WELCOME

CUNY CELEBRATES
WOMEN IN COMPUTING

An ACM Event

May 10, 2019

MICROSOFT, 11 TIMES SQUARE, NEW YORK, NY

Ada Lovelace

Katherine Johnson

Annie Easley

Grace Hopper

Sister Mary Kenneth Keller

Anita Borg

https://cunycwic.github.io/CUNYWiC2019/

ACM-W COUNCIL ON WOMEN IN COMPUTING

Mission Statement

ACM-W supports, celebrates, and advocates internationally for the full engagement of women in all aspects of the computing field, providing a wide range of programs and services to ACM members and working in the larger community to advance the contributions of technical women. http://women.acm.org

Celebrations of Women in Computing

Imagine yourself surrounded by 200 computer science students, all ready to network and share their experiences! Our ACM Celebrations of Women in Computing showcase women involved in the computing industry and computer science research, encourage mentoring and networking, include career fairs and panel sessions, and create opportunities for undergraduate and graduate students to present their research and projects through poster competitions and presentations. More than 30 celebrations throughout the US and the world inspire women to excel in their chosen field--find one near you or start a new one! Our newest events are in Spain, Cyprus, Russia, and Serbia. http://women.acm.org/celebrations

Student scholarships to attend research conferences

For women undergraduate or graduate students in computer science and related programs, this exposure to the computer science research world can encourage them to continue on to the next level, whether it's undergraduate to graduate, Masters to Ph.D., or Ph.D. to an industry or academic position. There are 6 award cycles per year, with travel stipends of $600 or $1,200 depending on conference location. This can be supplemented by the student's home department or a Special Interest Group if it's a SIG conference. http://women.acm.org/scholarship

Chapters

ACM-W has both student and professional chapters. The student chapters build a support network for students at schools worldwide and provide leadership opportunities in a nurturing atmosphere that can include social activities, games, competitions and awards, talks by visiting lecturers, and more. Professional chapters provide opportunities for practitioners to connect in their local area, which is particularly valuable for women who work in companies that do not have a group dedicated to their needs. College and university faculty are also welcome to join professional chapters. We hope that chapter members will join ACM, the association for computing professionals, which will be a rich resource throughout their entire careers. Find one of our more than 150 chapters or start a new one! http://women.acm.org/chapter

Our Supporters

We are grateful to Microsoft for providing the space for the conference, and for their continued support to celebrate and advocate for women in computing.

We are grateful to the faculty and students of CUNY colleges for making this conference possible.

We are grateful to WiTNY director and staff for their time and assistance in the organization of the conference.

We are grateful for the participation of faculty and students from these institutions.

Baruch College
Borough of Manhattan Community College
Bronx Community College
Brooklyn College
The City College of New York
College of Staten Island
Cornell Tech
The Graduate Center, CUNY
Hunter College

John Jay College
LaGuardia Community College
Marist College
Mount Holyoke College
New York City College of Technology
Pace University
Queens College
Saint Peter's University

CUNY CELEBRATES WOMEN IN COMPUTING

MAY 10, 2019
MICROSOFT, 11 TIMES SQUARE, NEW YORK, NY

	AGENDA	
8:15-9:15 AM	**Registration and Breakfast**	*Room*
9:30-10:00 AM	**Welcome** Sandie Han, math department chair, New York City College of Technology Susan Imberman, University Associate Dean for Technology Education at City University of New York Ted Brown, executive director, CUNY Institute for Software Design and Development Judith Spitz, Founding Program Director: Women in Technology and Entrepreneurship in New York (WiTNY) at Cornell Tech Microsoft Representative	*6501*
10:00-10:50 AM	**Keynote Presentation** Nicola Palmer, Head of Technology & Product Development, Verizon	*6501*
11:00-12:30 PM	**Morning Concurrent Sessions** • Panel Sessions • Diversity Presentation • Workshops	*6608* *5202* *5411* *5412* *6203*
12:30-1:30 PM	**Lunch**	*6th floor lobby*
1:30-2:30 PM	**WiTNY Careers in Tech Panel** Shoma Chakravarty, Vice President Enterprise Architecture, Verizon Dwana Franklin-Davis, Vice President, Tech Operations Service Delivery, Mastercard Alison Cheu, Senior Security Analyst, Accenture Xiao Ma, PhD Candidate in Information Science, Cornell Tech	*6501*
2:30-3:15 PM	**Break, Networking, Dessert** **Poster Presentations**	*6th floor lobby*
3:15-4:15 PM	**Afternoon Concurrent Sessions** • Education/Pedagogy/Diversity • Research • Data Science • Technology/Engineering • First-Timer Talks	*5313* *5323* *6202* *6203* *5202*

