

Adolfo R. Escobedo
Curriculum Vitae

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Assistant Professor, Industrial Engineering Faculty
School of Computing, Informatics, and Decision Systems Engineering
Arizona State University

Research Interests

Theory and application of mathematical programming; design, analysis, and high-performance implementation of discrete optimization algorithms; computational linear algebra.

Applications: Computational social choice, power systems operation & planning, circular economy, optimization solver development.

Education

Ph.D. **Texas A&M University (TAMU)** 2010 – 2016
Industrial and Systems Engineering

*Foundational Factorization Algorithms for the Efficient Roundoff
Error-Free Solution of Optimization Problems*

Erick Moreno-Centeno (chair), Sergiy Butenko, Wilbert Wilhelm, Catherine Yan

B.A. **California State University, Los Angeles (CSULA)** 2004 – 2009
Mathematics (with a minor in History)
Additional Areas of Concentration: Computer Science

Appointments and Employment

ASU **Senior Sustainability Scientist** Dec 2017 - present
Julie Ann Wrigley Global Institute of Sustainability

ASU **Assistant Professor** Aug 2016 – present
School of Computing, Informatics, and Decision Systems Engineering

TAMU **Graduate Research Assistant** June 2012 – Aug 2016
Industrial & Systems Engineering Department

TAMU **Instructor of Record** Spring 2016, Spring 2015
Industrial & Systems Engineering Department

LLNL **Graduate Student Intern** May 2015 - Sep 2015
Computational Engineering Division

Publications (Supervised graduate students at ASU identified with ‘*’)

Appeared/to-Appear in Refereed Journals:

1. A. R. Escobedo, E. Moreno-Centeno, “Solution of dense linear systems via roundoff-error-free factorization algorithms: theoretical connections and computational comparisons”, *ACM Transactions on Mathematical Software*, 44(4) 2018, 40–63.
2. A. R. Escobedo, E. Moreno-Centeno, “Roundoff-error-free Basis Updates of LU Factorizations for the Efficient Validation of Optimality Certificates”, *SIAM Journal on Matrix Analysis and Applications*, 38(3) 2017, 807–828.
3. E. Moreno-Centeno, A. R. Escobedo “Axiomatic aggregation of incomplete rankings”, *IIE Transactions*, 48(6) 2016, 475–488.
4. A. R. Escobedo, E. Moreno-Centeno, “Roundoff-error-free algorithms for solving linear systems via Cholesky and LU factorizations”, *INFORMS Journal on Computing*, 27(4) 2015, 677–689. (INFORMS Junior Faculty Paper Competition Honorable Mention, top-6 finalist)
5. A. R. Escobedo, E. Moreno-Centeno, K. W. Hedman, “Topology control for load-shed recovery”, *IEEE Transactions on Power Systems*, 29(2) 2014, 908–916.

Appeared/to-Appear in Refereed Conference Proceedings:

1. L. M. Escobar, A. R. Escobedo, David Escobar, R. A. Romero Lázaro, “Bus-angle difference structural cuts for transmission system expansion planning with L-1 reliability”, *Procs. of IEEE Electrical Power and Energy Conference*, 2018.

Submitted/under-Review in Refereed Journals:

1. Y. Yoo*, A. R. Escobedo, “A new binary programming formulation and social choice property for expediting the solution to Kemeny ranking aggregation”, 2018.
2. L. M. Escobar, J. K. Skolfield*, A. R. Escobedo, “Derivation and generation of angular valid inequalities for transmission expansion planning.”, 2018.
3. C. Lourenco, A. R. Escobedo, E. Moreno-Centeno, T. A. Davis “Asymptotically optimal exact solution of sparse linear systems via left-looking roundoff-error-free LU factorization”, 2018.
4. A. R. Escobedo, D. S. Hochbaum, E. Moreno-Centeno, “Axiomatic joint aggregation of cardinal and ordinal evaluations,” 2018.
5. A. R. Escobedo, Y. Yoo*, J. K. Skolfield*, “A new correlation coefficient for comparing and aggregating non-strict and incomplete rankings,” 2017. <https://arxiv.org/abs/1801.07793>.

