Spring 2019 Projects

Azucena Garvia	A* algorithm	Combinatorics / Graph Theory
Sarah Pathan	Abstract Algebra: Groups	Algebra
Tochi Ololo	Alcuin's River Crossing Puzzle	Combinatorics / Graph Theory
Jose Luis Guzman	Algebraic Topology	Algebra, Topology
Ashwin Devaraj	An Introduction to Complexity Theory: P, NP, and Reductions	Combinatorics / Graph Theory, Algorithms
Anirudh Nair	Basics of Reinforcement Learning	Statistics
Quinn Simonis	Calculus of variations	Analysis
Vrinda Rajkumar	Clustering	Statistics
Daniel Mancia	Computational Topology	Topology
Ethan Jana	Convex Geometry	Geometry
Christopher Izzo	Cosets and Lagrange's Theorem	Algebra
Teegan Simonds	DNA and Knot Theory	Topology, Mathematical applications to biology specically DNA
Trey Minor	Dynamical Systems and the Poincare Disk	Dynamical Systems
Mauricio Montes	Euler Characteristic of Surfaces	Topology
Michael Lange	Finding the fundamental group of the circle using homology	Algebra, Topology
Bill Zan	Finite-State Automata	Combinatorics / Graph Theory
Valerie Barboza	Foundational Crisis: From Euclid to Gödel	Discrete mathematics
Suyun Ha	Fragile Watermarking with Number Theoretic Transforms	Algebra, Image Processing
Jacob Gutierrez	Groups and Graphs	Groups and graphs
Abrar Anwar	Grover's Algorithm: An Introduction to Quantum Computing	Computer Science
Stefani Barre	Hilbert Space and Riesz Representation Theorem	Analysis

Emily Tallman	Interpretable Matrix Decompositions	Statistics, Numerical Analysis
Yangxinyu Xie	Introduction to Support Vector Machines	Statistics
Manisha Ganesh	Ising Model and Metropolis Monte Carlo	Mathematical Physics, Numerical Analysis
Raeann Rojas	Knots: To Infinity and Beyond!	Topology
Raghav Venkataramanan	Lie Algebras in Physics	Mathematical Physics
Andrew Kim	Linear Regression	Probability, Statistics, Machine Learning.
Sahana Vinayak	Lorenz equations	Dynamical Systems
Thomas G Herben	Machine Learning: Process with a Focus on the Mathematics of Trees and Tree-Based Models	Statistics, Machine Learning
Ben Maccini	Matching Networks for One Shot Learning	Deep Learning
Daniel Naves	Metric Spaces and the Heine-Borel theorem	Analysis
Courtney Smith	Morse Inequality	Topology
Vishnu Nair	Numerical Linear Algebra: Decomposition Methods	Analysis, Numerical Analysis
Shannon Scofield	On the Finiteness of Ramsey Numbers	Combinatorics / Graph Theory
Co Tran	Optimization methods for solving Lasso problem	Statistics, Analysis, Numerical Analysis
Zachary Gardner	Poincare Duality	Topology, Geometry
Demetrius Rowland	Principal Component Analysis	Statistics
will sherwood	Products + Equalizers --> Pullbacks	Algebra, Topology, Geometry
Kevin Cherucheril	Proof of the Nullstellensatz	Algebra
Blake Holman	Random Graphs	Combinatorics / Graph Theory
Tasneem Dollar	Statistics in HPV Clinical Trials	Statistics

Cameron Walsh	Step Aside, Bill: Quantum Gates and Their Role in Quantum Cryptography	Mathematical Physics, Cryptography
Sam Weston	Stochastic Integration	Financial Math
Seongyong Kim	Sturm-Liouville Problem	Differential Equations
Olivia Ott	The Brouwer Fixed Point Theorem	Topology
Claire Mirocha	The Infinite Electorate: An Introduction to Ultrafilters	Analysis, Set theory
Leon Liu	Topological Hochschild Homology and its applications	Geometry, Number Theory
Dane Rohrer	U(1) Symmetry of Maxwell's Equations	Mathematical Physics
Reese Lance	Vector Bundles and Principal Bundles. What's the connection?	Topology, Geometry
Thor Preimesberger	Weaving Path Integrals into Quantum and Statistical Mechanics	Mathematical Physics
Vijay Venu	what the zeta function has to do with quantum fluctuations	Mathematical Physics