KEYNOTE SPEAKER

Nicola Palmer
Head of Technology & Product Development, Verizon

Nicola (Nicki) Palmer is senior vice president of technology & product development for Verizon. Nicki oversees the growth and expansion of the 5G ecosystem, convening partners and developing products and services to advance 5G growth and device technology. Previously she was responsible for planning, operations & engineering of the nation's largest and most reliable 4G LTE wireless network, the company's 5G residential broadband and 5G mobile network deployments.

Palmer began her career at Bell Atlantic in 1990 and has held a number of leadership positions in engineering, operations, and technology supporting advanced data, I and wireless products. Among many highlights throughout her career at Verizon, she was responsible for the planning, design and operation of global voice, data and IP networks, and also led the engineering and operations of the nation's premier fiber-to-the-premises (FTTP) network, which powers Verizon's FiOS data and TV services.
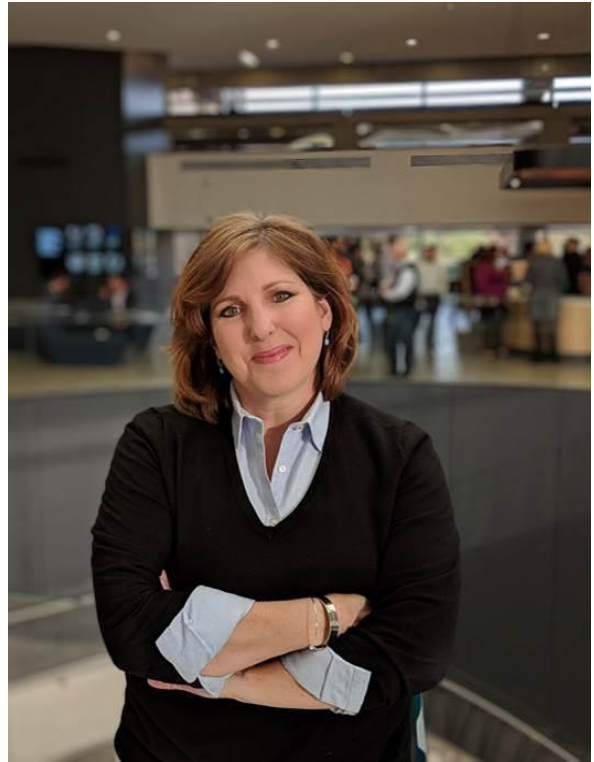
She is active in a number of organizations including the National Academy Foundation, and is a passionate advocate for promoting education and careers in Science, Technology, Engineering and Math (STEM), especially for young women. She has been recognized by Fierce Wireless as one of the industry Women to Watch, a Top 100 CIO/CTO Leaders in STEM by STEMCONNECTOR, and as one of the Most Influential Women in Wireless. Nicki has also been honored by Working Mother magazine and Girl Scouts of Greater New York.

Palmer earned a bachelor's degree in industrial engineering from Penn State University and an MBA from the University of Pennsylvania's Wharton School. She resides in New Jersey with her husband and three children.

WITNY CAREERS IN TECH PANELISTS

Shoma Chakravarty,
Vice President Enterprise Architecture, Verizon

Dwana Franklin-Davis, Vice President, Technical Operations Service Delivery, Mastercard

Dwana Franklin-Davis is a Vice President in the Technical Operations Service Delivery organization focused on Digital. In this global function, she is responsible for the strategy, tools, and process definition in support of the Digital Programs. Dwana joined MasterCard in 2007 as a Senior Software Engineer in web administration, and has since held a variety of leadership roles including Internet Engineering – Web Administration Project Delivery, Global Data Repository Development, Data Quality Support and System & Quality Assurance Testing. Most recently Dwana was a Vice President in the Employee Digital Experience organization where she was responsible for the global strategy and roadmap for IT requirements, internal systems and productivity opportunities for our workforce. Prior to joining MasterCard, Dwana held IT positions with IBM and the May Department Stores Companies. Dwana holds a Bachelor's of Science in Management from Purdue University, a Master's of Information Management from Washington University, and a Certificate in Project Management from Washington University. Dwana and her husband Morry, live in New York City and have 2 children, ages 5 and 3.