Research Presentations

- L. M. Escobar, A. R. Escobedo, D. Escobar, R. Lázaro, “Bus-angle difference structural cuts for transmission system expansion planning with L-1 reliability” ,IEEE Electrical Power and Energy Conference, Toronto Canada, Oct 2018.
- A. R. Escobedo, L. M. Escobar, J. K. Skolfield*, R. Lázaro, “Generation of angular valid inequalities for Transmission Expansion Planning”, International Symposium on Mathematical Programming, Bordeaux, France, July 2018.

- Y. Yoo*, A. R. Escobedo, “A computationally expedient social choice-related property for group decision-making”, International Symposium on Aggregation and Structures, Valladolid Spain, July 2018.
- A. Dean, A. R. Escobedo, W. Campbell, “A decision support tool for circular economy development”, International Symposium on Sustainable Systems and Technology, Buffalo, NY, June 2018.
- Y. Yoo*, A. R. Escobedo, “An improved ranking aggregation algorithm using a new extended Condorcet criterion”, IISE Annual Conference & Expo, Orlando FL, May 2018.
- Y. Yoo*, A. R. Escobedo, “An Improved Branch and Bound Algorithm for Robust Ranking Aggregation”, INFORMS Optimization Society Conference, Denver CO, Mar 2018.
- A. R. Escobedo, “Unification of distance and correlation ranking aggregation theories”, (invited seminar) Oakland University Mathematics and Statistics Department, Rochester MI, Feb 2018.
- A. R. Escobedo, Y. Yoo*, J. K. Skolfield*, “A new correlation coefficient for aggregating non-strict and incomplete rankings equitably”, INFORMS Annual Meeting, Houston TX, Oct 2017.
- A. R. Escobedo, “Roundoff-Error-Free Algorithms for Optimization” (invited seminar) CSUSD Mathematics Department, San Diego CA, Oct 2017.
- A. R. Escobedo, J. K. Skolfield*, “A new correlation coefficient for aggregating incomplete rankings equitably”, 21st IFORS Conference, Quebec City, July 2017.
- A. R. Escobedo, J. K. Skolfield*, “A rank-correlation coefficient for aggregating non-strict and incomplete preferences equitably”, IISE Annual Conference & Expo, Pittsburgh PA, May 2017.
- A. R. Escobedo, E. Moreno-Centeno, “Efficient Validation of Basic Solutions via the Roundoff-Error-Free Factorization Framework,” INFORMS Annual Meeting, Nashville TN, Nov 2016.
- A. R. Escobedo, E. Moreno-Centeno, “Efficient Validation of Basic Solutions via the Roundoff-Error-Free Factorization Framework,” 5th International Congress on Mathematical Software, Berlin, July 2016.
- A. R. Escobedo, E. Moreno-Centeno, “Update algorithms for the roundoff-error-free LU and Cholesky factorizations,” INFORMS Optimization Society Conference, Princeton NJ, March 2016.
- A. R. Escobedo, E. Moreno-Centeno, “Update algorithms for the roundoff-error-free LU and Cholesky factorizations,” INFORMS Annual Meeting, Philadelphia PA, Nov 2015.
- A. R. Escobedo, M. L. Stowell, D. A. White, “Topological optimization of photonic crystals,” (poster) LLNL Summer Symposium, Livermore CA, Aug 2015.
- A. R. Escobedo, E. Moreno-Centeno, “Efficient update algorithms for the roundoff-error-free LU and Cholesky factorizations,” International Symposium on Mathematical Programming, Pittsburgh PA, July 2015.
- A. R. Escobedo, E. Moreno-Centeno, “Roundoff-error-free algorithms for solving linear systems via Cholesky and LU factorizations,” INFORMS Computing Society Conference, Richmond VA, Jan 2015.
- A. R. Escobedo, E. Moreno-Centeno, “An overview of integer-preserving Gaussian elimination and the roundoff-error-free LU and Cholesky factorizations,” (invited seminar) TAMU Mathematics Department, College Station TX, Dec 2014.
- A. R. Escobedo, “Roundoff-error-free algorithms for optimization,” (invited seminar) CSULA Mathematics Department, Los Angeles CA, Nov 2014.

