Alan Roberto Vazquez-Alcocer

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ACADEMIC POSITIONS

Department of Industrial Engineering,
University of Arkansas, U.S.A. 08/2022 - present
Assistant Professor

Department of Statistics,
University of California, Los Angeles, U.S.A. 10/2020 - 06/2022
Assistant Adjunct Professor

Department of Mathematics, Statistics and Computer Science,
University of Illinois at Chicago, Chicago, U.S.A. 03/2020
Visiting Researcher

Department of Biosystems, University of Leuven,
Belgium 06/2018 - 09/2020
Postdoctoral Researcher

Department of Statistics,
University of California, Los Angeles, U.S.A. 03/2017 - 06/2017
Visiting Graduate Researcher

Department of Engineering Management,
University of Antwerp, Belgium 05/2014 - 05/2018
Ph.D. Researcher

Mathematics Research Center CIMAT, Mexico 07/2012 - 01/2014
Research Assistant

EDUCATION

University of Antwerp, Belgium
Ph.D. in Applied Economics 05/2014 - 05/2018
Thesis: Orthogonal Experimental Designs for Screening: Construction and Analysis.
Advisors: Prof. Peter Goos and Dr. Eric Schoen.

Monterrey Institute of Technology, Mexico
M.S. in Applied Statistics (Honors) 08/2010 - 05/2012

Autonomous University of Nuevo Leon, Mexico
B.S. in Mathematics 08/2005 - 05/2010

RESEARCH AREAS

- Statistics: Experimental design, model selection and longitudinal data analysis.
- Operations Research: Heuristic algorithms and mixed integer programming.

PUBLICATIONS

1. Vazquez, A. R., Schoen, E. D., and Goos, P. (2022). Two-level orthogonal screening designs with 80, 96 and 112 runs, and up to 29 factors. *Journal of Quality Technology*, 54:338-358.
2. Staes, I., Bäcker, L. E., Simoens, K., De Winter, K., Marolt, G., Cenens, W., Wolput, S., Vazquez, A. R., Goos, P, Lavigne, R., Bernaerts, K., and Aertsen, A.

(2022). Superinfection exclusion factors allow for a history-dependent switch from vertical to horizontal phage transmission. *Cell Reports*, 39:110804.

3. Vazquez, A. R., Schoen, E. D., and Goos, P. (2021). A mixed integer optimization approach for model selection in screening experiments. *Journal of Quality Technology*, 53:243-266.
4. Kort R., Schlösser, J., Vazquez, A. R., Atakunda, P., Muhoozi, G. K. M., Wacoo, A. P., Sybesma, W. G. H., Westerberg, A. C., Iversen, P. O., and Schoen E. D. (2021). Model selection reveals the butyrate-producing gut bacterium Coprococcus eutactus as predictor for language development in three-year-old rural Ugandan children. *Frontiers in Microbiology, section Systems Microbiology*, 12:1-14.
5. Vazquez, A. R., Goos, P., and Schoen, E. D. (2019). Projections of definitive screening designs by dropping columns: Selection and evaluation. *Technometrics*, 62:37-47.
6. Vazquez, A. R., and Xu, H. (2019). Construction of two-level nonregular designs of strength three with large run sizes. *Technometrics*, 61:341-353.
7. Vazquez, A. R., Goos, P., and Schoen, E. D. (2019). Constructing two-level designs by concatenation of strength-3 orthogonal arrays. *Technometrics*, 61:219-232.
8. Goos, P., Syafitri, U., Sartono, B., and Vazquez, A. R. (2019). A nonlinear multidimensional knapsack problem in the optimal design of mixture experiments. *European Journal of Operational Research*. 128:201-221.
9. Trigos, F., Vazquez, A. R., and Cárdenas-Barrón, L. E. (2019). A simulation-based heuristic that promotes business profit while increasing the perceived quality of service industries. *International Journal of Production Economics*, 211:60-70.
10. Eendebak, P. T. and Vazquez, A. R. (2019). OApackage: A Python package for generation and analysis of orthogonal arrays, optimal designs and conference designs. *Journal of Open Source Software*, 4:1097.
11. Maestroni, B. M., Vazquez, A. R., Avossa, V., Goos, P., Cesio, V., Heinzen, H., Riener, J., Cannavan, A. (2018). Ruggedness testing of an analytical method for pesticide residues in potato. *Accreditation and Quality Assurance*, 23:303-316.
12. Vázquez-Alcocer, A., Garzón, D. L., and Sánchez-Casas, R. M. (2014). LADES: A software for constructing and analyzing longitudinal designs in biomedical research. *PLoS ONE* 9(7): e100570.