Alison Cheu, Senior Security Analyst, Accenture

Alison is a Senior Analyst in Accenture Security where she is aligned with the Digital Identity practice. Currently, she is engaged on a project in the access management space as a change management and functional analyst to introduce automation and analytics to her client. She is also working in Accenture's Blockchain practice on a public partnership with Mastercard, AWS and MercyCorps to introduce a blockchain-based circular supply chain. Alison is always curious and amazed about the space where people and technology intersect. How do people react? Does it get done? Or does it become a burden? How do you mitigate and integrate disruptions? Outside of work, Alison enjoys watching hockey (Go Islanders! Yes! Yes! Yes!), taking scenic hikes and is still trying to get a Guinness World Record. She graduated in December 2017 from CUNY Queens with a degree in Computer Science.

Xiao Ma, PhD Candidate in Information Science, Cornell Tech

Xiao Ma is a PhD candidate at Cornell Tech in Information Science. Xiao's research focuses on computational social science and human-computer interaction, in particular, algorithmic understanding of interpersonal trust using data. In the past, Xiao has interned at Facebook and Airbnb, and she holds a Bachelor of Science degree in Microelectronics from Peking University in Beijing, China.

REGISTRATION AND BREAKFAST
8:15 – 9:15 AM   LOCATION: 6TH FLOOR LOBBY

WELCOME
9:30 – 10:00 AM   LOCATION: CENTRAL PARK WEST 6501

Sandie Han, math department chair, New York City College of Technology
Susan Imberman, University Associate Dean for Technology Education at City University of New York
Ted Brown, executive director, CUNY Institute for Software Design and Development

Judith Spitz, Founding Program Director: Women in Technology and Entrepreneurship in New York (WiTNY) at Cornell Tech
Microsoft Representative

KEYNOTE PRESENTATION
10:00 – 10:50 AM   LOCATION: CENTRAL PARK WEST 6501

Nicola Palmer, Head of Technology & Product Development, Verizon

MORNING CONCURRENT SESSIONS
11:00 AM – 12:30 PM

PANEL PRESENTATIONS   LOCATION: RADIO CITY 6608
11:00 – 11:45 AM

Making it work, conversations with females in computing

Moderator: *Mary Tedeschi, New York City College of Technology*

Panelists
Meshawn DeCoteau, computer systems manager at NYC Department of records and information services
Sylvia Friederich, Professor of Computer Science at Pace University
Erika Kilborn, CEDS Director, Product Education and Training at Casepoint LLC
Bonnie MacKellar, Associate Professor of Computer Science at St John's University
Cynthia Stroh, SCCM Engineer and subject matter expert (SME) in Microsoft products specializing in Configuration Manager. Senior Systems Programmer with major Wall Street firm

11:45 – 12:30 PM

How to Break into Tech

Panelists
Radhika Kalani, Baruch College
Sabrena Sabet, Baruch College
Charusmita Madan, Queens College
Melissa Chan, John Jay
Yasmeen Munasser, Queens College

The "How to Break into Tech" panel will consist of 5 CUNY women pursuing different areas within computer science. Each panelist will discuss how they got involved in tech, WiTNY's role in their academic career, and what they have been doing since to increase diversity in tech. The panelists have attended conferences to connect with professionals and diversify their perspective, have led the technology clubs on their respective campuses, and also helped plan CUNY-wide hackathons. This is going to be an informal panel of mostly juniors and seniors to help females in tech get involved at different CUNY schools, but also provide a sense of mentorship and community. We want to provide other students with support, but also resources that they would have not been exposed to otherwise.

DIVERSITY PRESENTATIONS	**LOCATION: BROADWAY 5202**
11:00 – 11:45 AM	*PRESIDER: Elizabeth Milonas*

Understanding Implicit Bias-Changing the Gender Equity Equation

Patricia Cody, Esq., Chief Diversity Officer, New York City College of Technology
The severe underrepresentation of women majoring in computer science continues to be a national trend. A major change in the gender equity equation is deemed necessary. One method is to promote bias literacy, a term used by the American Association for the Advancement of Science (AAAS), as a way to enhance the institutional climate for women majoring in computing. This presentation will focus on understanding and mitigating implicit bias in computing. This is part 1 of the presentation on Understanding Implicit Bias.

