

## Alessandra [Ali] Valcarcel

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### Education

**University of Pennsylvania**, Philadelphia, PA **May 2020** (anticipated)  
**Perelman School of Medicine**  
**PhD Candidate, *Biostatistics***  
Dissertation Advisor: Dr. Russell T. Shinohara

**University of Pennsylvania**, Philadelphia, PA **May 2017**  
**Perelman School of Medicine**  
**M.S. *Biostatistics***

**University of Connecticut**, Storrs, CT **May 2015**  
Cumulative GPA: 3.784/4.00  
**B.A. *Biology and Statistics (Honors Scholar and Magna Cum Laude)***

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

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### RESEARCH EXPERIENCE

#### ***Research Assistant, (September 2016-Present)***

University of Pennsylvania DBEI

*Principal Investigator:* Dr. Russell Shinohara

- Exploring methods in automated white matter lesion detection in multiple sclerosis
- Developing software packages for implementation of novel algorithms in R
- Participate weekly in PennSIVE group research meetings

#### ***Lab Rotation, (June 2016 – January 2016)***

University of Pennsylvania DBEI

*Principal Investigator:* Dr. Haochang Shou

- Assessed the activation of varying regions of interest in fMRI data to determine the pain network for those on placebo versus pain management medications

#### ***Lab Rotation, (January 2016-June 2016)***

University of Pennsylvania DBEI

*Principal Investigator:* Dr. Russell Shinohara

- Evaluated whether the correlation structure across images of the same location, which is known to differ across tissue types, is informative for detecting lesions with increased accuracy

**Lab Rotation, (September 2015-January 2016)**

University of Pennsylvania DBEI

*Principal Investigator:* Dr. Andrea Troxel

- Conducted a multi-level simulation study to evaluate effect size and power under opt-in and opt-out consent approaches for behavioral trials
- Participated in weekly meetings for the Empower behavioral trial aimed at helping cardiac heart failure patients stay healthy after they are discharged from the hospital.

**Research Investigator, (June 2014-May 2015)**

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

**Research Assistant, (January 2014-May 2015)**

University of Connecticut, Department of Statistics

*Principal Investigator:* Dr. Ofer Harel

- Independently examined the methods of propensity scores and the effects of missing data on propensity score analysis
- Applied the various methods of propensity score analysis on HIV data collected in South Africa on an Intervention Prevention Program

**Research Assistant, (January 2013-September 2013),**

University of Connecticut, Center for Health, Intervention, and Prevention

*Principal Investigator:* Dr. Tania Huedo-Medina

- Conducted analyses exploring the relationship between exercise intervention on various 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

**Research Investigator, (Spring 2013),**

University of Connecticut, Department of Allied Health

*Principal Investigator:* Dr. Tania Huedo-Medina

- Collaborated with a team of four from various academic backgrounds to conduct research exploring the factors related to childhood anxiety and obesity

## **PUBLICATIONS**

**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., Kuijff, 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.**, Linn, K., Khalid, F., Vandekar, S., Tauhid, S., Satterthwaite, T., Muschelli, J., Bakshi, R., & Shinohara, R. (2018). MIMoSA: An Approach to Automatically Segment T2 Hyperintense and T1 Hypointense Lesions in Multiple Sclerosis. *Brainlesion: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries*. *In press*.

**Valcarcel, A.**, Muschelli, J., Crainiceanu, C., Pham, D., Calabresi, P., Martin, M.L., Bakshi, R., & Shinohara, R. (2018). TAPAS: Threshold Adjustment to Probability Map Automatic Segmentation. *In progress*.

**Valcarcel, A.**, & Troxel, A. (2018). An evaluation of treatment effect in opt-in versus opt-out consent frameworks under a mixture of patient motivation levels. *In progress*.

### ORAL PRESENTATIONS

“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; 2018.

“MIMoSA: A Method for Inter-Modal Segmentation Analysis.” ENAR Spring Meeting; Washington D.C.; 2017. Joint Statistics Meetings; Baltimore, MD; 2017.

“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; 2017.

