

## SELVI KARA | CV

## »»» Employment

|                           |                                            |                                                                 |
|---------------------------|--------------------------------------------|-----------------------------------------------------------------|
| August 2022 - present     | <b>Bryn Mawr College</b>                   | <b>Department of Mathematics</b><br>Assistant Professor         |
| August 2022 - August 2023 | <b>University of Utah</b>                  | <b>Science Research Initiative</b><br>Postdoctoral Fellow       |
| July 2021 - July 2022     | <b>University of Utah</b>                  | <b>Department of Mathematics</b><br>Research Associate          |
| August 2017 - May 2021    | <b>University of South Alabama</b>         | <b>Department of Math and Stats</b><br>(TT) Assistant Professor |
| Summer 2017               | <b>Girls Who Code at Packer Collegiate</b> | Instructor                                                      |

## »»» Research Interests

Commutative algebra, algebraic and geometric combinatorics, computational algebra

## »»» Fellowships

|                    |                                            |                                     |
|--------------------|--------------------------------------------|-------------------------------------|
| <b>2021 - 2022</b> | <b>Mathematical Association of America</b> | <b>Gold '21 Project NExT Fellow</b> |
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## »»» Education

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| <b>May 2017</b>                                                                                                                                      | <b>Tulane University - Ph.D. in Mathematics</b>                         |
| » <b>Thesis:</b> <i>Castelnuovo-Mumford Regularity of Powers of Edge Ideals</i><br>» <b>Advisor:</b> Tai Huy Ha, Ph.D                                |                                                                         |
| <b>January 2012</b>                                                                                                                                  | <b>Istanbul Technical University - M.Sc. in Mathematics Engineering</b> |
| » <b>Thesis:</b> <i>Hilbert Functions, Free Resolutions and Betti Numbers</i><br>» <b>Advisors:</b> Vahap Erdogan, Ph.D, and Sefa Feza Arslan, Ph.D. |                                                                         |
| <b>June 2008</b>                                                                                                                                     | <b>Istanbul University - B.Sc. in Mathematics</b>                       |

## »»» Teaching Experience

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| <b>2021 - 2022</b>                                                                                                                                                                  | <b>University of Utah</b>          |
| » <b>Spring 2022</b> Calculus III, History of Mathematics<br>» <b>Spring 2022</b> Supervised Reading on Algebraic Combinatorics<br>» <b>Fall 2021</b> College Algebra, Calculus III |                                    |
| <b>2017 - 2021</b>                                                                                                                                                                  | <b>University of South Alabama</b> |

- » Calculus I, II & III
- » Linear Algebra
- » Abstract Algebra
- » Graduate Linear Algebra I & II

## »» Publications

- » **Multi-Rees algebras of strongly stable ideals**, with Kuei-Nuan Lin and Gabriel Sosa. (2022) *Collectanea Mathematica* journal version arXiv version
- » **Toric ideals of weighted oriented graphs**, with Jennifer Biermann, Kuei-Nuan Lin, and Augustine O'Keefe. (2022) *International Journal of Algebra and Computation* journal version arXiv version
- » **Rigid Gorenstein toric Fano varieties arising from directed graphs**, with Irem Portakal and Akiyoshi Tsuchiya. (2022) *Collectanea Mathematica* journal version arXiv version
- » **Betti numbers of weighted oriented graphs**, with Beata Casiday. *The Electronic Journal of Combinatorics* 28(2) (2021), #P2.33. journal version arXiv version
- » **Algebraic properties of weighted oriented graphs**, with Jennifer Biermann, Kuei-Nuan Lin, and Augustine O'Keefe. (2021) *Journal of Algebraic Combinatorics* journal version arXiv version
- » **Regularity of powers of edge ideals: from local properties to global bounds**, with Arindam Banerjee and Huy Tài Hà. *Algebraic Combinatorics*, Volume 3 (2020) no. 4, pp. 839-854. journal version, arXiv version
- » **Algebraic properties of toric rings of graphs**, with Huy Tài Hà and Augustine O'Keefe. *Communications in Algebra*, 47:1, 1-16, (2019). journal version, arXiv version
- » **Regularity of powers of unicyclic graphs**, with Ali Alilooee and Selvaraja S. *Rocky Mountain J. Math.*, Volume 49, Number 3, 699-728, (2019). journal version, arXiv version
- » **Regularity of edge ideals and their powers**, with Arindam Banerjee and Huy Tài Hà. *Advances in Algebra. SRAC 2017. Springer Proceedings in Mathematics & Statistics*, vol 277. Springer, Cham, (2018). journal version, arXiv version
- » **Regularity of powers of forests and cycles**, with Huy Tài Hà, and Trần Nam Trung. *Journal of Algebraic Combinatorics*, 42: 1077, (2015). journal version, arXiv version

