

# David Milan

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## Education

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| 2008 | Ph.D. | <b>University of Nebraska-Lincoln</b> , Mathematics<br>Dissertation: $C^*$ -algebras of Inverse Semigroups<br>Advisors: John Meakin and David Pitts |
| 2001 | B.S.  | <b>University of Nebraska-Lincoln</b><br>Mathematics and Computer Science   |

## Professional Experience

- **Professor and Acting Chair**, The University of Texas at Tyler, 2023–present.
- **Professor**, The University of Texas at Tyler, 2020–2023.
- **Associate Professor**, The University of Texas at Tyler, 2014–2020.
- **Assistant Professor**, The University of Texas at Tyler, 2008–2014.
- **Teaching Assistant**, University of Nebraska, 2001–2008

## Publications – (\*) indicates undergraduate coauthor

- Labelled graphs as a Morita equivalence invariant of inverse semigroups (with Zachary Duah\*, Stian du Preez\*, Shreyas Ramamurthy\*, and Lucas Vega\*), *Semigroup Forum* (2025).
- A note on Morita equivalence to graph inverse semigroups (with Martha du Preez\*, Robert Grimley\*, Evan Lira\*, and Shreyas Ramamurthy\*), submitted to *Semigroup Forum* in July 2023.
- On the inverse hull of a Markov shift (with Aria Beaupré\*, Anthony Dickson\*, and Christin Sum\*), *International Journal of Algebra and Computation* **32** (2022), no. 5, 969-984.
- On a class of inverse semigroups related to Leavitt path algebras (with John Meakin and Zhengpan Wang), *Advances in Mathematics* **384** (2021).
- Zigzag maps and the path category of an inverse semigroup (with Allan Donsig, Jennifer Gensler\*, Hannah King\*, and Ronen Wdowinski\*), *Semigroup Forum* (2019).
- Classes of uniformly most reliable graphs for all-terminal reliability (with Kassie Archer and Christina Graves), *Discrete Applied Mathematics* **267** (2019) 12-29.
- Condition (K) for inverse semigroups and the ideal structure of their  $C^*$ -algebras (with Scott LaLonde and Jamie Scott\*), *Journal of Algebra*, **523** (2019), 119-153.
- Amenability and uniqueness for groupoids associated with inverse semigroups (with Scott LaLonde), *Semigroup Forum*, **95** (2017), no. 2, 321-344.
- Joins and cover in inverse semigroups and tight  $C^*$ -algebras (with Allan Donsig), *Bulletin of the Australian Mathematical Society*, **90** (2014), no. 1, 121-133.
- Reliability polynomials having arbitrarily many inflection points (with Christina Graves), *Networks*, **64** (2014), no. 1, 1-5.
- On inverse semigroup  $C^*$ -algebras and crossed products (with Benjamin Steinberg), *Groups, Geometry, and Dynamics*, **8** (2014), no. 2, 485-512.
- The stick number for the simple hexagonal lattice (with C. Mann and J McLoud-Mann), *Journal of Knot Theory and Its Ramifications*, **21** (2012), no. 14, 15pp.

- $C^*$ -algebras of inverse semigroups: amenability and weak containment, *Journal of Operator Theory*, **63** (2010), no. 2, 317-332.

### Student Publications

- On the long-repetition-free 2-colorability of trees (J. Antonides\*, C. Kiers\*, N. Yamzon\*), *Rose Hulman Undergraduate Mathematics Journal*, **18** (2017), no. 1, 262-269.

### Grants

- (Co-PI) **REU Site: Algebra, Analysis, and Combinatorics at UT Tyler** 2025-2027  
Proposal for \$377,568 with PI Maddie Dawsey submitted.
- (PI) **2024 College Readiness and Success Models** 2024-2025  
Funded for \$ 118,430 by the Texas Higher Education Coordinating Board (with Miriam Rowntree).
- (PI) **REU Site: Algebra, Graphs, and Number Theory at UT Tyler** 2022-2024  
Funded for \$311,154 by the NSF (with Co-PI Christy Graves).
- (Co-PI) **Brazos Analysis Seminar** 2020-2022  
Conference series funded for \$49,999 by the NSF (with multiple Co-PIs).
- (PI) **Texas Undergraduate Mathematics Conference Grant** 2018-2019  
Conference series funded for \$14,553 by the NSF.
- (PI) **Renewal of REU Site at UT Tyler** 2017-2019  
Funded for \$254,443 by the NSF (with Co-PI Christy Graves).
- (PI) **Renewal of REU Site at UT Tyler** 2014-2016  
Funded for \$258,739 by the NSF (with Co-PI Christy Graves).
- (Senior Personnel) **REU Site at UT Tyler** 2011-2013  
Funded for \$213,795 by the NSF.
- (PI) **UT Tyler Faculty Research Grant** 2009  
Internal grant funded for \$7,184.

