	32.00	4.00

Fall 2003

BIOL	244 01	Physiol Dynam/Animals&Plants	1.00	A	4.00
CHEM	225 01	Organic Chemistry I	1.00	A	4.00
LATIN	131 01	Elementary Latin I	1.00	A	4.00
BIOL	256 01	Field Zoology	1.00	A	4.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	4.00	16.00	4.00
CUM:	18.00	18.00	12.00	48.00	4.00

Spring 2004

BIOL	352W 01	Plant Systematics/Evolutn	1.00	A	4.00
CHEM	228 01	Org Chem II: Bioorganic Emph	1.00	A	4.00
ARTH	215 01	Wstrn Art Hist I: Prehist-Goth	1.00	A	4.00
RHET	232 01	Persuasn, Propgnda, Mass Med	1.00	A-	3.70

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	4.00	15.70	3.93
CUM:	22.00	22.00	16.00	63.70	3.98

Fall 2004

ENGL	242W 01	The Essay: Nature Writing	1.00	A	4.00
BIOL	498 01	Biology Colloquium	0.50	A	2.00
BIOL	250 01	Microbiology	1.00	A	4.00
CHEM	321 01	Physical Chemistry I	1.00	A	4.00
BIOL	499 01	Honors Research in Biology	0.50	A	2.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	4.00	16.00	4.00
CUM:	26.00	26.00	20.00	79.70	3.99

==========

Laura Jacobs Anderson
University Registrar

WILLAMETTE UNIVERSITY
900 State St. Salem, Oregon 97301

NAME | BIRTHDATE

Mr. Josef C. Uyeda 0753662 03/05

524 Montanya St SW Apt A
Albany OR 97321

*** UNDERGRADUATE TRANSCRIPT *** (Please note: Unit of credit = 4 semester hours, or 6 quarter/term hours.)

Spring 2005

BIOL	255	01	General Ecology	1.00	A	4.00
BIOL	470	01	Special Topics in Biology	1.00	A	4.00
BIOL	498	01	Biology Colloquium	0.50	A	2.00
MATH	138	02	Statistics	1.00	A-	3.70

Degree Received: Bachelor of Arts on 05/2006
Majors.....: Biology
Minors.....: Chemistry
Honors.....: Summa Cum Laude
Phi Beta Kappa
Department Honors: Biology

BIOL	497	01	Research in Biology		CIP	.....
BIOL	499		Honors Research in Biology	0.50	A	2.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	4.00	15.70	3.93
CUM:	30.00	30.00	24.00	95.40	3.98

Fall 2005

BIOL	376	01	Evolutionary Biology	1.00	A	4.00
CHEM	351	01	Biochemistry	1.00	A	4.00
ECON	122	03	Principles of Microeconomics	1.00	CR	.....
BIOL	353W	01	Behavioral Ecology	1.00	A	4.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	4.00	4.00	3.00	12.00	4.00
CUM:	34.00	34.00	27.00	107.40	3.98

Spring 2006

PHYS	221	01	Introductory Physics I	1.00	A	4.00
BIOL	470	01	Top: Genes and Developement	1.00	A	4.00
CHEM	322	01	Physical Chemistry II	1.00	A	4.00
BIOL	497	01	Research in Biology	0.25	A	1.00

College Honors

	Earned-Tot	Earned-WU	For GPA	Grd Pts	GPA
TERM:	3.25	3.25	3.25	13.00	4.00
CUM:	37.25	37.25	30.25	120.40	3.98

Degree Received: Bachelor of Arts on 05/2006
Majors.....: Biology
Minors.....: Chemistry
Honors.....: Summa Cum Laude
Phi Beta Kappa
Department Honors: Biology

========== (END OF RECORD) ==========

Laura Jacobs Anderson
University Registrar

WILLAMETTE UNIVERSITY
900 State St. Salem, Oregon 97301

Willamette University is an independent, coeducational university with a college of liberal arts and graduate programs in law, management, and teaching. Founded in 1842 by the same Methodist missionaries who developed the Oregon Territory, it is the first university in the West.

Accreditation

The University is fully accredited by the accrediting agencies for American colleges and universities. It is a charter member of the National Commission on Accrediting, and is a member of and accredited by the Northwest Association of Schools and Colleges. It is also accredited by the University Senate of the United Methodist Church. Other accreditations and memberships are listed in the Willamette University Catalog.