## »» Submitted Papers

- » **Macaulay2 package: Morse resolutions**, with Trung Chau and Augustine O'Keefe (2023) arXiv version
- » **Barile-Macchia resolutions**, with Trung Chau (2022) arXiv version
- » **A three regime theorem for flow-firing**, with Sarah Brauner, Galen Dorpalen-Barry, Caroline Klivans, and Lisa Schneider (2022) arXiv version
- » **On algebraic and combinatorial properties of weighted simplicial complexes** (2020) arXiv version

## »» Papers in Progress

- » **Barile-Macchia resolutions of path ideals of paths**, with Trung Chau and Kyle Wang
- » **Barile-Macchia resolutions of monomial ideals with at most 5 generators are minimal**, with Trung Chau and Lia Smith
- » **Normal polytopes arising from weighted oriented graphs**, with Jennifer Biermann, Kuei-Nuan Lin, and Augustine O'Keefe
- » **Regularity and degree of connected graphs**, with Jennifer Biermann, Augustine O'Keefe, Joseph Skelton, and Gabriel Sosa
- » **Stirling permutations and the lucky statistic**, with Aleyah Dawkins, Jennifer Elder, Pamela E. Harris, Kimberly Harry, Dorian Smith, and Bridget Eileen Tenner

## »»» Other Publications

- » **A Conversation on Meet a Mathematician and Math For All**, with Padi Fuster (2021) in Practices and Policies: Advocating For Students of Color in Mathematics, Pamela E. Harris and Aris Winger. CreateSpace 2021.

## »»» Sponsored Research

|                    |                                                            |                     |
|--------------------|------------------------------------------------------------|---------------------|
| June 2022          | Collaborate @ICERM                                         | Visiting Researcher |
| Aug 2021, Feb 2022 | ICERM Research Community in Algebraic Combinatorics (RCAC) | Fellow              |
| July 2019          | Mathematical Sciences and Research Institute               | Visiting Researcher |
| June 2016          | Vietnam Institute of Advanced Study in Mathematics         | Visiting Researcher |

## »»» Grants

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|-------------|--------------------------------------------------------------------|
| 2022 - 2023 | NSF, Fields Institute, and AARMS, Conference Grants for CAAC 2023  |
| 2021 - 2023 | AMS-Simons Travel Grant                                            |
| 2021 - 2022 | ICERM, Fellowships for RCAC                                        |
| 2021 - 2022 | COMMIT Four Corners, Conference Grant for WITP                     |
| 2019 - 2022 | MAA Tensor Grant for Girls in Math Program                         |
| May 2021    | TPSE Math Funding for Meet a Mathematician                         |
| 2019 - 2020 | MSRI, Summer Research in Mathematics Collaboration Grant           |
| Nov 2019    | University of South Alabama, Faculty Development and Support Award |

## »»» Student Research

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|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| » | Trung Chau (Graduate student, University of Utah)                                                                                                                       | Fall 2021– present                           |
| » | Lia Smith (Undergraduate student, University of Utah)                                                                                                                   | Fall 2022– Spring 2023                       |
| » | Aidan Bucko, Nick Van Fleet, Josie Marshall, Kayden Perez, Kiyanna Porter, Amelia Walden, and Deborah Wooton (Science Research Initiative Students, University of Utah) | Fall 2021– present                           |
| » | Rachel Hilarides (Undergraduate student, University of South Alabama)                                                                                                   | Spring 2021 – Spring 2022                    |
| » | Beata Casiday (Undergraduate student, Yale University)                                                                                                                  | Fall 2019 - Fall 2020, Summer 2023 – present |
| » | Kayla Johnson (Masters student, University of South Alabama)                                                                                                            | Spring 2019 - Spring 2020                    |

