Eastern Undergraduate Mathematics Conference 2014

November 15, 2014

Schedule of Events

All talks will occur in Room 104 of the Science Building.

9:30-10:00 Complimentary breakfast and registration in the Science Building main lobby.

10:00 Opening Welcome.

10:05-10:50 Knots, Numbers, and Hair Color. John Burke (Rhode Island College).

Abstract: This talk will be an introduction into the way that modern mathematicians use invariants. In this talk we will define what an invariant is and figure out how they can be used to distinguish criminals, family members and different types of knots.

11:00-11:45 Patterns That Do Not Last. Keith Conrad (University of Connecticut).

Abstract: In science, the usual benchmark for a result to be accepted is that it can be confirmed by repeated experiments. The situation in mathematics is completely different: for a result in math to be considered valid, it requires a proof based on logical reasoning. Numerical evidence alone is not enough. Why does math have this stricter standard? Shouldn’t a mathematical pattern or formula that is correct 100 times be correct all the time because it has been “proved” experimentally? We will look at examples of patterns in mathematics that last hundreds, thousands, or even billions of times before eventually breaking down.

11:45-1:45 LUNCH BREAK. Lunch will be served in the Student Center Cafe.


Abstract: We develop a single growth model by using Schnute’s postulates as a starting point (Schnute: Can. J. Fish Aquat. Sci. 38 (1981) 1128-1140). The model is developed using basic undergraduate calculus. We test the effectiveness of the growth model by including it in a larger model (reaction-diffusion-advection model) and applying it to a model selection technique that uses evolutionary algorithms. The algorithm is validated (with success) against ecological field data sets of the Zebra mussel invasion of Lake Champlain in the United States.

2:40-3:25 Lattices, Quadratic Forms and Signals. Glenn Henshaw (LaGuardia Community College, CUNY).

Abstract: Lattices are highly symmetric arrangements of points. Examples of lattices can be found throughout nature, from beehive construction to crystal structures. In this talk we will discuss the connection between lattices, quadratic forms, and arithmetic problems.
in general. We will also learn about a special class of lattices called well-rounded lattices. Finally we will discuss an application to maximizing signal-to-noise ratio of some types of transmissions.


Abstract: The Euler characteristic of a geometric shape is a number that describes the geometry of that object regardless of the way it is bent. It can be defined for graphs, polyhedra, and in general for CW-complexes. I'll discuss some applications of Euler characteristic in real world problems.

4:20 Closing Remarks.