



STUDENT RESEARCH CONFERENCE

University of Houston-Downtown



SAMPLE UNDERGRADUATE ABSTRACTS

1. Stabilization of Thiol/Acrylate Systems Using N-PAL

Hilda Hinojosa, Christopher Lopez, Colin Carandang, and Lucio Patino

Dr. Byron Christmas, Research Mentor, Center for Applied Polymer Science Research, UHD

Abstract: Using *tris*-nitroso-N-phenylhydroxylamine (N-PAL) as a free radical polymerization inhibitor, an investigation was conducted to characterize the shelf-life stability and relative reactivity of UV-polymerizable, thiol/acrylate-based formulations containing various concentrations of N-PAL. These formulations were characterized for their relative reactivity using differential photocalorimetry (DPC) techniques. The shelf-life stability data generated thus far indicate that N-PAL provides adequate stability without significantly reducing the relative reactivity of the formulations.

2. The Good Samaritan

Tudon Martinez, Alisha Romero

Dr. Heidi Ziemer, Research Mentor, Department of Social Sciences, UHD

Abstract: We studied whether gender determines the likelihood of a driver stopping to assist a casually dressed gentleman stranded on the side of the road. Many studies report differences between men and women when helping others is involved. The probable explanation lies in the nature of the help required in the situation. Active doing, spontaneous, and anonymous acts are more likely to be carried out by men than by women. Women are more likely to help than men when helping is more planned, formal, personal, and less likely to involve direct intervention. We considered a number of variables: situation, type of help necessary, time of the day, physical condition of the person offering help, and previous experiences. Some studies have found that interveners in several kinds of dangerous events had more exposure to crime, both in personal experience and in witnessing others' victimization, they were also taller, heavier, better trained to cope with emergencies (e.g. trained in life saving skills, medical and/or police trained) and were more likely to see themselves as physically strong, aggressive, emotional and principled.

3. Diatoms as Indicators of Wetland Mitigation Success

David Lang

Dr. Brad Hoge, Research Mentor, Department of Natural Sciences, UHD

Location: UHD, Greens Bayou Wetlands Mitigation Bank, and Anahuac National Wildlife Refuge

Abstract: Diatoms were chosen to assess wetlands mitigation success in The Greens Bayou Wetlands Mitigation Bank, a project of The Harris County Flood Control District. Diatoms respond rapidly to environmental changes, thus diatom succession provides a good model of wetland mitigation success. Samples were collected from surface water and the first 10 centimeters of soil at the GBWMB and The Anahuac National Wildlife Refuge, a relatively undisturbed wetland comparable to those at the GBWMB. Results show statistically different assemblages at the GBWMB compared the ANWR. These results suggest the GBWMB, although planted with climax community plants, is still undergoing succession.

4. Combating Spam Through Proofs of Effort

Cyril Harris III

Dr. Ping Chen, Research Mentor, Department of Computer and Mathematical Sciences, UHD

Abstract: Spam is rapidly degrading the value of the Internet. Current methods to block spam are becoming less and less effective. Because of this several researchers from Microsoft Research proposed a new type of solution at Crypto 2003. To combat spam these researchers proposed that prices be accompanied with the act of sending email. These prices are easy to verify proofs of computational effort which would be hard to compute for the sender but easy to verify for the receiver.

5. Lower Bounds on the Matching Number of Bipartite Graphs

Iride Gramajo

Dr. Ermelinda DeLaVina, Research Mentor, Department of Computer and Mathematical Sciences, UHD

Abstract: This presentation is a summary of an undergraduate research project in graph theory that involved resolving conjectures on the matching number of bipartite graphs generated by a computer program called Graffiti.pc, designed by Dr. Ermelinda DeLaVina. One main objective of this project was to obtain a collection of lower bounds on the matching number involving other easily computed graph invariants, which collectively predict the matching number of bipartite graphs. We present the collection of lower bounds obtained. A couple of the results were found in texts and research papers, and some were mathematical applications of Hall's Marriage Theorem and Berge's M-Augmenting Path Theorem; however, many were resolved with seemingly original strategies.

6. Cheating; Yes Unicellular Organisms Do It Too

Tek Williams and Vedangi Sample

Dr. Akif Uzman, Faculty Mentor, Department of Natural Sciences, UHD

Dr. Gad Shaulsky, Research Mentor, Department of Molecular and Human Genetics, Baylor College of Medicine

Abstract: Altruistic behavior is exhibited in *Dictyostelium* during reproduction. This form of group selection, also observed in higher organisms, ensures that genetic traits shared by a related group of individuals persist through subsequent generations via the sacrifice of some members. Certain mutations often become over-represented compared to other mutants. Mutants were created using restriction enzyme-mediated integration. Cultures containing different mutants were randomly mixed, then allowed to undergo 10 rounds of replication. Cultures were then characterized using cheating assays to screen for dominant mutants. *Dictyostelium* strain AX4 was used to compare the level of cheating. Swindling ones way into the spores ensures that your genetic make up will be directly passed on to the next generation.

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