

# Arturo Valdivia

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## Education

- Ph.D., Arizona State University, Tempe, Arizona Fall 2013  
Major: Statistics  
Dissertation: *Alternative Methods via Random Forest to Identify Interactions in a General Framework and Variable Importance in the Context of Value-Added Models.*  
Chair: Randall Eubank
- M.S., Arizona State University, Tempe, Arizona Spring 2005  
Major: Economics
- B.S., Universidad Católica Boliviana, La Paz, Bolivia Fall 2003  
Major: Business Administration, Economics

## Teaching-related Activities

### Teaching Positions

- Senior Lecturer, Department of Statistics August 2019 –present  
Indiana University, Bloomington IN
- Lecturer, Department of Statistics August 2013 –July 2019  
Indiana University, Bloomington IN
- Instructor, School of Mathematical and Statistical Sciences August 2011 –August 2012  
Arizona State University, Tempe AZ
- Statistics Lab Consultant, School of Mathematical and Statistical Sciences August 2010 –May 2011  
Arizona State University, Tempe AZ
- Interim Lecturer of Macroeconomics May 2006 –April 2006  
Mesa Community College, Mesa, AZ
- Interim Lecturer of Microeconomics September 2002 –October 2002  
Universidad Católica Boliviana, La Paz, Bolivia

### Teaching Publications

- Ismay, Ch., Kim, A., **Valdivia, A.** (2025) *Statistical Inference via Data Science. A ModernDive into R and the Tidyverse. 2nd Ed.* CRC Press.

### Teaching Workshops and Presentations

- Valdivia, A.**, & Ismay, C. (2025, July). *Reimagining intro stats through data science: A hands-on approach with ModernDive.* Workshop presented at 2025 USCOTS, Aimes, IA.
- Valdivia, A.**, & Ismay, C. (2025, July). *Spark curiosity: LLM-driven strategies for teaching and learning with data.* Workshop presented at 2025 USCOTS, Aimes, IA.

**Valdivia, A., & Ismay, C.** (2025, June). *Statistical Inference via Data Science with R*. Workshop presented at the 2025 WNAR/IMS Annual Meeting, Whistler, BC, Canada.

**Valdivia, A., & Ismay, C.** (2025, June). *LLM-Driven Analysis and Reporting with R*. Workshop presented at the 2025 WNAR/IMS Annual Meeting, Whistler, BC, Canada.

**Valdivia, A.** (2018, August). *Using simulation processes to close the background gap among students*. Paper presented at the Joint Statistical Meeting, Vancouver, Canada.

**Valdivia, A. & Svetina, D.** (2017, August). *Teaching sampling and confidence intervals through active engagement and learning*. Poster presented at the annual meeting of the American Psychological Association, Washington, DC.

## Courses Taught

### STAT-S 520 – Introduction to Statistics

Taught to 399 students in 16 sections (summer 2017 - summer 2025).

Curriculum development: Revised and redesigned many times, including online asynchronous learning (summer 2020), adding a simulation-based approach for inference (fall 2022).

### STAT-S 631 – Applied Linear Models I

Taught to 262 students in 11 sections (fall 2014 - fall 2025).

Curriculum development: First taught in fall 2014. Revised and redesigned a number of times, including online asynchronous learning (fall 2020) and major redesign (fall 2024).

### STAT-S 632 – Applied Linear Models II

Taught to 226 students in 11 sections (spring 2015 - spring 2025).

Curriculum development: First taught in spring 2015. Revised and redesigned many times, including online asynchronous learning (spring 2021), flipped classroom (spring 2022), and a mastery-based approach for grading (spring 2022).

### STAT-S 350 – Introduction to Statistical Inference

Taught to 295 students in 11 sections (summer 2017 - summer 2025).

Curriculum development: First taught in summer 2017. Revised or redesigned a few times, including online synchronous learning (fall 2020).

### STAT-S 519 – A Gentle Introduction to Statistics in R

Taught to 49 students in 3 sections (summer 2024 - fall 2025).

Curriculum development: Developed the course as an 8-week online asynchronous course (fall 2025).

### STAT-S 530 – Biometry

Taught to 6 students in 1 section (spring 2025).

Curriculum development: Revised the course (spring 2025).

Offered concurrently with STAT-S 330 (2 students, 1 section in spring 2025)

### STAT-S 352 – Data Modeling and Inference

Taught to 26 students in 1 section (fall 2014)

Curriculum development: Redesigned in fall 2014.

### STAT-S 303 – Statistics for the Life Sciences

Taught to 478 students in 11 sections (summer 2016 - fall 2024).

Curriculum development: Revised or redesigned a few times, including online asynchronous learning (summer 2020) and major redesign (fall 2024)

## STAT-S 303 – Statistics for Speech and Hearing Sciences

Taught to 354 students in 14 sections (fall 2014 - fall 2022).

Curriculum development: Developed in spring 2014 and first taught in fall 2014. Revised or redesigned many times, including online asynchronous learning (spring 2022) and a flipped classroom (spring 2022).