## »»» Recent Talks

|                                                                                      |                   |
|--------------------------------------------------------------------------------------|-------------------|
| » Algebra Seminar, West Virginia University                                          | April 2023        |
| » Discrete Math Seminar, Texas State University                                      | April 2023        |
| » Recent Developments in Comm.Algebra Session, AMS Sectional at Georgia Tech         | March 18-19, 2023 |
| » Mathematics Colloquium, Hunter College                                             | February 2023     |
| » Topological and Combinatorial Methods in Comm. Algebra Session, JMM 2023           | January 4-5, 2023 |
| » Algebraic, Geometric, and Topological Combinatorics Session, AMS Sectional at UTEP | September 2022    |
| » Macaulay 2 Workshop, Cleveland State University                                    | May 2022          |
| » Undergraduate Seminar for Science and Math Students, Westminster College           | April 2022        |
| » Virtual AMS Spring Eastern Sectional Meeting Virtual, Tufts University             | March 2022        |
| » MAA Intermountain Section Speaker, Virtual                                         | March 2022        |
| » Algebra and Combinatorics Seminar, Tulane University                               | March 2022        |
| » Virtual Combinatorial Algebra meets Algebraic Combinatorics, Fields Institute      | January 2022      |
| » Undergraduate Math Colloquium, University of Utah                                  | January 2022      |
| » Undergraduate Math Seminar, Colgate University                                     | December 2021     |
| » Algebra Seminar, University of Utah                                                | November 2021     |
| » Algebra Seminar, Bilkent University, Turkey                                        | October 2021      |
| » Algebra and Discrete Math Seminar, Clemson University                              | September 2021    |
| » NTAG Seminar, Simon Fraser University, Canada                                      | June 2021         |
| » Departmental Colloquium, Gebze Technical University, Turkey                        | May 2021          |
| » Commutative Algebra Seminar, Jagiellonian University, Poland                       | April 2021        |
| » Algebra Seminar, University of Connecticut                                         | April 2021        |

### »» Recent Conferences and Workshops Attended

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|------------------------------------------------------------------------------------|------------------------------|
| » Interactions Between Top. Combinatorics and Comb. Comm. Algebra Workshop at BIRS | April 2023                   |
| » GEMS of Combinatorics Workshop at AIM                                            | March 2023                   |
| » MathFest                                                                         | August 2021 and Augusts 2022 |
| » MSRI Workshop on Math and Racial Justice                                         | June 2021                    |
| » NAM Faculty Conference on Research and Teaching Excellence                       | May 2021                     |
| » paraDIGMS Fall & Spring Conference                                               | Nov 2020 & April 2021        |
| » Workshop in Combinatorial Algebraic Geometry at ICERM                            | February 2021                |

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|-------------------------------------------------|--------------|
| » Advocating for Students of Color, AMS Webinar | Fall 2020    |
| » AWM Working Towards Change Workshop, JMM 2020 | January 2020 |

### »» Recent Conferences and Workshops Organized

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| » Math for All, Salt Lake City Satellite                                                                                           | February 2023 |
| » 2023 Combinatorial Algebra Meets Algebraic Combinatorics                                                                         | January 2023  |
| » AWM Research Symposium, Special Session on Combinatorial and Homological Methods in Commutative Algebra, University of Minnesota | June 2022     |
| » Virtual AMS Spring Western Sectional, Special Session Commutative Algebra                                                        | May 2022      |
| » Workshop for Inclusive Teaching Practices in SLC                                                                                 | April 2022    |
| » Virtual Math for All, Salt Lake City Satellite                                                                                   | February 2022 |
| » Virtual AMS Fall Southeastern Sectional Meeting                                                                                  | November 2021 |

### »» Community Projects and Events

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|------------------------------------------------------------------------------------------|-------------------------|
| » <b>Meet a Mathematician!</b> , Co-Founder                                              | March 2020 - present    |
| » <b>Math For All SLC Satellite</b> , Co-Organizer                                       | 2022-2023               |
| » <b>MEET and SHARE: A Mathematicians' Storytelling Event at JMM 2023</b> , Co-Organizer | January 5, 2023         |
| » <b>GSAC EDI Book Club</b> , Co-Organizer                                               | Summer 2022             |
| » <b>Summer Research in Mathematics Program in Turkey</b> , Co-Organizer                 | Summer 2021             |
| » <b>Girls in Math Day Program @ South 2018 &amp; 2019</b> , Co-Founder and Co-Director  | 2018 - 2021             |
| » <b>Panel discussion "What comes after #MeToo?"</b> Organizer and Moderator             | April 2018              |
| » <b>#MeToo Panel Discussion, Democracy Day</b> , Organizer and Moderator                | March 2018              |
| » <b>Girls Exploring Math and Science</b> , Keynote Speaker and Workshop Leader          | November 2017           |
| » <b>Girls Who Code Club at South</b> , Founder and Facilitator                          | 2017 - 2021             |
| » <b>AWM Student Chapter @ South</b> , Faculty Advisor                                   | Fall 2017 - Spring 2021 |

### »» Professional Service

**2021 - 2023** **University of Utah**

#### Departmental Committees

- » EDI Committee
- » EDI Survey Subcommittee, Chair

**2017 - 2021** **University of South Alabama**

## College Committees

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- » Summer Professional Development Awards Committee
  - » Diversity Committee
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## Departmental Committees

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- » Outreach Committee
  - » Curriculum Committee
  - » Library Committee
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## Scholarly Review

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- » Journal of Combinatorial Theory Series A
  - » Journal of Algebraic Combinatorics
  - » Journal of Algebra
  - » Electronic Journal of Combinatorics
  - » Proceedings of the AMS
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