11:45 – 12:30 PM

Understanding Implicit Bias-Bridging the Gender Gap in Computer Science

Sandie Han, Professor and chair of Mathematics department, New York City College of Technology
Urmi Ghosh-Dastidar, Professor of Mathematics/Director of Computer Science, New York City College of Technology
The severe underrepresentation of women majoring in computer science continues to be a national trend. A major change in the gender equity equation is deemed necessary. One method is to promote bias literacy, a term used by the American Association for the Advancement of Science (AAAS), as a way to enhance the institutional climate for women majoring in computing. This presentation will focus on understanding and mitigating implicit bias in computing. This is part 2 of the presentation on Understanding Implicit Bias.

WORKSHOP: GIT AND GITHUB FOR BEGINNERS	**LOCATION: MUSIC BOX 5411**
11:00 – 12:30 PM	*PRESIDER: Ezra Halleck*

(laptop is required for this session)

Elizabeth Rosalen, College Laboratory Technician – Department of Mathematics and Computer Science, Bronx Community College

If you are studying computer science or in any tech field you may have heard a lot of talk about GitHub, but what is it? A lot of students, coding enthusiasts and even professionals in tech fields don't understand what it does, why it's so important, and why they should use it. Want to know what all the fuss is about?

Learning Objective(s): Be able to define what Git and GitHub are and describe their uses and benefits. Create a GitHub account and be able to create a new repository, commit changes, fork an existing repository, send a pull request, and accept a pull request all within the GitHub website environment. Learn basic Git command line prompts through an online interactive tutorial.

This workshop introduces participants to Git and GitHub. The workshop will start with a very short slide presentation, which includes some (also short) YouTube videos. The workshop proceeds quickly to an interactive paired or small group activity in which they will be guided through creating a new repository, committing changes, forking an existing repository, sending a pull request, and accepting a pull request all within the GitHub website environment. Then if

time allows, we will finish with an online tutorial which the students can complete at their own pace in which they can practice using Git within the Command Prompt (on Windows) or Terminal (on Mac).

Students are encouraged to bring their own laptops with Git and GitHub Desktop pre-installed if they want more in-depth practice. Students will also need to be able to work in pairs or small groups

WORKSHOP: CREATING SERIOUS ROBOTS THAT HELP SOCIETY
11:00 – 12:30 PM   **LOCATION: WINTER GARDEN 5412**
                                                            PRESIDER: Yu Wang

Susan Imberman, University Associate Dean for Technology Education; Director CUNY Advanced Initiative for Technology Education (CAITE)
Mohammad Azhar, Assistant Professor, Borough of Manhattan Community College

Number of students – 10 groups of 4 for a total of 40 students. Students DO NOT need laptops.

In this workshop we will learn about robots and some of the ethical issues that surround them. We will then work in groups to create a "sticky bot" or a prototype robot made from sticky notes. Our robots will help society by helping with elder care, the environment, medical care, or search and rescue missions. In the last part of the workshop, we will share our robots and our ideas with the group.

PRESENTATION: RLAB   **LOCATION: BELASCO 6203**
11:00 – 11:45 AM   *PRESIDER: Urmi Ghosh-Dastidar*

Alexis Seeley, Director of Education and Opportunity Programs at RLab

The RLab, 16,500 square feet of co-working labs, classrooms, studios, and more, is the nation's first city-funded center for research, entrepreneurship and education in virtual and augmented-reality, spatial computing and other emerging media technologies. Details of various programs and opportunities in VR/AR and spatial computing will be discussed in this presentation.