## STAT-S 432 – Applied Linear Models II

Taught to 50 students in 6 sections (spring 2015 - spring 2025). Offered concurrently with STAT-S 632.

## STAT-S 431 – Applied Linear Models I

Taught to 129 students in 7 sections (fall 2014 - fall 2025). Offered concurrently with STAT-S 631.

## STAT-S 695 – Readings in Statistics

I've worked with Joe Stoica during the fall 2020 on the theory of linear models, beyond what we have covered earlier in STAT-S 631 and STAT-S 632.

## STAT-S 100 – Statistical Literacy (54 students, 2 sections: fall 2013, spring 2014)

## STAT-S 301 – Statistics for Business (407 students, 6 sections between spring 2014 and summer 2016)

## STAT-S 681 – Topics in Statistical Machine Learning (15 students, 1 section: fall 2013)

## Mentoring

Member of the Dissertation Committee for Daniel Kaiser October 2020 –April 2025

Daniel obtained his Ph.D. in Complex Networks and Systems (School of Informatics) at Indiana University

Member of the Dissertation Committee for Jiangqiong Li January 2020 –October 2023

Jiangqiong obtained her Ph.D. in Quantitative Research Methodology (Dept. of Counseling & Educational Psychology) and a M.S. in Applied Statistics (Dept. of Statistics), both at Indiana University

Member of the Dissertation Committee for Stephanie Underhill August 2020 –April 2022

Stephanie obtained her Ph.D. in Inquiry Methodology (Dept. of Counseling & Educational Psychology)

Member of the Dissertation Committee for Justin Paulsen October 2018 –May 2019

Justin obtained his Ph.D. in Inquiry Methodology, Dept. of Counseling & Educational Psychology, Indiana University.

Statistics minor advisor for Tanner Phillips June 2020 –Feb 2022

Tanner is pursuing a Ph.D. in Instructional Systems Technology (Dept. of Instructional Systems Technology) and a M.S. in Applied Statistics (Dept. of Statistics), both at Indiana University

## Course Design in Progress

STAT-S 100 – ModernDive: Data Exploration and Storytelling

Developing this new course to be offered as an ASURE Discovery Experience in fall 2026.

STAT-S 631 – Applied Linear Models

Developing this new course as the applied part of the previous 2-course sequence S631 and S632, to be offered starting in fall 2026.

To be offered concurrently with STAT-S 431.

STAT-S 632 – Theory of Linear Models

Developing this new course as the theory part of the previous 2-course sequence S631 and S632, to be offered starting in spring 2027.

To be offered concurrently with STAT-S 432.

## Teaching Manuscripts in Progress

**Valdivia, A.M.** *Simulations for Linear Models: Using simulation processes to motivate the understanding of Generalized Linear Models and Mixed Linear Models*

**Valdivia, A.M.** *Leveling the field: Using simulation processes to teach statistics to students with differing math backgrounds.* Manuscript in preparation.

**Valdivia, A.M. & Svetina, D.** *Teaching sampling and confidence intervals through active engagement and learning.* Manuscript in preparation.

## Service-related Activities

### Administrative Positions

Director of Undergraduate Studies, Department of Statistics  
Indiana University, Bloomington IN August 2023 –present

Director of Undergraduate Studies, Department of Statistics  
Indiana University, Bloomington IN August 2018 –July 2020

Co-Director of Undergraduate Studies, Department of Statistics  
Indiana University, Bloomington IN August 2014 –July 2018

Developed Minor in Statistics; curriculum development, coordination, and other related activities for Undergraduate Studies

### Committees Participation

College Academic Fairness Committee, College of Arts + Sciences, IU January 2025 – present

Undergraduate Studies Committee, Department of Statistics, IU August 2013 – present

Data Science Curriculum Committee (DSCC), Data Science, IU August 2025 – present

Lecturer Search Committee, Department of Statistics, IU January 2013 – Fall 2024

Data Sciences Admissions Committee, IU Fall 2017 – July 2020

Visiting Professor Search Committee, Department of Statistics, IU 2016 – 2020

Lecturer Search Committee, Department of Statistics, IU 2015

Member of the Program Assessment Planning Team for the Department of Statistics, IU 2014

Co-Developer of the Program Assessment Plan for the Department of Statistics, IU 2014

ISCC Search Committee, Indiana Statistical Consulting Center, IU 2014

## Research-related Activities

### Research Experience

Research Associate, School of Mathematical and Statistical Sciences Arizona State University, Tempe AZ	Summer 2010, 2011
Research Associate, Center for the Future of Arizona Arizona State University, Tempe AZ	August 2009 –June 2010
Research Associate, Arizona Prevention Resource Center Arizona State University, Tempe AZ	January 2005 –May 2009

### Published Work

(† = Work with Students)