- A. R. Escobedo, “Computational tools for recovering load shed via topology control,” (invited seminar) TAMU Electric Power and Power Electronics Institute, College Station TX, Oct 2014.
- A. R. Escobedo, E. Moreno-Centeno, K. W. Hedman, “Balanced parallelization policies for the distributed load-shed recovery heuristic,” (poster) XSEDE Conference, Atlanta GA, July 2014.
- A. R. Escobedo, E. Moreno-Centeno, K. W. Hedman, “Transmission switching load shed recovery heuristic and its parallelization,” (poster) SC13 Broader Engagement Student Session, Denver CO, Nov 2013.
- A. R. Escobedo, E. Moreno-Centeno, K. W. Hedman, “Topology control for load shed recovery,” INFORMS Annual Meeting, Minneapolis MN, Oct 2013.
- A. R. Escobedo, “Load shed recovery: a new application of transmission switching,” (poster) Smart Grid Workshop, College Station TX, April 2013.
- A. R. Escobedo, “Robust adaptive topology control,” (poster) Texas A&M University System LSAMP Symposium, Corpus Christi TX, Feb 2012.

Courses Taught

As Assistant Professor

SCIDSE, Arizona State University:

- IEE 574 Applied Deterministic Operations Research (Fall 2016, 2017, 2018)
- IEE 622 Optimization II: Integer Programming (Spring 2017, 2018)

As Instructor of Record

ISEN, Texas A&M University:

- ISEN 302 Engineering Economic Analysis, TAMU (Spring 2015, Spring 2016)

Other Teaching Development

- College of Engineering Graduate Teaching Fellowship Program, TAMU 2016
- Course certificate, “Future Academician Development” (ENG 681), TAMU 2013
- Substitute instructor, “Optimization Algorithms” (ISEN 489), TAMU 2012
- Fellows certificate, Graduate Teaching Academy (ENG 689), TAMU 2012

Professional Organization Memberships

- Institute for Operations Research and the Management Sciences (INFORMS)
- Institute of Industrial and Systems Engineers (IISE)
- Institute of Electrical and Electronic Engineers (IEEE)
- Association for Computer Machinery (ACM)
- INFORMS Computing Society (ICS)
- INFORMS Optimization Society (IOS)
- Mathematical Optimization Society (MOS)

Service

- Associated editor for:
Energy Systems
- Referee for:
IEEE Transactions on Power Systems,
International Journal of Electrical Power & Energy Systems,
IIEE Transactions,
Journal of Global Optimization,
Networks,
Optimization Letters
- Review panelist for NSF Operations Engineering program 2017
- Track chair of Operations Research for IIEE Annual Conference & Expo 2017
- Session chair for INFORMS Annual Meeting 2016, 2017
- Session chair for INFORMS Optimization Society Conference March 2016
- Appointed Ambassador for TAMU-System AGEP program Dec 2015 - June 2016
- Mentor for LSAMP Bridge to the Doctorate Program, TAMU Aug 2015 - May 2016
- Appointed member of 2016 Convocation Speaker Committee, TAMU March 2015
- Departmental representative in College Student Council, TAMU Jan 2015 - May 2016
- Poster session judge for USRG/REU programs, TAMU Aug 2014
- LSAMP Graduate School Experience Panel, TAMU Oct 2013
- Graduate student mentor for INFORMS Student Chapter, TAMU Sep 2013 - May 2016
- Poster session judge for LSAMP Annual Symposium Feb 2013

Awards and Honors

Fellowships:

- U.S. Senator Phil Gramm Doctoral Fellowship, TAMU, 2016
- Jimmy H. Smith, Ph.D., P.E. Graduate Scholarship, TAMU, 2015
- TAMU Energy Institute/Conoco Phillips Fellowship, TAMU, 2013 & 2014
- Graduate Diversity Fellowship, TAMU, 2012 – 2015
- LSAMP Bridge to the Doctorate Fellowship, TAMU, 2010 – 2012
- President’s Scholarship, CSULA, 2004 – 2008

Other:

- Finalist, INFORMS Junior Faculty Forum Paper Competition, 2015
- Selectee of INFORMS Doctoral Student Colloquium, 2015
- Selectee of University of Michigan’s Engineering NextProf Workshop, 2014
- Extreme Science and Engineering Discovery Scholar, 2012 & 2014
- First place in TAMU INFORMS PhD Student Chapter presentation competition, 2013

- Member of Phi Kappa Phi Honor Society, CSULA,

2009

Updated: October 2018