LUNCH
12:30-1:30 PM   **LOCATION: 6TH FLOOR LOBBY**

PANEL PRESENTATION
1:30 – 2:30 PM   **LOCATION: CENTRAL PARK WEST 6501**

Moderator: *Amy Furman, Director of Strategic Planning and Operations, WiTNY, Cornell Tech*

Panelists
Shoma Chakravarty, Vice President Enterprise Architecture, Verizon
Dwana Franklin-Davis, Vice President, Tech Operations Service Delivery, Mastercard
Alison Cheu, Senior Security Analyst, Accenture
Xiao Ma, PhD Candidate in Information Science, Cornell Tech

TOWARDS ACCURATE INSTANCE-LEVEL TEXT SPOTTING WITH GUIDED ATTENTION
Haiyan Wang, The City College of New York
Faculty mentor: Yingli Tian, The City College of New York

Accurate Pulmonary Nodule Detection
Jingya Liu, The City College of New York
Faculty mentor: Yingli Tian, The City College of New York
Simulation as a Predictor in Probability
Xiaona Zhou, New York City College of Technology
Faculty mentor: Satyanand Singh, New York City College of Technology

Using SnapPy to study 3-manifolds
Alice Kwon, CUNY Graduate Center

Mobile Autonomous with Ultrasonic sensor and Arduino Microcontroller
Christine Grace, Jose Villanueva, New York City College of Technology
Faculty mentor: Yu Wang, New York City College of Technology

Comparison Between Relational and Non-Relational Database
Nahid Arman, New York City College of Technology
Faculty mentor: Elizabeth Milonas, New York City College of Technology

Assistive Robot for Deaf-Hearing Communication using Microsoft Kinect and NAO Robot
Mehmet Sahin, Mohammad Azhar, Borough of Manhattan Community College
Faculty mentor: Mohammad Azhar, Borough of Manhattan Community College

Sign-Language Games Using Humanoid Robots for Hearing-Impaired Children
Karan Yang, Aleena Tim, Halizah Sukriyanto, Mohammad Azhar,
Borough of Manhattan Community College
Faculty mentor: Mohammad Azhar, Borough of Manhattan Community College

Kinetic Study of Amine Cured Epoxy Resins
Xiaona Zhou, Xiaolan Wu, New York City College of Technology
Faculty Mentors: Urmi Ghosh-Dastidar, Diana Samaroo, New York City College of Technology; Swati Neogi,
Indian Institute of Technology, Kharagpur

Mathematical Art Visualizations
Meryem Elbaz, Gabrielle Langston, New York City College of Technology
Faculty mentor: Boyan Kostadinov, New York City College of Technology

Data Analysis and Visualization of Heart Disease Patient Data
Dahiana Jimenez, Afis Animashaun, New York City College of Technology
Faculty mentor: Boyan Kostadinov, New York City College of Technology

EDUCATION/PEDAGOGY/DIVERSITY

PRESIDER: Ezra Halleck   **LOCATION: MARQUIS 5313**

3:15 – 3:30 PM

Applying Computer Science in Biology: A Model for Incorporating Interdisciplinary Pedagogical Approaches through ePortfolio in the First Year Experience at LaGuardia Community College
Yun Ye, LaGuardia Community College
Authors: Na Xu, Charles Keller, Yun Ye, LaGuardia Community College

This paper describes the use of ePortfolio as a platform for an interdisciplinary, collaborative course project for First Year Seminar (FYS) students in an Engineering and Computer Science FYS class (ECF090), and in a Liberal Arts: Math and Science FYS class (LMF101). This project was designed to enrich the integrative research experience of new-to-college students at LaGuardia Community College, whose student body is known for its diverse background, and to engage them in hands-on inquiry and problem solving practice, with a broader goal of increasing the retention rate in STEM majors. An additional goal of this work was to introduce students to the interdisciplinary nature of modern science and encourage them to think of their future career paths in the same context. The major task in the project was to compare RNA sequences using computer programs, in order to facilitate the study of blood cancer. Throughout the project, students in both ECF090 and LMF101 classes applied mathematical skills to perform algorithm analysis on a biological problem and were exposed to the application and basis of relevant technology in Computer Science. Collaborative work was conducted using ePortfolio as an online course platform which hosted all student work and allowed remote communication and collaboration to happen between two classes in different majors. Based on survey feedback, students were impressed by how they could contribute to the task using basic math and computer skills, and interest in continuing their STEM education was expressed unanimously.