College of Liberal Arts

The undergraduate program, also referred to as the College of Liberal Arts, grants or has recently granted the following degrees: B.A. (Bachelor of Arts); B.S. (Bachelor of Science); B.M. (Bachelor of Music); B.M.Ed. (Bachelor of Music Education); and B.T. (Bachelor of Theatre).

College of Law

The Willamette University College of Law was established in 1883, the first in the Pacific Northwest. The College of Law has been on the American Bar Association approved list of Law Schools since 1938 and has been a member of the Association of American Law Schools since 1946. Graduates receive Doctor of Jurisprudence degree (J.D.). The College of Law also offers Master of Laws degrees (LL.M.) in transitional law and dispute resolution.

Atkinson Graduate School of Management (AGSM)

The George H. Atkinson Graduate Schools of Management was founded in 1974 as the Graduate School of Administration, renamed George H. Atkinson Graduate School of Administration in September 1975, and was given its current name in July 1981. The School offers a twenty-one month program leading to the Master of Business Administration for Business, Government and Not-for-Profit Management (M.B.A.) degree, and a twenty-four month professional program leading to the Master of Business Administration (M.B.A.) degree. Both MBA programs are accredited by the Association to Advance Collegiate Schools of Business (AACSB International), and the twenty-one month program is also accredited by the National Association of Schools of Public Affairs and Administration (NASPAA). Previous degrees granted are M.M. (Master of Management) and M.Ad. (Master of Administration).

Graduate School of Education

In Fall 1988, Willamette University began a graduate-level program in teacher preparation. Renamed in 2010, the Graduate School of Education (GSE) offers a Master of Arts in Teaching (MAT) degree, preparing students for an initial teaching license, as well as a Master of Education (M.Ed.) degree, developing educators teaching in any context. Additional programs within the GSE provide recommendations for an Administrator License (IAL & CAL) and endorsements in ESOL, SPED, and Reading. These programs are accredited by the National Council for Accreditation of Teacher Education (NCATE) as well as the Oregon Teacher Standards and Practices Commission (TSPC).

Calendar

All undergraduate and graduate degree programs operate under the semester calendar, with units of credit as defined below.

Credits

- College of Liberal Arts: Since Fall 1967, undergraduate courses have used a credit unit which is equivalent to 4 semester hours or 6 quarter hours. Prior to that date, semester hours were used.
- College of Law: semester hours.
- AGSM: semester hours.
- MAT program: Semester hours. Prior to Fall 2010, same as Coll. of Liberal Arts.
- Graduate School of Education Professional Educator Program: quarter (term) hours through Summer 2010; semester hours effective Fall 2010. For 700-level courses with an ED prefix, quarter (term) hours through Spring 2011; semester hours effective Summer 2011.

Transcripts/Confidentiality of Records

Willamette University does not provide transcripts from other colleges, universities, or high schools or transcripts of standardized tests. Transcripts of records from other institutions must be obtained from those institutions.

Willamette University follows the guidelines of the American Association of Collegiate Registrars and Admissions Officers (AACRAO) with regard to the content and release of student records.

The Family Educational Rights and Privacy Act of 1974 prohibits the release of this record to a third party without written authorization of the student.

Willamette University Registrar's Office
(503) 370-6206
registrar@willamette.edu
University catalog available at
http://www.willamette.edu/cla/catalog/

Graduation Honors

Recognition for academic excellence through the College of Liberal Arts and College of Law are awarded in three categories: Cum Laude, Magna Cum Laude, and Summa Cum Laude.