MANUSCRIPTS

Vazquez, A. R., and Xu, H. (2021). An integer programming approach for constructing maximin distance designs from good lattice point sets and the Williams' transformation. In review.

Vazquez, A. R., Wong, W.-K., and Goos, P. (2022). Constructing two-level Q_B-optimal designs for screening experiments using mixed integer programming and heuristic algorithms. In review.

Eendebak P. T., Schoen, E. D., Vazquez, A. R., and Goos, P. (2022). Systematic enumeration of two-level even-odd designs. In review.

Schoen, E. D., Eendebak P. T., Vazquez, A. R., and Goos, P. (2021). Systematic enumeration of definitive screening designs. In review.

TEACHING EXPERIENCE

College of Engineering, University of Arkansas, U.S.A.

- INEG514V - Introduction to Industrial Statistics 08/2022 - present

College of Physical Sciences, University of California, Los Angeles, U.S.A.

- STATS101B - Introduction to Design and Analysis of Experiments 03/2022 - 06/2022
- STATS101A - Introduction to Data Analysis and Regression 01/2022 - 03/2022
- STATS101B - Introduction to Design and Analysis of Experiments 03/2021 - 06/2021
- STATS101C - Introduction to Statistical Models and Data Mining 10/2020 - 12/2020

Faculty of Bioscience Engineering, University of Leuven, Belgium

- I0R00A - Experimental Planning and Data Modelling 09/2019 - 01/2020
- I0R00A - Mathematical Planning and Advanced Statistics 09/2018 - 01/2019

THESIS DIRECTED

Faculty of Bioscience Engineering, University of Leuven, Belgium 10/2019 - 09/2020
Adityavarna Dehaleesan
M.S. in Statistics
Thesis: Construction of Large Orthogonal Designs by Concatenating Smaller Designs With Different Numbers of Runs.
Co-advisor: Prof. Peter Goos.

Faculty of Bioscience Engineering, University of Leuven, Belgium 09/2018 - 06/2020
Cristina Tapia
M.S. in Statistics
Thesis: I-optimal Designs with Blocks of Size Two.
Co-advisor: Prof. Peter Goos.

Faculty of Business and Economics, University of Antwerp, Belgium 10/2016 - 07/2017
Hajar Hamidouche
M.S. in Business Engineering
Thesis: Conference-Design-Based Definitive Screening Designs.
Co-advisor: Prof. Peter Goos.

MENTORING

Department of Statistics, University of California, Los Angeles U.S.A. 03/2022 - 06/2022
Xiaocong Xuan
STATS 199 - Directed Research in Statistics
Project: Exploring the pedagogy of Design of Experiments in the era of Data Science.

Department of Statistics, University of California, Los Angeles U.S.A. 03/2022 - 06/2022
Isaac Huang
STATS 199 - Directed Research in Statistics
Project: Parameter tuning of optimization solvers using designed experiments.

Department of Statistics, University of California, Los Angeles U.S.A. 09/2021 - 12/2021

Angeline (Siew Fen) Eow
STATS 199 - Directed Research in Statistics
Project: A critical evaluation of subsampling methods for big data.

AWARDS AND GRANTS

- Flemish Fund for Scientific Research (FWO) Grant for a Short Research Stay Abroad. 01/2020
- FWO Junior Postdoctoral Fellowship. 06/2019
- Travel Grant for the International Conference on Design of Experiments 2019. 05/2019
- European Network for Business and Industrial Statistics (ENBIS) Knowledge Fund for Participation in the ENBIS-2019 Conference. 04/2019
- FWO Grant for Participation in a Conference Abroad. 10/2018
- Travel Grant for the Design and Analysis of Experiments Conference 2017. 10/2017
- FWO Grant for a Long Research Stay Abroad. 12/2016
- Monterrey Institute of Technology Ph.D. Degree Scholarship. 05/2012
- Mexico's National Science and Technology Council (CONACyT) Master Degree Scholarship. 08/2010

CONFERENCE PRESENTATIONS AND SEMINARS (†: INVITED)

†An integer programming approach for constructing maximin distance designs from good lattice point sets and the Williams' transformation. *Quality and Productivity Research Conference 2022*. San Francisco, U.S.A. June, 2022.

