

BYEONGSU YU

Texas A&M University - Department of Mathematics

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EDUCATION

Ph.D. in Mathematics

Advisor: Dr. Laura Felicia Matusevich

Texas A&M University

May 2022(expected)

M.Sc. in Mathematics

Advisor: Dr. Woong Kook and Dr. Hyuk Kim (Co-advising)

Seoul National University

Aug 2017

B.B.A. in Business Administration

B.Sc. in Mathematics

B.A. in Philosophy

Yonsei University

Aug 2015

PUBLICATIONS

1. *Shape-Preserving Dimensionality Reduction: An Algorithm and Measures of Topological Equivalence*

Byeongsu Yu and Kisung You

Submitted



2. *Standard pairs for monomial ideals in semigroup rings*

Laura Felicia Matusevich and Byeongsu Yu

J. Pure Appl. Algebra, Vol. 122, no. 9, pp.107036, 2022



3. *Standard pairs of monomial ideals over non-normal affine semigroups in SageMath*

Byeongsu Yu

J. Softw. Algebra Geom., Vol. 11, no.1, 11-1, pp.129–142, 2021



4. *A study on establishing legal causation of collective hazardous substances cases in a statistical viewpoint*

Dohyun Park and Byeongsu Yu

공익과 인권 (en: Public Interest and Human Rights), Vol. 15, pp. 209-261, 2015



SOFTWARE

1. *StdPairs: Library for symbolic computation over a monomial ideal of an affine (non-normal) semigroup with SageMath*

Byeongsu Yu



2. *TDakit: Toolkit for Topological Data Analysis with R*

Kisung You and Byeongsu Yu



TALKS AND PRESENTATIONS

POSTERS

When is the quotient of a semigroup ring by a monomial ideal Cohen–Macaulay?

Southwest Local Algebra Meeting 2022

Baylor University

Feb 2022



Standard pairs for monomial ideals in semigroup rings

Algebra, Geometry and Combinatorics Day - XVIII

UIUC

Mar 2020



TALKS

When is \mathbb{Z}^d -graded modules of affine semigroup rings Cohen–Macaulay?

CombinaTexas 2022

Texas A&M Univ.

Mar 2022



When is the quotient of a semigroup ring by a monomial ideal Cohen–Macaulay?

• Graduate Algebra Symposium	📍 (Virtual)	📅 Nov 2021	
• KU Combinatorics Seminar	📍 The University of Kansas	📅 Apr 2021	🔗
• Algebra and Combinatorics Seminar	📍 Texas A&M Univ.	📅 Apr 2021	
➤ <i>Contravariant functor appearing on monomial ideals of affine semigroup rings</i>			
• Categories and Companions Symposium	📍 (Virtual)	📅 Jun 2021	🔗
➤ <i>Monomial ideals in affine semigroup rings</i>			
• CombinaTexas 2021	📍 Texas A&M Univ.	📅 Feb 2021	🔗
• Graduate Algebra Symposium	📍 (Virtual)	📅 Oct 2020	🔗
➤ <i>Universal Property via Yoneda Lemma</i>			
• Graduate Student Seminar	📍 Texas A&M Univ.	📅 Nov 2019	
➤ <i>Generalized Ishida Complex</i>			
• Algebra and Combinatorics Seminar	📍 Texas A&M Univ.	📅 Nov 2019	
➤ <i>Integrate $xy(x+y)$ over \mathbb{Z}_p with Haar measure</i>			
• Gathering in Graduate Expository Mathematics (GIGEM)	📍 Texas A&M Univ.	📅 Feb 2019	🔗
➤ <i>Topological Data Analysis on Single-Nucleotide Polymorphism data</i>			
• Graduate Student Seminar	📍 Texas A&M Univ.	📅 Nov 2018	
➤ <i>Effective Resistance Preserving Isomorphism</i>			
• Graduate Student Seminar	📍 Texas A&M Univ.	📅 Oct 2017	🔗