Grades and Grade Points

- ***College of Liberal Arts***: the A-F system with +/- is used, A(4.0); A-(3.7); B+(3.3); B(3.0); B-(2.7); C+(2.3); C(2.0); C-(1.7); D+(1.3); D(1.0); F(0.0).
  Other grading systems used are as follows (with grade values unchanged):
  1842-Summer 1976 – A,B,C,D,F
  Fall 76-Summer 77 – A,A-,B+,B,B-,C+,C,C-
  Fall 77-Summer 80 – add grades of D+, D
  Other grade indicators which are or have been used are:
  - AUD - Audit, no credit or grade points
  - CR - Credit, credit given but not calculated in GPA
  - I - Incomplete, not calculated in GPA
  - N - (prior to Fall 1980) - Not Passing, no credit, not calculated in GPA
  - NC - No Credit, no credit or grade points
  - NGR - No Grade Submitted (temporary grade), no credit or grade points
  - P - (prior to Fall 1980) – Pass, credit given, not calculated in GPA
  - Q - Final Grade Determined Upon Completion of Work, no credit or grade points
  - T - Incomplete, not calculated in GPA (from 1980 to 1990 a contingency grade (eg. TC+) was given, which was used in the GPA calculation until the "T" grade was removed.
  - W - Withdrawal, no credit or grade points
- ***College of Law***: For students entering prior to Fall 1991, a numerical grading system was used. Grades ranged from 55 to 90, with the following number-to-letter equivalency: 87-90(A); 83-86(A-); 80-82(B+); 77-79(B); 75-76(B-); 73-74(C+); 70-72(C); 67-69(C-); 64-66(D+); 60-63(D); 56-59(D-); 55(F).
  For students entering Fall 1991 through Summer 2001, a letter grading system was used: A(4.0); A-(3.7); B+(3.3); B(3.0); B-(2.7); C+(2.3); C(2.0); C-(1.7); D+(1.3); D(1.0); D-(0.7); F(0.0).
  For students entering Fall 2001 and to date, a letter grading system is used: A+(4.3); A(4.0); A-(3.6); B+(3.3); B(3.0); B-(2.6); C+(2.3); C(2.0), C-(1.6); D+(1.3); D(1.0), D-(0.6); F(0.0).
  Other symbols which are or have been used are: AUD (Audit); CR (Credit); H (Honors); HH (High Honors); I (Incomplete); NC (No Credit); NGR (No Grade Received, temporary grade); P (Pass); T (Incomplete); W (Official Withdrawal); WI (Involuntary Withdrawal); X (Administrative Withdrawal); 55 (Failure); * (High Paper).
  In Summer 1992, the grading option of "H/P/F" was changed to "H/CR/NC", with the following grade equivalency: H(83-90 or A to A-); CR(67-82 or B+ to C); NC(55-66 or C- to F). Also effective Summer 1992, incompletes are recorded as "I" instead of "T".
- ***Atkinson Graduate School of Management (AGSM)***: The following grades are used: A(4.0); A-(3.7); B+(3.3); B(3.0); B-(2.7); C(2.0); F (0.0).
  Other symbols are: I = Incomplete; P = Pass; N = No Pass; T = Grade pending continuation of a full-year course; W = Withdrawal from course; CR = Credit, credit given but not calculated in GPA.
  Other grading systems used are as follows:
  Fall 74-Fall 75 – A(4.0); B(3.0); C(2.0); F(0.0).
  Spr 76-Spr 78 – A(4.0); A-(3.67); B+(3.33); B(3.0); B-(2.67); C+(2.33); C(2.0); F(0.0).
  Fall 78-Spring 83 – A(4.0); A-(3.67); B+(3.33); B(3.0); C(2.0); F(0.0).
- ***Graduate School of Education***: same as Undergraduate

Course Numbering System

- College of Liberal Arts: since Fall 1981, courses have been numbered as follows: 001-099, no credit toward graduation; 001X-099X and 100-299 (lower division credit); 300-499 (upper division credit).
  From Fall 1967 to Summer 1981, all undergraduate courses were numbered 01-99. A course such as ENGL11 could also show as ENGL 011, depending on the style of the transcript. Prior to Fall 1967, courses were numbered 001-499.
- College of Law: post-baccalaureate, with a 'LAW' prefix, numbered 001-499.
- Atkinson Graduate School of Management (AGSM): graduate level courses, with a prefix of GSM: Prior to Fall 1993, courses were numbered 100-399. Beginning Fall 1993 through Summer 2012, courses were numbered 500-799. Beginning Fall 2012, GSM courses are numbered 5000-7999. Graduate level courses with a prefix of GSMPR are numbered 600-699. Certificate program courses have a five-letter prefix (other than GSMPR) beginning with GSM__ and EDC__.
- MAT program: graduate level courses with a prefix of 'EDUC', numbered 500-599.
- M.Ed. Program: graduate level courses with a prefix of 'EDM', numbered 500-599 and prefix of 'ED' numbered 500-799.
- Professional Educator courses: prefixes of 'ED', 'CET', 'EDAD', 'ENDR', 'SPED', 'PWS', and 'EDU', courses numbered 500-799.

