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EDUCATION

MAY 2020 (EXPECTED)
Ph.D., Biostatistics, University of Pennsylvania, Philadelphia, PA.
Advisors: Drs. Russell [Taki] Shinohara and Kristin Linn
Thesis Title: Comprehensive Multiple Sclerosis Lesion Analysis Methods for Magnetic Resonance Imaging

2017
M.S., Biostatistics, University of Pennsylvania, Philadelphia, PA.
Advisor: Dr. Russell [Taki] Shinohara
Thesis Title: MIMoSA: An Automated Method for Intermodal Segmentation Analysis of Multiple Sclerosis Brain Lesions

2015
B.A., Biology and Statistics (Honors), University of Connecticut, Storrs, CT.
Advisor: Dr. Ofer Harel
Thesis Title: Estimating causal effects in incomplete observational studies using multiple imputation and propensity score analysis: A simulation study

Fall 2013
Universidad de Granada, Granada, Spain (**Study Abroad**)

EXPERIENCE

2016-Present
Research Assistant
University of Pennsylvania DBEI
Principal Investigators: Drs. Russell [Taki] Shinohara and Kristin Linn

- Exploring statistical methods to understand and quantify white matter lesion detection progression in multiple sclerosis.
- Developing software applications and packages for implementation of novel algorithms in R.

2015-2017
Lab Rotations
University of Pennsylvania DBEI

- Assessed the activation of varying regions of interest in fMRI data to determine the pain network for those on placebo versus pain management medications. Advised by Dr. Haochang Shou.
- Identified and quantified the correlation structure across imaging modalities for lesion detection in multiple sclerosis. Advised by Dr. Russell [Taki] Shinohara.
- Conducted a multi-level simulation study to evaluate effect size and power under opt-in and opt-out consent approaches for behavioral trials. Advised the Empower behavioral trial aimed at helping cardiac heart failure patients stay healthy after they are discharged from the hospital. Advised by Dr. Andrea Troxel.

2014-2015	**Research Assistant**

University of Connecticut, Department of Statistics
Principal Investigator: Ofer Harel

- Examined the effects of missing data on propensity score analysis.
- Applied various propensity score analysis methods on Intervention Prevention Program HIV data collected in South Africa.

2014-2015	**Research Assistant**

Dordt College, Research Internship in Statistical Genetics
Principal Investigator: Dr. Nathan Tintle

- Collaborated with a team of students and faculty on NIH and NSF funded projects in post-hoc rare variant association testing after gene-based tests of association.

2013-2014	**Research Assistant**

University of Connecticut, Department of Allied-Health
Principal Investigator: Dr. Tania Huedo-Medina

- Implemented analyses exploring the relationship between exercise intervention in cancer patients and the effects on anxiety and depression.
- Served as a short-term statistical consultant in areas such as study design and data analysis for the Department of Allied Health students and faculty.

PUBLICATIONS

Valcarcel, A.M., Linn, K.A., Khalid, F., Vandekar, S.N., Tauhid, S., Satterthwaite, T.D., Muschelli, J., Bakshi, R., Shinohara, R.T.: MIMoSA: An Approach to Automatically Segment T2 Hyperintense and T1 Hypointense Lesions in Multiple Sclerosis. In: Crimi, A., Bakas, S., Kuijf, H., Keyvan, F., Reyes, M., and van Walsum, T. (eds.) Brainlesion: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries. pp. 47–56. Springer International Publishing (2019).

Valcarcel, A.M., Linn, K.A., Khalid, F., Vandekar, S.N., Tauhid, S., Satterthwaite, T.D., Muschelli, J., Martin, M.L., Bakshi, R., Shinohara, R.T.: A dual modeling approach to automatic segmentation of cerebral T2 hyperintensities and T1 black holes in multiple sclerosis. NeuroImage: Clinical. 20, 1211–1221 (2018).

Valcarcel, A.M., Linn, K.A., Vandekar, S.N., Satterthwaite, T.D., Muschelli, J., Calabresi, P.A., Pham, D.L., Martin, M.L., Shinohara, R.T.: MIMoSA: An Automated Method for Intermodal Segmentation Analysis of Multiple Sclerosis Brain Lesions. Journal of Neuroimaging. 28, 389–398 (2018).

Fleishman, G.M., **Valcarcel, A.**, Pham, D.L., Roy, S., Calabresi, P.A., Yushkevich, P., Shinohara, R.T., Oguz, I.: Joint Intensity Fusion Image Synthesis Applied to Multiple Sclerosis Lesion Segmentation. In: Crimi, A., Bakas, S., Kuijf, H., Menze, B., and Reyes, M. (eds.) Brainlesion: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries. pp. 43–54. Springer International Publishing (2018).