†Effective algorithms for constructing two-level Q_B-optimal designs for screening experiments. *5th International Conference on Econometrics and Statistics (EcoSta 2022)*. Kyoto, Japan. June, 2022.

†21st Century Design of Screening Experiments: The construction of model-robust designs using exact and heuristic algorithms. *Seminar at the Department of Industrial Engineering at the University of Arkansas*. Fayetteville, Arkansas, U.S.A. February, 2022.

†Effective algorithms for constructing two-level Q_B-optimal designs for screening experiments. *Webinar at the Department of Mathematics at King's College London*. London, U.K. November, 2021.

†Two-level orthogonal designs for intensive screening experiments: Construction and evaluation (in Spanish). Conference in Honor of Guadalupe Evaristo Cedillo-Garza, Autonomous University of Nuevo Leon. San Nicolas de los Garza, Mexico. August, 2021. A recording of my presentation is available at the following link: `https://www.facebook.com/fime.oficial/videos/272984141000518`.

†Two-level orthogonal screening designs with 80, 96 and 112 runs: Construction and evaluation. *Quality and Productivity Research Conference 2021*. Tallahassee, U.S.A. July, 2021.

†Constructing optimal screening designs for effective experimentation using metaheuristics. *Metaheuristic Optimization, Machine Learning and AI – Virtual Workshop*. Hosted by The Statistical and Applied Mathematical Sciences Institute (SAMSI). March, 2021. A recording of my presentation is available at the following link: `https://vimeo.com/522352717`.

†A mixed integer optimization approach for model selection in screening experiments. *Invited seminar at GlaxoSmithKline (GSK).* Rixensart, Belgium. October, 2019.

A mixed integer optimization approach for model selection in screening experiments. *Meeting of the European Network for Business and Industrial Statistics 2019 (ENBIS 2019).* Budapest, Hungary. September, 2019.

†A mixed integer optimization approach for model selection in screening experiments. *European Conference on Operational Research (EURO-2019).* Dublin, Ireland. June, 2019.

†Construction of large two-level nonregular designs of strength three. *International Conference on Design of Experiments 2019 (ICODOE 2019).* Memphis, U.S.A. May, 2019.

†A mixed integer optimization approach for model selection in screening experiments. *Conference on Experimental Design and Analysis 2018 (CEDA 2018).* Hsinchu, Taiwan. December, 2018.

Two-Level Designs Constructed by Concatenating Orthogonal Arrays of Strength Three. Poster presented at *The Design and Analysis of Experiments Conference 2017 (DAE 2017).* Los Angeles, U.S.A. October, 2017.

†Extending the Definitive Screening Designs (in Spanish). Faculty of Physical and Mathematical Sciences Seminar, Autonomous University of Nuevo Leon. San Nicolas de los Garza, Mexico. June, 2017.

Dropping Columns from Definitive Screening Designs. *Doctoral Day 2016.* Antwerp, Belgium. November, 2016.

†Extending Definitive Screening Designs by Concatenation. *International Symposium on Business and Industrial Statistics 2016 (ISBIS-2016).* Barcelona, Spain. June, 2016.

Fractional Factorial Designs by Combining Two-Level Designs. *Meeting of the European Network for Business and Industrial Statistics 2015 (ENBIS 2015).* Prague, Czech Republic. September, 2015.

Fractional Factorial Designs by Combining Two-Level Designs. *Belgian Statistical Society Meeting 2015 (BSS 2015).* Antwerp, Belgium. October, 2015.

The Construction of Large Two-Level Designs from Two Orthogonal Arrays of Strength Two. Poster presented at the *Leuven Statistics Day 2014.* Leuven, Belgium. December, 2014.

MEMBERSHIP

Member of the Editorial Board of *Quality Engineering*

REFEREE SERVICE

Australian & New Zealand Journal of Statistics (1); Computers and Industrial Engineering (1); Journal of Computational Statistics and Data Analysis (1); Journal of Statistical Planning and Inference (1); Journal of Statistical Theory and Practice (1); Metrika (2); Quality Engineering (1); STATISTICA (1); Statistics and Probability Letters (1); Statistica Sinica (1); Technometrics (1).