†Svetina, D., Feng, Y., Paulsen, J., Valdivia, M., **Valdivia, A.**, & Dai, S. (2018). Examining DIF in the context of CDMs when the Q-matrix is Misspecified. *Frontiers in Psychology*. Advance online publication. doi: 10.3389/fpsyg.2018.00696 (**ISI impact: 2.32**)

**Valdivia, A.** (2017) Book review: Yee, T. W. (2015) *Vector generalized linear and additive models: With an Implementation in R*. New York, NY: Springer Series in Statistics. In Reviews of Books and Teaching Materials, *The American Statistician*, 71:4, 369-372, doi: 10.1080/00031305.2017.1395630

†Svetina, D., **Valdivia, A.**, Underhill, S., Dai, S., & Wang, X. (2017). Recovery of parameters in multidimensional item response theory models under complexity and nonnormality. *Applied Psychological Measurement*, 41 (7), 530-544. doi: 10.1177/ 0146621617707507

Wolfersteig, W., **Valdivia, A.**, & Katz, L. (2009). *Key factors for effective implementation of school curricula: Achieving success in Reading First outcomes*. Arizona Department of Education.

### Manuscripts in Progress

**Valdivia, A.** *Methods to Detect Interactions in Random Forest Using the Tree Structure Approach*. Manuscript in preparation for publication.

**Valdivia, A.** *A Data Mining Approach to Value-Added Models*. Manuscript in preparation for publication.

Svetina, D., & **Valdivia, A.** *Heuristic, machine-learning based measure to detect violations of local independence in IRT*. Manuscript in preparation for publication.

### Presentations

(† = Work with Students)

†Svetina, D., Feng, Y., Paulsen, J., Valdivia, M., **Valdivia, A.**, & Dai, S. (2018, April). *Examining DIF in the context of CDMs when q-matrix is misspecified*. Paper presented at the the 2018 Annual Meeting of the National Council on Measurement in Education, New York City, NY.

**Valdivia, A.** & Svetina, D. (2017, August). *Heuristic, machine-learning based measure to detect violations of local independence in IRT*. Poster presented at the annual meeting of the American Psychological Association, Washington, DC.

†Underhill, S., Svetina, D., **Valdivia, A.**, Dai, S., & Wang, X. (2016, April). *Parameter recovery in multidimensional item response theory models under complexity and nonnormality*. Paper presented at the National Council on Measurement in Education, Washington, DC.

**Valdivia, A.** (2014, August). *Novel methods to identify and estimate interactions via random forest*. Paper presented at the 2014 Joint Statistical Meeting, Boston, MA.

**Valdivia, A.** (2013, November). *Alternative methods via random forest to determine variable importance and interactions*. Paper presented at the Department of Statistics, Indiana University, Bloomington, IN.

**Valdivia, A.** (2012, July). *A Data mining approach to value-added models*. Paper presented at the 2012 Joint Statistical Meeting, San Diego, CA.

**Valdivia, A.** (2011, May). *Data mining methods for assessing teacher, school and program effectiveness*. Poster presented at the 2011 SIAM International Conference on Data Mining, Mesa, AZ.

Valdivia, W., & **Valdivia, A.** (2009, October). *Competitive market structures and exclusive licensing*. Paper presented at the Atlanta Conference on Science and Innovation Policy, Atlanta GA.

Wolfersteig, W., **Valdivia, A.**, & Katz, L. (2009, October). *Key factors for effective implementation of school curricula: Achieving success in Reading First outcomes*. Paper presented at the Arizona Department of Education.

## Technical Reports

Wolfersteig, W., Moratto, M., Katz, L., & **Valdivia, A.** (2009). *Arizona Reading First - Final External Evaluation Report*. Arizona Prevention Resource Center. Arizona State University.

Holley, P., **Valdivia, A.**, Katz, L., & Ruiz, C. (2007). *Final Evaluation Safe Schools/ Healthy Students Program Yuma Elementary School District One*. Arizona Prevention Resource Center. Arizona State University.

Holley, P., Rutledge, G., & **Valdivia, A.** (2007). *Annual Evaluation Safe Schools/ Healthy Students Program Yuma Elementary School District One*. Arizona Prevention Resource Center. Arizona State University.

Holley, P., Rutledge, G., & **Valdivia, A.** (2006). *Annual Evaluation Safe Schools/ Healthy Students Program Yuma Elementary School District One*. Arizona Prevention Resource Center. Arizona State University.

## Research Interests

Statistical Education

Statistical Learning: Random Forest and Rule Based Ensembles

Generalized Linear Mixed Models

Item Response Theory

## **Awards and Nominations**

Recipient of the IU Trustees Teaching Award	2023
Nominated for the IU Trustees Teaching Award	2019, 2021, 2022
Scholarship for studies in Arizona, Foundation Simon I. Patiño	2003
Scholarship for Academic Excellence, Universidad Católica Boliviana	1998, 1999

## **Professional Memberships**

American Statistical Association	2011 – 2022
Society for Industrial and Applied Mathematics	2011 – 2014

Last updated: January 2026