Grinde, K.E., Arbet, J., Green, A., O'Connell, M., **Valcarcel, A.**, Westra, J., Tintle, N.: Illustrating, Quantifying, and Correcting for Bias in Post-hoc Analysis of Gene-Based Rare Variant Tests of Association. Front. Genet. 8, (2017).

Valcarcel, A., Grinde, K., Cook, K., Green, A., Tintle, N.: A multistep approach to single nucleotide polymorphism–set analysis: an evaluation of power and type I error of gene-based tests of association after pathway-based association tests. BMC Proc. 10, 349–355 (2016).

Green, A., Cook, K., Grinde, K., **Valcarcel, A.**, Tintle, N.: A general method for combining different family-based rare-variant tests of association to improve power and robustness of a wide range of genetic architectures. BMC Proc. 10, 165–170 (2016).

MANUSCRIPTS IN PROGRESS

Valcarcel, A., Muschelli, J., Crainiceanu, C., Pham, D., Calabresi, P., Martin, M.L., Bakshi, R., & Shinohara, R. (2019). TAPAS: Threshold Adjustment to Probability Map Automatic Segmentation. *In progress*.

ORAL PRESENTATIONS

2019 TAPAS: A Thresholding Adjustment to Probability Map Automatic Segmentation. Department of Biostatistics, Epidemiology and Informatics (DBEI) Research Day; Philadelphia, PA.

2018 ADAPT: A Dynamic Approach to Probability Thresholding Based on Healthy Controls. International Biometric Conference; Barcelona, Spain.

2018 MIMoSA: A Method for Inter-Modal Segmentation Analysis of T2 Hyperintensities and T1 Black Holes in Multiple Sclerosis. Statistical Methods in Imaging Conference; Philadelphia, PA.

2017 MIMoSA: A Method for Inter-Modal Segmentation Analysis.

- ENAR Spring Meeting; Washington D.C.
- Joint Statistical Meetings; Baltimore, MD.

2016 An evaluation of treatment effect in opt-in versus opt-out consent frameworks under a mixture of patient motivation levels. Joint Statistical Meetings; Chicago, Illinois.

2014 Identifying and correcting for bias in post-hoc ranking strategies: an application to gene-based tests of association. University of Michigan; Ann Arbor, Michigan.

POSTER PRESENTATIONS

2019 rtapas: An R Package to Implement Thresholding Adjustment to Probability Map Automatic Segmentation (TAPAS). useR!; Toulouse, France.

2018	TAPAS: A Thresholding Adjustment to Probability Map Automatic Segmentation. European Committee for Treatment and Research in Multiple Sclerosis; Berlin, Germany.
2018	An Approach to Automatically Segment T2 Hyperintense and T1 Hypointense Lesions in Multiple Sclerosis. International Conference on Medical Image Computing & Computer Assisted Intervention BrainLes Workshop; Granada, Spain.
2018	ADAPT: A Dynamic Approach to Probability Thresholding Based on Healthy Controls. Joint Statistical Meetings; Vancouver, Canada.
2017-2018	MIMoSA : A Method for Inter-Modal Segmentation Analysis of T2 Hyperintensities and T1 Black Holes in Multiple Sclerosis."

- European Committee for Treatment and Research in Multiple Sclerosis; Paris, France.
- Americas Committee for Treatment and Research in Multiple Sclerosis; San Diego, California.
- ENAR Spring Meeting; Atlanta, GA; March 2018.
- Statistical Methods in Imaging Conference; Philadelphia, PA.

2015	Estimating causal effects in incomplete observational studies using multiple imputation and propensity score analysis: A simulation study. University of Connecticut Frontiers in Undergraduate Research; Storrs, Connecticut.
2014	A multi-step approach to SNP-set analysis: An evaluation of power and type I error of gene-based tests of association after pathway-based tests. Genetic Analysis Workshop 19; Vienna, Austria.

SOFTWARE

2019	**Valcarcel, A.**, Muschelli J., "NiftiArray: Fast Random Access of NIfTI Objects" R package available on GitHub. *In progress for Neuroconductor*.
2019	**Valcarcel, A.**,"rtapas: An R Package to Implement Thresholding Adjustment to Probability Map Automatic Segmentation (TAPAS)." R package available on Neuroconductor and GitHub.
2018	**Valcarcel, A.**,"aliviateR: An R Package to Make R Packages and Simplify Life." R package available on GitHub.
2018	**Valcarcel, A.** "Game of Thrones (GoT): A Network Analysis" Shiny application available at https://alval.shinyapps.io/got_shiny/.
2018	**Valcarcel, A.**,"GoT: Scrape Game of Thrones Data." R package available on GitHub.
2017	**Valcarcel, A.**, & Shinohara, R.T., "mimosa: A Method for Inter-Modal Segmentation Analysis." R package available on Neuroconductor and GitHub.

REFEREE/REVIEWER

- Journal of Neuroimaging
- Statistics in Medicine

ACADEMIC HONORS AND AWARDS

2019   useR! Diversity Scholarship recipient, Toulouse, France.