3:30 – 3:45 PM

Migrate blocks-based syntax to text interface for programming embedded systems
Yu Wang, New York City College of Technology
Authors: YuZhen Li, Xiaolin Chen, Lance Mercado, Yu Wang, New York City College of Technology

The C/C++ programming languages are widely used in embedded system programming. For those who are new to the programming language and embedded system, it is very challenging to fight the three battles: syntax, logic, and embedded device with peripherals. The block-based syntax is found useful to help novice programmers to start with embedded system programming. We present how to use Blocklyduino, a visual programming editor for Arduino, in the cat robot project. We migrate the code generated by blocks-based syntax to conventional text-based programming language in the embedded system. Unlike traditional programming process, the user does not require an in-depth understanding of the programming logic and syntax, such as declaration, libraries, function, and hardware components. The code is created with the help of visual elements, such as blocks, arrows or symbols. This approach provides a graphical interface for students to learn programming and development boards and sensors. An example of MechaCat shows how to use block-based codes to program and control the embedded multifunction system.

3:45 – 4:00 PM

Towards Gender Equity in Computing
Rumana Syed, Saint Peters University; Farjana Ferdousy, John Jay College
Faculty mentor: Farrukh Zia, New York City College of Technology

Men and women use technology alike. The tech market in NYC is growing over three times faster than any other industry. But in the workforce there is hardly any representation of women; Less than 1% of college women in the U.S. are graduating with degrees in computer science. Since men are not the only tech customers, it is necessary to have women in product design teams. Otherwise chances are the "seat belt design" history will repeat itself. Therefore, the tech world demands an urgent addressing of gender diversity issue. This will not only to offer balance to a male-dominated industry, but also strengthen it.

What role can academia play in addressing gender diversity and leadership in the technology sector? In our presentation we will suggest some ideas for addressing this issue based on our experiences in an academic setting both as students and as instructors.

We suggest addressing this issue by Identifying the problem, targeting the problem: 1) community-based activities: involve the current students in tech fairs, conferences, tech meetups, and tech competitions, 2) curriculum-based activities: supporting the current with peer support/tutoring and encouraging students to get involved in research projects. 3) creating role models and 4) reach out to high school career counsellors to encourage and to support female students in STEM field, and design an introductory course in college that exposes students to computing.

Pathways to Employment Through Industry-informed Computer Science Education: A Public Policy Approach
Robert J. Domanski, New York City Government, Tech Talent Pipeline

A brief overview of the "CUNY 2x Tech" mayoral initiative and the utility of its model as an academic-industry-government partnership. Learnings from this initiative are applicable both at a Departmental level, i.e. the value of industry engagement, as well as at an individual faculty level, i.e. pedagogy and the importance of imparting applied knowledge to students.

RESEARCH

PRESIDER: Satyanand Singh   *LOCATION: MARQUIS 5323*
3:15 – 3:30 PM

Unconditionally Secure Public Key Transport (With Possible Errors)
Mariya Bessonov, New York City College of Technology
Authors: Mariya Bessonov, Dima Grigoriev, Vladimir Shpilrain

We consider a scenario where one party wants to transmit a secret key to another party in the presence of a computationally unbounded (passive) adversary. The legitimate parties succeed with privately controlled probability close to 1 (although strictly less than 1), while a computationally unbounded passive adversary succeeds in correctly recovering the secret key with significantly lower probability.

3:30 – 3:45 PM

Fairness Sample Complexity and the Case for Human Intervention
Alyssa Lees, Google
Authors: Alyssa Lees, Ananth Balashankar, Google

With the aim of building machine learning systems that incorporate standards of fairness and accountability, we explore explicit subgroup sample complexity bounds. The work is motivated by the observation that classifier predictions for real world data sets often demonstrate drastically different metrics, such as accuracy, when subdivided by specific \textit{sensitive variable} subgroups. The reasons for these discrepancies are varied and not limited to the influence of mitigating variables, institutional bias, underlying population distributions as well as sampling bias. Among the numerous definitions of fairness that exist, we argue that at a minimum, principled ML practices should ensure that classification predictions are able to mirror the underlying sub-population distributions. However, as the number of sensitive variables increase, populations meeting at the intersectionality of these variables may simply not exist or

may not be large enough to provide accurate samples for classification. In these increasingly likely scenarios, we make the case for human intervention and applying situational and individual definitions of fairness. In this paper we present lower bounds of subgroup sample complexity for metric-fair learning based on the theory of Probably Approximately Metric Fair Learning.