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

### POSTER PRESENTATIONS

“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; 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; October 2017. Americas Committee for Treatment and Research in Multiple Sclerosis; San Diego, California; February 2018. ENAR Spring Meeting; Atlanta, GA; March 2018. Statistical Methods in Imaging Conference; Philadelphia, PA; 2018.

“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; April 2015.

“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; August 2014.

## REFEREE/REVIEWER

- Journal of Neuroimaging

## SOFTWARE

**Valcarcel, A.**, “tapas: An R Package to Implement Thresholding Adjustment to Probability Map Automatic Segmentation (TAPAS).” *R package under development on GitHub and Neuroconductor*. 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/](https://alval.shinyapps.io/got_shiny/). 2018.

**Valcarcel, A.**, “GoT: Scrape Game of Thrones Data.” R package available on GitHub. 2018.

**Valcarcel, A.**, & Shinohara, R.T., “mimoso: A Method for Inter-Modal Segmentation Analysis.” R package available on Neuroconductor and GitHub. Nov 2017.

## ACADEMIC HONORS AND AWARDS

- Student travel award to attend and present research at the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS), Berlin, Germany, (*October 2018*)
- Best Student Abstract Award at Statistical Methods in Imaging Conference sponsored by the American Statistical Association, Philadelphia, PA (*June 2018*)
- Student travel award to attend and present research at Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS), San Diego, California (*February 2018*)

- Student travel award to attend and present research at the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS), Paris, France, (*October 2017*)
- Educational Fellowship Recipient, University of Pennsylvania (*2015- 2017*)
- 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), (*August 2015*)
- Honors Scholar in Statistics, University of Connecticut, (*May 2015*)
- Student travel award to attend and present research at Genetic Analysis Workshop 19, Vienna, Austria, (*August 2014*)

## TEACHING EXPERIENCE

### ***Lead Instructor, (Summers 2017 and 2018)***

University of Pennsylvania, DBEI

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

### ***Co-Organizer and Presenter, (May 2018)***

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
- Served as an expert volunteer to provide assistance and feedback to groups creating packages

### ***Teaching Assistant, (Fall Semesters 2016, 2017, and 2018)***

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 lectured bi-weekly lab lectures and assignments in Stata

### ***Library Tutor in Mathematics Center, (2014-2015)***

University of Connecticut

### ***Substitute Teacher, (2013-2015)***

Hopewell Valley Regional School District

## SERVICE AND LEADERSHIP

### ***Innovative Ideas Committee, (July 2018-Present)***

University of Pennsylvania Biomedical Graduate Studies (BGS)

- Advise BGS faculty on how to better serve graduate students using innovative and novel approaches to streamline the transition from undergraduate to graduate student

### ***Digital Program Chair, (March 2018-Present)***

ENAR Spring Meeting

- Responsible for the coordination of production of conference content (e.g. conference schedule, abstracts, and special events)

### ***Council for Emerging and New Statisticians (CENS), (May 2017-Present)***

ENAR Regional Advisory Board

- Advise RAB on how ENAR can better serve graduate students and recent graduates
- Organize a proposal for an invited session at ENAR Spring 2018 Meeting as well as plan activities for ENAR members throughout the year and at the meeting

***Admissions Student Representative, (January 2016-Present)***

University of Pennsylvania DBEI

- Organize and chair student activities and information sessions between current and interviewees

***Recruitment Committee, (August 2016-Present)***

University of Pennsylvania DBEI

- Collaborate with faculty regarding different recruitment strategies for potential applicants
- Present recruitment talk to various groups around Penn as well as nearby universities

***BGSA Student Representative, (August 2016-Present)***

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
- Organize monthly student activities to foster relationships among biostatistics and epidemiology graduate students

***Alpha Beta Epsilon, (2011-2015)***

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

***Orientation Leader, (August 2012, August 2013),***

University of Connecticut, Husky Week Of Welcome

- Led orientation workshops for freshman and transfer students about study strategies and becoming involved around campus

***Participant/Dancer and Morale Captain, (December 2012-March 2015)***

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