TEACHING & MENTORING

- *Explorations in Mathematics (MATH 167) – Instructor* 📍 Texas A&M Univ. 📅 Fall 2020, Fall 2021, Spring 2022
Gave lectures via face-to-face and online simultaneously, wrote lecture notes and 4 exams, wrote weekly quizzes, held weekly office hours.
- *Business Calculus (MATH 142) – Instructor* 📍 Texas A&M Univ. 📅 Summer(1st) 2020, Spring 2020
Gave lectures via face-to-face and online, wrote/graded 3 midterm exams and a final exam, wrote weekly quizzes, held weekly office hours.
- *AWM Peer Mentor* 📍 Texas A&M Univ. 📅 Fall 2019 – present 🔗
Peer-mentor for the first-year mathematics graduate students to help them adapt to new environment and responsibilities.
- *Directed Reading Program Mentor* 📍 Texas A&M Univ. 📅 Spring 2020, Fall 2019 🔗
Discussed weekly with an undergraduate mentee to study mathematical topics outside of the undergraduate coursework.
- *Engineering Calculus I/II (MATH 151/152) – Teaching Assistant* 📍 Texas A&M Univ. 📅 Summer(2nd) 2020, Fall 2019, Summer(2nd) 2018, Summer 2021
Wrote/graded weekly Python lab assignments and solution sets, and weekly quizzes.
- *Functions, Trigonometry and Linear Systems (MATH 150) – Teaching Assistant* 📍 Texas A&M Univ. 📅 Spring 2021, Spring 2019, Fall 2018
Lead weekly recitation, wrote and graded biweekly quizzes.
- *Engineering Mathematics III (MATH 251) & Business Calculus (MATH 142) & Applied Algebra (MATH 433) – Grader* 📍 Texas A&M Univ. 📅 Summer 2019, Summer(1st) 2018, Spring 2018
Graded (bi)weekly assignments or quizzes.
- *Linear Algebra (MATH 304/311/323) – Help Session* 📍 Texas A&M Univ. 📅 Fall 2017
Tutoring undergraduate students about junior-level linear algebra courses.

SERVICE & OUTREACH

Student Working Seminar for Algebraic Statistics

Organizer

📅 Fall 2021

CombinaTexas 2021

Session Chair

📅 Feb 20-21, 2021

Student Working Seminar for Algebra and Geometry

CO-Organizer (w. Pablo Ocal)

📅 Fall 2020, Fall 2021



American Mathematical Society Graduate Student Chapter

Vice Preseident

📅 Fall 2019 - Spring 2020

Student Working Seminar for Category Theory

Organizer

📅 Summer 2019 - Fall 2019



CombinaTexas 2019

Session Moderator

📅 Mar 23, 2019

Integral Bee

Volunteer

📅 Mar 26, 2018

STEMFest

Volunteer

📅 Feb 3, 2018

High School Math Contest

Volunteer

📅 Oct 21, 2017

Math Circle

Volunteer

📅 Fall 2017 - Spring 2018

AWARDS & HONORS

➤ *Best Prize in Undergraduate Research*

📅 Sep 2014

📍 Yonsei Univ. (Computational Science and Engineering)

➤ *Award of Excellence in Economics Dissertation Contest*

📅 Nov 2009

📍 Maeil Business Newspaper (Seoul, South Korea)

BUSINESS EXPERIENCE

➤ *38 Securities - Intern*

📍 Quincy, MA.

📅 Jan 2015 - Feb 2015

Developing algorithmic option trading application using open C++ API from Interactive Brokers.

➤ *Ars Praxia (former: TREUM) - Research Intern*

📍 Seoul, Korea.

📅 Jan 2013 - Jul 2013

Implemented a time-series analysis of a semantic network generated from 492,754 mentions on Twitter related to two elections, the Seoul city mayoral election of 2011 and the South Korean presidential election of 2012.

➤ *17th Division, Republic of Korean Army - Sergeant*

📍 Seoul, Korea.

📅 Feb 2011 - Nov 2012

- Squad leader for the human resource department of the headquarters of the 307 th independent artillery battalion.
- Reported the quinquennial financial status of the battalion for the financial audit of the Korean Army Headquarters.

LANGUAGES

English, Korean



LaTeX/TikZ



Python, SageMath, Macaulay2



C++