We demonstrate that for a classifier to approach a definition of fairness in terms of specific sensitive variables, adequate subgroup population samples need to exist and the model dimensionality has to be aligned with subgroup population distributions. In cases where this is not feasible, we propose an approach using individual fairness definitions for achieving alignment. We look at two commonly explored UCI datasets under this lens and suggest human interventions for data collection for specific subgroups to achieve approximate individual fairness for linear hypotheses.

3:45 – 4:00 PM

Computing in holomorphic dynamics
Tao Chen, LaGuardia Community College

Holomorphic dynamics is a field of theoretic research on the infinite iteration of holomorphic maps. Theoretic research will generate great fractals by computing, such as the well-known Mandelbrot set. Moreover, computing helps to provides direction to the research in this field. In this talk, we will try to show how computing help the research in this filed and also introduce new direction in this area.

DATA SCIENCE

PRESIDER: Mohammad Azhar   *LOCATION: AMBASSADOR 6202*
3:15 – 3:30 PM

Optimization of Geometry of Flexible Solar Panels
Malgorzata Marciniak, LaGuardia Community College

The development of solar panels started at the beginning of the 20th century but we still lack a complete understanding of the amount of energy that can be generated from the photovoltaic cells. Just recently, in 2011, MIT researchers announced that they can print photovoltaic cells on a flexible medium and create panels of an arbitrary shape. Since flexible panels are still a novelty little is known about the influence of geometrical shapes on the efficiency of the panel. The project investigates the efficiency of shapes of flexible solar panels from the perspective of simulations based on (mathematical) flux. Calculations are performed with mathematical software. The main challenge of the project is verification, validation and interpretation of the results which motivates participation of multiple students. In addition, a part of the project approximates the solar resource based on data from The National Renewable Energy Laboratory.

3:30 – 3:45 PM

Thermodynamics of Sports
Arame Sow, Enmanuel Valdez, LaGuardia Community College
Faculty mentor: Malgorzata Marciniak, LaGuardia Community College

Our objective in this experiment was to model the temperature variations of the body during a workout. The equipment used was: the thermal camera which is a device that records temperature in the most accurate way, a LabQuest and a sensor were used to compare the data found with the thermal camera, and a chronometer to keep track of the time. The logistic and the exponential models were used to analyze the data. The experiment was done by students at the gym of LaGuardia Community College. Their temperatures were recorded from the stage of rest, through a warmup, to a complete cool down every 10 minutes. Using the law of cooling and heating by Newton, we were able to translate the data to differential equations to simulate the future of the temperature during a certain period of time. All the collected data was analyzed through Maple. Hopefully, we will collect more data on an

extended period of time to analyze the limits of this experiment as the body can only heat up to 45 degrees Celsius (113 Fahrenheit).

3:45 – 4:00 PM

Machine learning and Optimization
Sam Karasik, Data Science Director, Schireson Associates, New York, NY

The latest advances in machine learning and optimization are driving some revolutionary changes in the world of television. As viewers are offered more platforms and content choices, traditional television networks are challenged with adapting to new technologies while continuing to deliver on billions in traditional TV advertising guarantees. Machine learning has some clear applications in forecasting viewership, but much of the complexity arises when machine learning predictions are being used to make short and long-term strategic decisions both inside and outside of automated systems.

4:00 – 4:15 PM

Studying Brain Connectivity using Weighted Graph Comparison
Thierno Amadou Diallo, Alumnus of New York City College of Technology

Studying brain components and its connectivity is an important field in neuroscience. While concepts of weighted graphs are widely used in many areas including computer, social, biological pathways, and air traffic networks, application of weighted graphs to study brain connectivity pattern is relatively new in the field of graph theory. In this project we focus on anatomical connectivity that connects nodes representing regions of interest (ROIs) and the weighted edges associated with structural connectivity *i.e.* the density fibers connecting ROIs. An adjacency matrix using connectivity weights between ROIs is created and Laplacian spectrum analysis and spectral clustering method are used to study the connectivity strength between and within two cerebral hemispheres.

