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. *Generalized Ishida complex*
   👤 Laura Felicia Matusevich, Erika Ordog and **Byeongsu Yu**
   In preparation
2. *Cohen–Macaulay quotients of affine semigroup rings by monomial ideals*
   👤 Laura Felicia Matusevich and **Byeongsu Yu**
   In preparation
3. *Shape-Preserving Dimensionality Reduction: An Algorithm and Measures of Topological Equivalence*
   👤 **Byeongsu Yu** and Kisung You
   Submitted
4. *Standard pairs of monomial ideals over non-normal affine semigroups in* SageMath
   👤 **Byeongsu Yu**
   J. Softw. Algebra Geom. (accepted)
5. *Standard pairs for monomial ideals in semigroup rings*
   👤 Laura Felicia Matusevich and **Byeongsu Yu**
   Submitted
6. *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

🗃 *Standard pairs for monomial ideals in semigroup rings*
   • Algebra, Geometry and Combinatorics Day - XVIIII   📍 UIUC   📅 Mar 07, 2020

TALKS

❯ *Contravariant functor appearing on monomial ideals of affine semigroup rings*
   • Categories and Companions Symposium   📍 Virtual   📅 Jun 2021

❯ *When is the quotient of a semigroup ring by a monomial ideal Cohen−Macaulay?*

- KU Combinatorics Seminar   📍 The University of Kansas   📅 Apr 2021

❯ *When is the quotient of a semigroup ring by a monomial ideal Cohen−Macaulay?*
- Algebra and Combinatorics Seminar   📍 Texas A&M Univ.   📅 Apr 2021

❯ *Monomial ideals in affine semigroup rings* ↗
- CombinaTexas 2021   📍 Texas A&M Univ.   📅 Feb 2021

❯ *Monomial ideals in affine semigroup rings* ↗
- Graduate Algebra Symposium   📍 (Virtual)   📅 Oct 2020

❯ *Universal Property via Yoneda Lemma*
- Graduate Student Seminar   📍 Texas A&M Univ.   📅 Nov 2019

❯ *Generalized Ishida Complex*
- Algebra and Combinatorics Seminar   📍 Texas A&M Univ.   📅 Nov 2019

❯ *Integrate $|xy(x+y)|$ over $\mathbb{Z}_p$ with Haar measure* ↗
- Gathering in Graduate Expository Mathematics (GIGEM)   📍 Texas A&M Univ.   📅 Feb 2019

❯ *Topological Data Analysis on Single-Nucleotide Polymorphism data*
- Graduate Student Seminar   📍 Texas A&M Univ.   📅 Nov 2018

❯ *Effective Resistance Preserving Isomorphism* ↗
- 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
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.

SERVICES & OUTREACH

CombinaTexas 2021
Session Chair   📅 Feb 20-21, 2021
Student Working Seminar for Algebra and Geometry ↗

CO-Organizer (w. Pablo Ocal)	📅 Fall 2020
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 ●●●●●

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LaTeX/TikZ ●●●●●
Python, SageMath, Macaulay2 ●●●●○
C++ ●●●○○

ACADEMIC REFEREES

👤 *Dr. Laura Matusevich* ↗
   ● Professor 📍 Department of Mathematics at Texas A&M University ✉ laura at tamu.edu

👤 *Dr. Sarah Witherspoon* ↗
   ● Professor 📍 Department of Mathematics at Texas A&M University ✉ sjw at tamu.edu

👤 *Dr. Catherine Yan* ↗
   ● Professor 📍 Department of Mathematics at Texas A&M University ✉ cyan at math.tamu.edu