Oregon State University Transcript

Josef C. Uyeda
Sep 29, 2014 12:05 pm

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OSU ID : 931148963 Record of : Josef Christensen Uyeda SSN : xxx-xx-9916

Institution Credit **Transcript Totals**

Transcript Data

STUDENT INFORMATION

Curriculum Information

Current Program

Doctor of Philosophy

College: College of Science

Major and Department: Zoology, Zoology

***Transcript type:WWW is NOT Official ***

DEGREES AWARDED

Doctorate awarded: Doctor of Philosophy **Degree Date:** Dec 07, 2012

Curriculum Information

Major: Zoology

Doctoral Dissertation: Connecting Microevolutionary Processes to Macroevolutionary Patterns Across Space and Time

Comments: MP:

INSTITUTION CREDIT -Top-

Term: Fall 2006

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	507	02	SEM/GRANT WRITING	P	1.000	0.00	I
Z	507	02	SEMINAR/DEPARTMENTAL SEMINAR	P	1.000	0.00	I
Z	599	02	ST/QUANT GENETICS & EVOLUTION	A	3.000	12.00	I
Z	603	02	THESIS	R	11.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	3.000	12.00	4.00
Cumulative:	16.000	16.000	16.000	3.000	12.00	4.00

Unofficial Transcript

Term: Winter 2007

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
GEO	565	02	GEOGRAPHIC INFO SYSTEMS & SCI	A	3.000	12.00	
ST	511	02	METHODS OF DATA ANALYSIS	A	4.000	16.00	
Z	556	02	PHYLOGENETICS	A	4.000	16.00	
Z	603	02	THESIS	R	5.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	11.000	44.00	4.00
Cumulative:	32.000	32.000	32.000	14.000	56.00	4.00

Unofficial Transcript

Term: Spring 2007

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R

ST	512	02	METHODS OF DATA ANALYSIS	A	4.000	16.00
Z	573	02	BIOLOGY OF AMPHIBS & REPTILES	A	3.000	12.00
Z	574	02	SYSTEMATIC HERPETOLOGY	A	2.000	8.00
Z	603	02	THESIS	R	7.000	0.00

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	9.000	36.00	4.00
Cumulative:	48.000	48.000	48.000	23.000	92.00	4.00

Unofficial Transcript

Term: Summer 2007

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	3.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	3.000	3.000	3.000	0.000	0.00	0.00
Cumulative:	51.000	51.000	51.000	23.000	92.00	4.00

Unofficial Transcript

Term: Fall 2007

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
ST	521	02	INTRO TO MATHEMATICAL STATS	A	4.000	16.00	
Z	507	02	SEM/SCIENTIFIC SKILLS	P	1.000	0.00	I
Z	599	02	ST/ EVOL BIOL: TOOLS OF TRADE	A	3.000	12.00	I
Z	603	02	THESIS	R	8.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA

Current Term:	16.000	16.000	16.000	7.000	28.00	4.00
Cumulative:	67.000	67.000	67.000	30.000	120.00	4.00

Unofficial Transcript

Term: Winter 2008

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
ST	543	02	APPLIED STOCHASTIC MODELS	A-	3.000	11.10	
Z	507	02	SEM/ SEXUAL CONFLICT	P	1.000	0.00	I
Z	507	02	SEM/ECOL & EV OF LIFE HISTORIE	P	1.000	0.00	I
Z	603	02	THESIS	R	11.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	3.000	11.10	3.70
Cumulative:	83.000	83.000	83.000	33.000	131.10	3.97

Unofficial Transcript

Term: Spring 2008

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	16.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	99.000	99.000	99.000	33.000	131.10	3.97

Unofficial Transcript

Term: Summer 2008

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	3.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	3.000	3.000	3.000	0.000	0.00	0.00
Cumulative:	102.000	102.000	102.000	33.000	131.10	3.97

Unofficial Transcript

Term: Fall 2008

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	16.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	118.000	118.000	118.000	33.000	131.10	3.97

Unofficial Transcript

Term: Winter 2009

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
ST	522	02	INTRO TO MATHEMATICAL STATS	A	4.000	16.00	
Z	603	02	THESIS	R	12.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	4.000	16.00	4.00
Cumulative:	134.000	134.000	134.000	37.000	147.10	3.97