2019   Selected as a top 10 abstract winner for the Department of Biostatistics, Epidemiology, and Informatics Research Day, Philadelphia, PA.

2018   Student travel award to attend and present research at the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS), Berlin, Germany.

2018   Best Student Abstract Award at Statistical Methods in Imaging Conference sponsored by the American Statistical Association, Philadelphia, PA.

2018   Student travel award to attend and present research at Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS), San Diego, California.

2017   Student travel award to attend and present research at the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS), Paris, France.

2015   Undergraduate Statistics Project Competition (USPROC) Honorable Mention in the USRESP competition, Theoretical category, American Statistical Association (ASA) and The Consortium For The Advancement of Undergraduate Statistics Education (CAUSE).

2015   Honors Scholar in Statistics, University of Connecticut.

2014   Student travel award to attend and present research at Genetic Analysis Workshop 19, Vienna, Austria.

TEACHING EXPERIENCE

2017-2018   **Instructor**
University of Pennsylvania, DBEI

- Created content and facilitated a summer workshop to teach incoming biostatistics and epidemiology graduate students important concepts and skills in computer programming specific to the Stata statistical software package.

2018   **Instructor**
Statistical Methods in Imaging, R-Hack-A-Pack

- Assisted in co-organizing a workshop on the development and maintenance of R packages for dissemination of statistical methodology in imaging analysis.
- Served as an expert volunteer providing assistance and feedback to groups creating packages.

2016-2018   **Teaching Assistant**
University of Pennsylvania
Introduction to Statistics for Health Policy (HPR 604)
- Responsible for holding weekly office hours and participated in grading homework and exams for graduate level introductory statistics course.
- Created and taught bi-weekly Stata lab lectures and assignments.

2014-2015   **Library Tutor in Mathematics Center (Q-Center)**
University of Connecticut

- Provided direct assistance to students via peer tutoring, review sessions, and the creation of innovative learning tools.

2013-2015   **Substitute Teacher**
Hopewell Valley Regional School District

SERVICE AND LEADERSHIP

2017-2020   ***Council for Emerging and New Statisticians (CENS)***
Eastern North American Region (ENAR) Regional Advisory Board (RAB)
- Council member 2017-2018, Steering Committee member (2018-2019), Steering Committee Co-Chair (2019-2020).
- Advise RAB on how ENAR can better serve graduate students and recent graduates.
- Coordinated a proposal for an invited session at the ENAR Meeting as well as plan activities for ENAR members throughout the year and at the meeting.

2016-Present   **Admissions Student Representative**
University of Pennsylvania DBEI
- Organize and chair student activities and information sessions between current students and interviewees.

2016-Present   **Recruitment Committee**
University of Pennsylvania DBEI
- Counsel faculty on modern recruitment strategies for potential applicants and recruits.
- Present recruitment talks to various groups around Penn as well as nearby universities.

2016-2019 **BGSA Student Representative**
University of Pennsylvania Biomedical Graduate Student Association
- Participate in monthly meetings to discuss college wide activities and issues including unionization of graduate students and budgeting.
- Planned monthly student activities to foster relationships among biostatistics and epidemiology graduate students.

2018-2019 **Innovative Ideas Committee**
University of Pennsylvania Biomedical Graduate Studies (BGS)
- Advised BGS faculty on how to better serve graduate students using innovative and novel approaches to streamline the transition from undergraduate to graduate student.

2018-2019 **Digital Program Chair**
ENAR Spring Meeting
- Programmed the ENAR mobile application conference content (e.g. conference schedule, abstracts, and special events).

2011-2015 **Alpha Beta Epsilon**
University of Connecticut
- *Parliamentarian*: Expert in rules of order, procedures, and conduct at meetings and assemblies to maintain the pillars of academics, service and brotherhood on which the fraternity was founded.
- *Pledging Officer:* Introduced and educated new pledging members on community service and academic involvement of the fraternity.
- *Rush Chair*: Facilitated, organized, and promoted activities to recruit and incorporate members to the fraternity.

2012-2013 **Orientation Leader**
University of Connecticut, Husky Week Of Welcome
- Led orientation workshops for freshman and transfer students about study strategies and becoming involved around campus.

2012-2015 **Participant/Dancer and Morale Captain**
Connecticut Children's Medical Center HuskyTHON Dance Marathon
- Responsible for executing various fundraisers in year round events such as canning, bake sales, solicit donations from local businesses.

PROFESSIONAL AFFILIATIONS

- Eastern North American Region of the International Biometric Society
- American Statistical Association

COMPUTATIONAL EXPERTISE

- **Expertise**: R
- **Working Knowledge**: SAS, bash scripting, MATLAB, Stata, HTML, css
- **Applications**: LaTeX, Microsoft Office, knitr, RMarkdown, StatWeave, GitHub