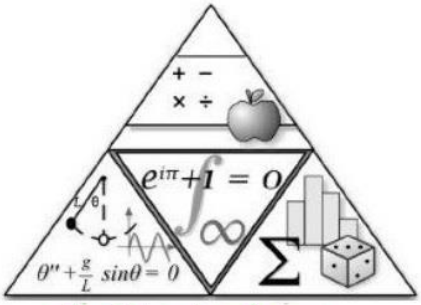
Mathematics Colloquium Lecture Series



The University of Guam
College of Natural and Applied Sciences
Division of Mathematics and Computer Science

on *both Fridays, October 19 and 26, 2018,* at *4:15 –5:30 p.m. in SC 200*

The *Research Experience for Undergraduates* (REU) program will present

A Student Workshop on Applied Mathematical Modeling and Computer Application

The *UoG REU Program* at the Division of Mathematics and Computer Science, led by Dr. JaeYong Choi, Dr. Hideo Nagahashi and Dr. Hyunju Oh, is a Summer research opportunity for students of *mathematics and/or computer science.*
This 2-day workshop will present *4 short talks* about the work of participants.
After the talks there will be a *panel discussion* of the REU Program with the aim of motivating and attracting qualified students to participate.
Please, send your question to the email address: zszekely@triton.uog.edu, attn: REU colloquium

Program: October 19:

4:15: Introduction
4:30: *Dog Vaccinations and Quarantine: A Mathematical Approach on Rabies*
Presenters: Vince Campo and John Palacios
5:00: *Evaluating Typhoon Haiyan's Performance and Identifying Storm Surge Prone Areas in Key Locations Across the Philippines Using Advanced Circulation (ADCIRC) Model*
Presenter: Nilo Espinoza

October 26:

4:15: refreshments
4:30: *Evaluating the Cost of Crowdsourced Computer Vision Data*
Presenter: Gabrielle Aguilar
5:00: *Analyzing Rota virus Vaccination using Game Theory*
Presenters: Jacob Aquiningoc, Robert Babac, and Jayson Morales

Abstracts:

1. *Dog Vaccinations and Quarantine: A Mathematical Approach on Rabies*

Presenters: Vince Campo and John Palacios

The talk presents a model of the spread of the deadly disease rabies. Using data based in China, the employed mathematical model describes the dynamics of the disease and proposes a model to help better understand how the disease is spread. By utilizing game theory the talk offers a strategy for individual dog owners on separate methods of battling rabies, including vaccine and quarantine.

2. *Evaluating Typhoon Haiyan's Performance and Identifying Storm Surge Prone Areas in Key Locations Across the Philippines Using Advanced Circulation (ADCIRC) Model*

Presenter: Nilo Espinoza

Typhoon Haiyan (2013) was one of the most catastrophic natural disasters on record in the Philipines. The Advanced Circulation (ADCIRC) numerical model is used to hindcast and evaluate Typhoon Haiyan. Three synthetic typhoons are created to identify storm surge prone areas. Results from the simulations showed the relationship between Typhoon Haiyan's characteristics in the generation of storm surge. This research is intended to assess the performance of ADCIRC to be used in predicting storm surge from typhoons in the future.

3. *Evaluating the Cost of Crowdsourced Computer Vision Data*

Presenter: Gabrielle Aguilar

Analyzing the trade-off between informative data and the higher costs of crowdsourcing.

4. *Analyzing Rota virus Vaccination using Game Theory*

Presenters: Jacob Aquiningoc, Robert Babac, and Jayson Morales

Rotavirus is a highly contagious virus that causes severe diarrhea in young children and is spread through the fecal-oral route. Two vaccines, Rotarix (RV1) and a neonatal vaccine (RV3-BB) have been shown to be effective in decreasing the occurrence of severe gastroenteritis disease. We analyze the transmission of rotavirus through a mathematical model and construct a game theoretical model to determine the optimal vaccination policy.

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The Challenges in Mathematics Colloquium Lecture Series is organized by the Division of Mathematical Sciences of the Colleges of Natural and Applied Sciences of the University of Guam. Our location is at the Division of Mathematical Sciences in Warehouse B, next to the Health-Science Building. Our intention is to introduce a wider audience of those who are interested in mathematical challenges into state-of-the-art mathematical theories, puzzles and open problems. We invite students, colleagues working in any area of science and everybody who wants to learn more about mathematics in an accessible setting.

Everybody is welcome!