### Awards and Honors

- **White Fellowship for Teaching Excellence** 2016  
Awarded by UT Tyler to recognize outstanding teachers (\$2500).
- **Research Award** 2014  
Awarded by UT Tyler to recognize research accomplishments.
- **IMMERSE Early Career Faculty Fellow** 2011  
Designed and taught 6-week graduate algebra course focused on understanding a research paper for incoming graduate students. The project was supported by an NSF grant.
- **Project Next Fellow** 2008-2009  
Project NExT (New Experiences in Teaching) is a professional development program for recent math PhDs supported by the Mathematical Association of America.
- **Fields Institute Invited Researcher** 2007

### Research Talks

- *Morita equivalence of combinatorial inverse semigroups* 2024  
Short talk for the Conference on Theoretical and Computational Algebra in Aveiro, Portugal.
- *Morita equivalence of inverse semigroups associated to cancellative categories* 2022  
Invited talk for the AMS Special Session on Algebraic Structures in Topology, Logic, and Arithmetic in El Paso, TX.

- *On inverse hulls of Markov subshifts* 2020  
Invited talk for the AMS Special Session on Recent Trends in Semigroup Theory in Denver, CO
- *$C^*$ -algebras associated with inverse semigroups and étale groupoids* 2019  
Invited talk at Brazos Analysis Seminar in Waco, TX.
- *On non-Hausdorff étale groupoids* 2019  
Invited talk at International Workshop on Operator Theory and its Applications in Lisbon, Portugal.
- *Condition (K) for inverse semigroups and the ideal structure of their  $C^*$ -algebras* 2018  
Contributed talk at the Great Plains Operator Theory Symposium in Oxford, OH.
- *Partial Symmetries, inverse semigroups, and inverse semigroup algebras* 2017  
Invited talk at 2017 Research Symposium for University of Washington Bothell and Seattle University REU groups in Bothell, WA.
- *Amenability and uniqueness for groupoids associated with inverse semigroups* 2016  
Invited talk at Spring Central Sectional Meeting in Fargo, ND.
- *Amenability and uniqueness for groupoids associated with inverse semigroups* 2016  
Contributed talk at the Joint Mathematics Meetings in Seattle, WA.
- *Finitely aligned semigroupoids and tight  $C^*$ -algebras* 2014  
Contributed talk at the Joint Mathematics Meetings in Baltimore, MD.
- *Tight representations of inverse semigroups* 2012  
Contributed talk at the Great Plains Operator Theory Symposium in Houston, Texas.
- *Crossed product results for inverse semigroup algebras* 2012  
Invited talk at INFAS in Des Moines.
- *A tour of  $C^*$ -algebras generated by partial isometries* 2010  
Invited talk at SFA department colloquium in Nacogdoches, TX.
- *On the  $C^*$ -algebras of  $E$ -unitary inverse semigroups* 2008  
Invited talk at the West Coast Operator Algebra seminar in Flagstaff, AZ.

### Mentoring

#### Research Experience for Undergraduates

- M. Chabaud, S. du Preez, N. Goluboff 2024  
*Characterizing the inverse semigroups of labelled graph spaces*
- Z. Duah, S. du Preez, S. Ramamurthy, L. Vega 2023  
*Labelled graphs as a Morita equivalence invariant of inverse semigroups*
- M. du Preez, R. Grimley, E. Lira, S. Ramamurthy 2022  
*Morita equivalence to graph inverse semigroups*
- A. Beaupre, A. Dickson, and C. Sum 2019  
*Inverse semigroups associated with Markov shifts*
- J. Gensler, H. King, and R. Wdowinski 2018  
*Zigzag maps and the path category of an inverse semigroup*
- T. Arrigoni, A. Black, J. Harter and Y. Perez 2017  
*Inverse semigroups associated with self-similar graph actions*
- C. Bang, J. Scott, and V. Villalobos 2016  
*Uniqueness theorems for inverse semigroups*
- D. Blackwell, C. Hunt, and K. Johnson 2015  
*Reliability polynomials of simple graphs having arbitrarily many inflection points*
- P. Egging, R. Laudone, and A. Owens 2014  
*Coloring Techniques for Pattern Avoidance over an Infinite Sequence*

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- J. Antonides, C. Spychalla, and N. Yamzon 2013  
*On the long-repetition-free 2-colorability of trees*
  - A. Berger, C. Simmons, J. Troyka, and L. White, 2012  
*Long-square-free words and graph colorings*

### Service to Students

- Numerous math club talks 2008-2024
- Judge for Lyceum Student Research Showcase 2017-2023
- Putnam Exam advisor 2013-2019
- Organized student conference trips
  - TUMC in Nacogdoches, TX 2018
  - NCUWM in Lincoln, NE 2018
  - JMM in San Diego, CA 2018
  - TUMC in San Antonio, TX 2017
  - TUMC in Beaumont, TX 2016
  - Texas MAA in Abilene, TX 2010
  - TUMC in Huntsville, TX 2009
  - Texas MAA in Denton, TX 2009
- Academic advisor 2008-present
  - I have advised over 25 students.

### Service to Profession

- Invited grant reviewer for the NSF 2019
- Invited Journal Referee
  - Journal of Algebra*
  - Journal of the Australian Mathematical Society*
  - Journal of Operator Theory*
  - Semigroup Forum*
- Judge for Undergraduate Research Poster Session at the Joint Mathematics Meetings 2011-2024
- Conference organizer
  - Executive committee for the TUMC 2013-2020
  - Co-PI for Brazos Analysis seminar 2020-2024
  - Volunteer organizer for Texas Section of the MAA 2011