YIKAI TENG

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EDUCATION

University of Illinois at Urbana-Champaign *August 2018 - Present*
Major in Mathematics, Minor in Computer Science Expected: May 2021
Dean's List: Fall 2018 - Spring 2020 GPA: 3.94

ACADEMIC INTERESTS

I am interested in Differential Geometry and Geometrical Topology, in particular, low-dimensional topology, 3-manifolds, and knot theory.

TEACHING EXPERIENCES

Course Aide: Numerical Methods *August 2019 - Present*
- Teach theory behind numerical methods and help around 300 students in this Python-based course.
- Assist the professor with in-class activities and help develop and revise homework assignments.
- Host weekly office hours, aid around 20 students with their academic problems.
- Help create and revise online notes for numerical methods and build class website.

RESEARCHES AND PROJECTS

Independent Research *January 2020 - Present*
Independent Research Project, Under Professor Bruce Reznick, U of I.
- Work on the generalization of Arnold's Cat Map on various dimensions and spaces.
- Focus on the group of measure preserving self maps on arbitrary dimensional tori $\mathbb{T}^n$, and its relation to the mapping class group, $\mathcal{MCG}(\mathbb{T}^n)$.
- Create Mathematica visualizations of generalized Cat Map.

Illinois Geometry Lab *January 2019 - September 2019*
Visualization Project, Under Professor AJ Hildebrand, U of I.
- Study the coupon collector problem and coupon collector randomness test and visualize such problems by Mathematica.
- Simulation accepted by Wolfram demonstration.

EXTRACURRICULA COURSES

Complex Algebraic Curves *January 2020 - Present*
Reading Project, Under Professor Steven Bradlow, U of I.
- Study the foundation and properties of complex algebraic curves, both algebraically and topologically, including Bézout's Theorem, the degree-genus formula, etc.
- Study complex algebraic curves as Riemann surfaces and related theorems like Abel's Theorem and the Riemann-Roch Theorem.

Complex Analysis in a Geometric Approach *August 2019 - December 2019*
Reading Project, Under Professor Richard Laugesen, U of I.
- Apply classical Complex analysis in geometry to study particular metrics like Poincare, Caratheódory, and Kobayashi metric.
- Compare the geometry in complex analysis with classical differential geometry to study the cross

sections of the two fields.
• Study harmonic mappings in the complex domain and its application to minimal surface theory.

Modern Theory of Dynamical Systems *August 2019 - December 2019*
Reading Project, Under Professor Eduard-Wilhelm Kirr, U of I
• Study advanced modern theory of dynamical systems, particularly the behavior around a hyperbolic fixed point, like the Hadamard-Perron Theorem and the Hartman-Grobman Theorem.
• Conduct the proof of the existence of the Lake of Wada as a group of four.

ADDITIONAL ACTIVITIES

HackIllinois *February 2019*
• Compose tests for LinearMappings package for Julia and add add support for Quaternion Numbers.
• Compose various tests and make multiple contributions to the DoubleFloat package for Julia.

Mechmania *Septempber 2019*
• Develop a strategy of a board game to compete with other contestants.

Mathematical Contest for Modelling *February 2020*
• Construct a math model to predict where Scottish herring will migrate for the next few decades and provide suggestions for fishing companies in Scotland.