Dear Faculty, Students & Alums,

We hope you had a great February and enjoyed the days off we had for that month. As NYC and the world at large continues to learn more about the 2019 novel coronavirus (COVID-19) and how to properly defend against it, CUNY has suspended all classes from now until **March 19th. After the 19th, CUNY will resume classes via online, distance learning.** As a result, our "Back-to-School" event for the M.S. Program in Data Science has been cancelled. However, we will still hold our "Open House" event, but we will do so in an online capacity. To find out more about that event, please find the "Upcoming Events" section. Lastly, it is important that you keep yourself aware about any updates on COVID-19 prevention as well as its effects on your academic life. More info can be found here: https://www.cuny.edu/coronavirus/

**RECENT NEWS**

**Dist. Prof. Sos Agaian co-chaired the conference “Image Processing: Algorithms and Systems XVIII”:** Last month, Distinguished Professor in Computer Science Sos Agaian co-chaired the “Image Processing: Algorithms and Systems XVIII” conference in San Francisco. He also chaired sessions on “Scene Understanding,” “Image and Video Processing,” and “Medical Image Processing.”

**Prof. Soon Ae Chun named co-editor of the new journal Digital Government: Research and Practice:** Launched on February 25, "Digital Government: Research and Practice" (DGOV) is an open access journal launched by the Association for Computing Machinery that delves into the impact of technology on governance and public institution.

**Thesis Proposal: "NEW APPROACHES TO FREQUENT AND INCREMENTAL FREQUENT PATTERN MINING" by Mehmet Bicer, February 21, 2020. Abstract:** While there has been a lot of work done on frequent itemset mining on structured data, very little work has been done on unstructured data. Combining the ideas from Boyer-Moore Horspool, Rabin-Karp and Raita algorithms, we created a new hybrid pattern search algorithm, Double Hash, which can potentially be used in frequent itemset mining on unstructured data in the future. Double Hash was faster than all three algorithms aforementioned for any type of short or long patterns in all of our tests. We will present our work and test results on this as well.
**WEEKLY SEMINARS**

**DATA SCIENCE & APPLIED TOPOLOGY SEMINARS:**

**February 7, 2020: Multiplierless Iteration for the Resolution of Semidefinite Linear Systems - Thao Nguyen** - This talk looked at increasing the efficiency of algorithms of numerical analysis by showing that a linear system of equations with a matrix that is symmetric and positive semidefinite can be iteratively solved with an algorithm where every multiplication is reduced to a scaling by a power of 2. A demonstration took place displaying how this multiplierless algorithm can be used in various problems, such as least squares, l1 regularized least squares, and the minimal-norm resolution of any consistent linear system.

**February 21, 2020: Evasion and Coverage Problems - Mikael Vejdemo-Johansson** - An overview of previous work using topological methods to attack the coverage and the evasion problems.

**Thesis Proposal: "MODELING AND ANALYSIS OF AFFILIATION NETWORKS WITH SUBSUMPTION" by Alexey Nikolaev, February 7, 2020. Abstract:** In this proposal, we introduce the notion of affiliation network with subsumption, in which no affiliation can be a subset of another. Therefore the addition of a new affiliation subsumes all previously existing affiliations that are subsets of it. A network with this property can be modeled by an abstract simplicial complex whose facets are the affiliations of the network. In recent years, simplicial complexes have been employed in the modeling of various natural and social phenomena; however, facet subsumption and its effect on the network evolution was not extensively studied. We propose to explore several aspects of affiliation networks with subsumption.

**Thesis Proposal: "IMPROVED LEARNING IN A MOBILE ROBOT VIA ADVERSARIAL STYLE TRAINING" by Todd Flyr, February 7, 2020. Abstract:** This dissertation proposal involves work on improving machine learning techniques on a physical, mobile robot. Developing a labeled training corpus for a skill based learning task can be difficult, given the need to run a large number of physical trials specifically for that task. Methods to address this problem which include semi-supervised learning and simulation, all have nontrivial drawbacks. I propose augmenting a small labeled dataset composed of physical trials with trials generated from a generative adversarial network (GAN) which has been trained on that dataset, then exploring how to build a robust machine learning architecture based on that premise. Preliminary work on a basic task, in particular, learning how to strike a ball towards a target, shows that the additional data generated by the GAN improves the performance of the robot.
CATEGORICAL THEORY SEMINARS:

February 19, 2020: Higher-Order Categorical Logic: From Section 1.7 and on - Nossen S. Yanofsky, Brooklyn College, CUNY - This continuation of Introduction to Higher-Order Categorical Logic by J. Lambek and P.J. Scott looked at Polynomial categories and Kleisli categories of cotriples, as well as coproducts in Cartesian closed categories and natural number objects.

February 26, 2020: The Universal Property of the Bar Construction - Todd Trimble, Western Connecticut State University - The Bar Construction was discussed in this seminar, delving into the bar construction as a universal acyclic simplicial algebra.

Upcoming Events

March 12, 2020. M.S in Data Science OPEN HOUSE - We are organizing an “Open House” event for the M.S. Program in Data Science, offering prospective students the chance to learn about our program, meet our faculty and staff, and become familiar with our admission requirements. Due to concern over the COVID-19, we will conduct this event online: bit.ly/2vcWGV4. 6:00 PM to 7:00 PM.

Upcoming Deadlines for New Opportunities

March 18: The Graduate Center is hosting an event titled Inside the Graduate Center: A Dissertation Showcase on May 19. Graduate students that are defending this spring or have already defended during the 2019-2020 year are invited to give a three minute long, one slide presentation of their dissertation to the audience, which will consists of colleagues from academia, publishing, and public policy.


March 30th: The Computer Science Teaching Association is holding a conference for CS educators to network and share their pedagogical experiences. There are scholarships available to help educators attend the conference as well.

https://www.cvent.com/events/2020-csta-annual-conference/event-summary-236d288a403041f8a7a935b0bd74131c.aspx
**Job Opportunity:** Columbia University’s Summer Program for High School Students [precollege.sps.columbia.edu] is hiring teachers and TA's for intensive courses in JAVA and C programming. Compensation would be $7000 for course instructors and $2000 for teaching assistants. Applicants would need to have U.S. work authorization.

If interested, please send a CV and any formalized student feedback you may have to Mark Blacher at mb548@columbia.edu.

**Job Opportunity:** The NYC Office of Labor Policy and Standards is seeking a Data Scientist to play a key role in the enforcement of groundbreaking new legal protections for workers. The Data Scientist will work closely with the Office’s investigation and litigation teams to develop and implement strategies for the discovery, collection, and analysis of employer data (e.g., records from timekeeping, scheduling, payroll, and other operational or administrative systems), assess all aspects of how OLPS uses data in its investigations and litigation, and recommend and implement improvements.

Contact Niki Culma @ NCulma@dca.nyc.gov

We look forward to sharing more monthly highlights of developments at the department with more exciting seminars, events, and important announcements. For more updates, check us out on Facebook, Twitter, and the department website!