UNDERGRADUATE MATH SEMINAR

The next math seminar will be

DATE: <mark>**THURSDAY, May 4**</mark>

Time & **12:30 –** Refreshments in **Bailey 204**

Location: **12:50 – 1:45** Seminar in **Bailey 207**

In this seminar, **Daniel Gallagher** from the Department of Mathematics at **University of Massachusetts - Amherst** will present the following

Title: One Cut to Rule Them All?

Abstract:
If we start with a flat rectangular piece of paper, then fold it a few times, and make one single straight cut, what shapes can we make? It is fairly easy to make a square or triangle, but it takes more work to fold and cut some nonconvex polygons. In this talk we will see if it is possible to fold and cut any two dimensional shape formed by straight lines. If you are coming to the talk, bring your scissors and we will see what shapes we can make!
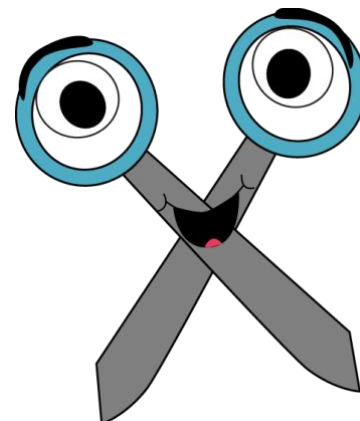
Pieces from Thesis – by Yixuan Liu

Yixuan *wrote his senior thesis this winter term, supervised by Professor Jue Wang.*

In the winter term 2023, I wrote my thesis about animation character articulation and deformation advised by Professor Jue Wang. In this thesis, I explored the general methods of articulating animated characters, from the simplest Bezier curve to the mean value coordinates and harmonic coordinates. The Bezier curve is a spline that is used in computer graphics to draw different shapes and is often used in creating smooth curves by defining controlling points and parameters. The barycentric coordinates allow people to express the position of points within any simplex, such as triangle in 2D and tetrahedron in 3D. And the more generalized coordinates from the barycentric coordinates is the mean value coordinates, which are valid for any polygons. Finally, I explore the harmonic coordinates, which are used in Pixar's animations such as *The Incredibles* and *Ratatouille.*

The thesis writing process is challenging, but it is valuable. The biggest difference between a normal math course and thesis writing is the self-exploration. At the beginning of the writing, the only thing that I know is the goal to explore the harmonic coordinates. To reach this purpose, I read through the paper from Pixar and keep notes on every important concept. Then I did more readings based on these concepts, and finally constructed a logical process from the simplest Bezier curve to these coordinates. For the future thesis writing students, I would say it is normal to feel struggling and confused. The important thing is to keep exploring and communicate more with your supervisor - they are always there to help you.

Calculus Help Center: Spring Term Hours
Sunday, Tuesday, and Thursday: 7:30-10:00pm
Sorum House Seminar Room

Fall Term Preregistration: Pre-Approval, Advising Begin this Week

In preparation for Fall 2023 registration, a new-system dubbed "Pre-Approval" is replacing the old "Waitlisting" system. This process will allow student to get "pre-approved" and registered for select courses whose enrollments are managed by their departments. In the math department, **Math 105, 110, and 113** are the courses that require pre-approval. The complete list of courses across the college that require pre-approval can be found at https://www.union.edu/advising-registration/pre-approval-courses.

To get pre-approved, students need to complete a form for each department is offering such courses. The above website has links to the individual departmental pre-approval forms/surveys.

The timeline for Pre-Approval, advising, and fall term registration is as follows:
- May 10: Pre-Approval surveys are due from students
- May 17: Departments submit rosters to the Registrar for pre-enrollment
- May 22: Regular registration period begins.

OVERARCHING this: **Weeks 6, 7, and 8** – students meet with their Academic Advisor and obtain registration clearance.

Courses beyond calculus: This fall, the Math Department will be offering several interesting courses beyond the calculus sequences that are suitable for math majors and minors.

- **Math 199** is the department's "bridge course," intended to help students make the transition from computationally oriented courses to more theoretical proof-writing courses. This is a **required** course for all math majors and minors that is *usually* taken after Math 115.
- **Math 219 – Discrete Mathematics**. In this course, topics studied may include graph theory, partially ordered sets, the Four-Color Theorem, and more. As a 200-level course, Math 219 is appropriate for students coming from Math 199, as well as more advanced students.
- **Math 221** – **Mathematical Cryptology**. This course will provide an in-depth look at the mathematical theory underlying modern methods to accomplish the secret transmission of data. This is another good choice for students coming from Math 199, as well as more advanced students. Note that students generally may not take both Math 221 and Math 235 (Number Theory) – choose wisely!
- **Math 336 – Real Variable Theory.** is a core course that is **required** for math majors. In this course, you will learn some of the theoretical underpinnings of the calculus of functions whose domain lies within the set of *real* numbers.

Design the Next MAA T-Shirt, Win a Prize!

The MAA is looking for creative designs for the new MAA t-shirt! In the past, these shirts have been funny, mathematically sound, and worn with tremendous pride by our members. Past design winners have received a free shirt, recognition on MAA social media accounts, and royal bragging rights. This year's selected designer will also win a $50 Amazon gift card! Additionally, the t-shirt will be sold at MAA MathFest 2023. Ready to submit your design? Be sure to do so by **midnight (PDT) May 12.** For questions relating to the contest, contact communities@maa.org.

VIEW GUIDELINES AND SUBMIT NOW!