Unofficial Transcript

Term: Spring 2009

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	505	02	R&C/ BIOLOGICAL NOMENCLATURE	P	1.000	0.00	
Z	603	02	THESIS	R	15.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	150.000	150.000	150.000	37.000	147.10	3.97

Unofficial Transcript

Term: Summer 2009

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	3.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	3.000	3.000	3.000	0.000	0.00	0.00
Cumulative:	153.000	153.000	153.000	37.000	147.10	3.97

Unofficial Transcript

Term: Fall 2009

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	16.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	169.000	169.000	169.000	37.000	147.10	3.97

Unofficial Transcript

Term: Winter 2010

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	16.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	185.000	185.000	185.000	37.000	147.10	3.97

Unofficial Transcript

Term: Spring 2010

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
ST	513	02	METHODS OF DATA ANALYSIS	A	4.000	16.00	
Z	507	02	SEM/HOST-PATHOGEN COEVOLUTION	W	1.000	0.00	
Z	603	02	THESIS	R	11.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	15.000	15.000	4.000	16.00	4.00
Cumulative:	201.000	200.000	200.000	41.000	163.10	3.97

Unofficial Transcript

Term: Summer 2010

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
BI	603	02	THESIS/DISSERTATION	R	9.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	9.000	9.000	9.000	0.000	0.00	0.00
Cumulative:	210.000	209.000	209.000	41.000	163.10	3.97

Unofficial Transcript

Term: Fall 2010

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
AHE	507	02	SEM/ GTA TRAINING, DEVELOPMENT	P	1.000	0.00	
Z	603	02	THESIS	R	15.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	226.000	225.000	225.000	41.000	163.10	3.97

Unofficial Transcript

Term: Winter 2011

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	599	02	ST/ SCNTFC TCHING & LAB DESIGN	A	2.000	8.00	I
Z	603	02	THESIS	R	14.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	2.000	8.00	4.00
Cumulative:	242.000	241.000	241.000	43.000	171.10	3.97

Unofficial Transcript

Term: Spring 2011

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
PAC	159	02	DANCE:BALLROOM I/MEN	A	1.000	4.00	
Z	603	02	THESIS	R	15.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	1.000	4.00	4.00

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Cumulative:	258.000	257.000	257.000	44.000	175.10	3.97

Unofficial Transcript

Term: Summer 2011

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
BI	603	02	THESIS/DISSERTATION	R	9.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	9.000	9.000	9.000	0.000	0.00	0.00
Cumulative:	267.000	266.000	266.000	44.000	175.10	3.97

Unofficial Transcript

Term: Fall 2011

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
PAC	158	02	DANCE: BEGINNING SWING/MEN	A	1.000	4.00	
Z	603	02	THESIS	R	15.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	1.000	4.00	4.00
Cumulative:	283.000	282.000	282.000	45.000	179.10	3.98

Unofficial Transcript

Term: Winter 2012

College: College of Science

Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	507	02	SEM/ GENOMICS IN ECOLGY & EVOL	P	1.000	0.00	I
Z	603	02	THESIS	R	15.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA

Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	299.000	298.000	298.000	45.000	179.10	3.98

Unofficial Transcript

Term: Spring 2012

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	16.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	0.000	0.00	0.00
Cumulative:	315.000	314.000	314.000	45.000	179.10	3.98

Unofficial Transcript

Term: Summer 2012

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
BI	603	02	THESIS/DISSERTATION	R	9.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	9.000	9.000	9.000	0.000	0.00	0.00
Cumulative:	324.000	323.000	323.000	45.000	179.10	3.98

Unofficial Transcript

Term: Fall 2012

College: College of Science
Major: Zoology

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
Z	603	02	THESIS	R	3.000	0.00	

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	3.000	3.000	3.000	0.000	0.00	0.00

Cumulative:	327.000	326.000	326.000	45.000	179.10	3.98

Unofficial Transcript

TRANSCRIPT TOTALS (GRADUATE) **-Top-**

Level Comments: Doctor of Philosophy degree requirements completed October 24, 2012

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Total Institution:	327.000	326.000	326.000	45.000	179.10	3.98
Total Transfer:	0.000	0.000	0.000	0.000	0.00	0.00
Overall:	327.000	326.000	326.000	45.000	179.10	3.98

Unofficial Transcript

RELEASE: 8.4.1