



UTSA Engineering

KRYSTEL CASTILLO

GreenStar Endowed Assistant Professor
Mechanical Engineering

PUBLICATIONS AT UTSA:

- 1 book
- 4 book chapters
- 16 peer-reviewed journal articles
- 19 refereed conference papers

GRANT FUNDING AT UTSA:

Dr. Castillo has received more than \$2 million in grant funding from agencies including:

- U.S. Department of Agriculture
- National Science Foundation
- General Dynamics Information Technology
- Harland Clarke
- CPS-TeSERI
- Toyota Manufacturing Texas
- CONACyT
- San Antonio Life Sciences Institute
- UTSA VPR

KEY RESEARCH AREAS:

- Renewable Energy (Bioenergy)
- Big Data Analytics
- Optimization
- Mathematical Modeling
- Systems Engineering

Krystel Castillo came to the College of Engineering in 2012 as an assistant professor in the Department of Mechanical Engineering and has excelled in both her mentorship of students and research since her arrival at The University of Texas at San Antonio.

Dr. Castillo's research expertise is in two primary areas. The first is mathematical programming and optimization techniques for analyzing large-scale, complex systems under uncertainty. The second is in big data analytics, which has applications to renewable energy, aerospace/military industry, supply chain network design, and healthcare operations.

In addition to her role as an assistant professor, Dr.

Castillo is co-director of the Manufacturing Systems and Automation (MSA) Laboratory, a state-of-the-art facility for teaching, research, and development in advanced manufacturing and big data analytics. The MSA Laboratory provides an excellent foundation with integrated hands-on applications for undergraduate and graduate-level courses and theses in the area of advanced manufacturing, incorporating effective and efficient integration and synthesis of automation technologies, big data analytics, and decision-making models for design planning, scheduling, and control of manufacturing processes and delivery of services.



UTSA Engineering

The University of Texas at San Antonio College of Engineering is leading the way in energy research.

The college has partnerships with leaders in the energy industry including CPS Energy, Duke Energy, Nexolon, and The State Energy Conservation Office.

NOTABLE PUBLICATIONS/PRESENTATIONS:

- **Castillo-Villar, K. K.**, & Herbert-Acero J. F. (2014). *A metaheuristic-based approach for the capacitated supply chain network design problem including imperfect quality and rework*. Computational Intelligence Magazine, IEEE, 9(4), 31-45.
- Herbert-Acero, J. F., Probst O., Réthoré P-E., Larsen, G. C., & **Castillo-Villar K. K.** (2014). *A review of methodological approaches for the design and optimization of wind farms*. Energies, 11, 6930-7016.
- **Castillo-Villar, K. K.**, Smith, N. R., & Simonton, J. L. (2012). *The impact of the cost of quality on serial supply chain network design*. International Journal of Production Research, 50(19), 5544-5566.
- Yu, T.E., Larson, J. A., English, B. C., Boyer, C. N., Tyler, D. D., & **Castillo-Villar, K. K.** (2015). *Influence of particle size and packaging on storage dry matter losses for switchgrass*. Biomass & Bioenergy, 73, 135-144
- **Castillo-Villar, K. K.**, Smith, N. R., & Simonton, J. L. (2012). *A model for supply chain design considering the cost of quality*. Applied Mathematical Modelling, 36(12), 5920-5935.

STUDENT MENTORING:

Dr. Castillo currently advises 6 students including 4 Ph.D. students, 1 master's student and 1 undergraduate student in her Manufacturing Systems and Automation Laboratory.

RESEARCH FUNDING:

Project Title: Opportunities for Higher Education and Research Experience in Renewable Energy and Water Quality to Enable STEM Hispanic Leaders

Sponsor: U.S. Department of Agriculture

Total Amount Awarded: \$290,000

Term of Award: 4 years

- **Project Title:** Development of a Low-Cost Robust Circulating Fluidized Technology for Integration into a Novel Mathematical Model to Promote the Sustainable Production of Biofuels and Biobased Products

Sponsor: CONNECT (UTSA-SwRI)

Total Amount Awarded: \$125,000

Term of Award: 12 months

- **Project Title:** Probabilistic Modeling of Turbine Engine Sustainment

Sponsor: General Dynamics Information Technology

Total Amount Awarded: \$152,444

Term of Award: 2 years

- **Project Title:** Alternative Transportation Initiatives

Sponsor: CPS Energy - TeSERI

Total Amount Awarded: ~\$255,000

Term of Award: 1 year

NOTABLE ACCOMPLISHMENTS:

- 2014 and 2015 - Summer Faculty Fellowship, Air Force Research Laboratory, WPAFB, Dayton, Ohio.
- 2015 Faculty Award for Excellence in Research 2014, College of Engineering, The University of Texas at San Antonio.
- 2013 - Member of the National System of Researchers. National Council of Science and Technology (CONACyT).