TECHNOLOGY/ENGINEERING

PRESIDER: Susan Imberman   *LOCATION: BELASCO 6203*
3:15 – 3:30 PM

Smart Prosthetics
Xiaolin Chen, Yuzhen Li and Lance Mercado, New York City College of Technology
Faculty mentor: Yu Wang, New York City College of Technology

The field of prosthetics focuses on the development of artificial limbs to help restore functionality to persons who have lost or are missing one or more limbs. At present, modern technology, such as 3D printing and connected devices, can be used to produce advanced prosthetic limbs. Patients in this category can see benefits from the application of connected devices to the area of healthcare devices. These benefits may include the ability of doctors to remotely monitor patients with chronic and long-term ailments, allowing patients themselves to monitor their own data, and allowing caregivers to receive relevant data quickly. With these goals in mind, we designed a 3D printed prosthetic arm that is equipped with smart biosensors, displays, motors, and embedded microcontrollers. An embedded computer will process the collected data with real time computing constraints. The data can be visualized on a LCD. They can transfer to/from our designed Android App via Bluetooth communication. We gain first-hand in-depth embedded computing in engineering project design.

3:30 – 3:45 PM

AFFORDABLE VERBAL COMMUNICATION SYSTEM FOR ASSISTIVE ROBOT
Jairo Molina, Mohammad Azhar, Borough of Manhattan Community College
Faculty mentor: Mohammad Azhar, Borough of Manhattan Community College

A main challenge of human-robot interaction is its necessity of communication. Overlapping robotics and speech recognition provided by artificial intelligence will completely revolutionize the way humans interact with robots, and technology itself. In this paper, we focus on developing a fluid communication solution for affordable assistive robot such as the Turtlebot. Turtlebot is an affordable research robot we can design and implement human-robot interaction for daily tasks for elders. In this research, we are developing speech-to-interaction functionality for the Turtlebot using ROS and AWS. To successfully accomplish this we used an AlexaBot to learn about the infrastructure of speech-to-interaction in a different robot. By using these technologies, the Turtlebot robot will be able to perform tasks such as delivering food to sick people by simply using human speech.

3:45 – 4:00 PM

Collaborative Assistive Humanoid Robots
Karan Yang, Mohammad Azhar, Borough of Manhattan Community College
Faculty mentor: Mohammad Azhar, Borough of Manhattan Community College

We investigate how humanoid robots can assist people with disabilities such as speech and hearing impairment. We work with the NAO robot in our research. NAO is a humanoid robot with high degree of freedom and equipped with full body control and advanced sensors.

Our goal is to explore the possibilities of the humanoid robot to work collaboratively with professionals to provide assistance for people with hearing/speech impairment and rehabilitation at home. Also, the benefits would be a cost-effective system, while providing an emotional support and companion systems to help them gain confidence.

In our work, the robot NAO was programmed to execute two specific tasks in the indoor environment. One is to deliver an object to a destination or to a person. The other task is to make a second NAO robot to mimic the first NAO robot's movement in real time.

For the first task, we programmed NAO by Choreograph and designed interaction to communicate with NAO through voice and image of sign language gestures. Also, we use the method of autonomous obstacle avoidance to enable NAO to search for the target destination. Those features enable the interaction between humans and the robot to flow more naturally and autonomously. For the second task, our approach is to integrate Python shell with Choregraphe to control two NAO robots at the same time. We think this feature could be used for rehabilitation training for multiple patients at the same time with only one supervising physician.

FIRST-TIMER TALKS

PRESIDER: *LOCATION: BROADWAY 5202*
3:15 – 4:15 PM

Cybersecurity for the Internet of Things: vulnerabilities of a smart home doorbell system
Claudia Rojas, Marist College
Faculty mentor: Casimer DeCusatis, Marist College

The Internet of Things (IoT) refers to a network of devices, including consumer electronics, embedded with software, sensors, and network connectivity that enables these objects to collect and exchange data. Recent research suggests that over 50 billion devices will be connected to the IoT by 2020. Such devices often suffer security vulnerabilities, including weak passwords, little or no data encryption, and vulnerable user interfaces or APIs. This are related to resource constraints in the device, such as limited battery power and communication bandwidth, lightweight operating systems, and limited on-device storage which requires a live connection to the public cloud at all times. This has led to IoT devices being compromised by malware and used as spam relays, cryptocurrency miners, and botnets (such as the Mirai botnet which disabled most of the Internet on the east coast of the U.S. in late 2017). In this paper, we discuss security vulnerabilities identified from testing three common smart doorbell products (Skybell, Ring, and Nest). Experimental results include reconnaissance using port scans, and man-in-the-middle attacks using a wifi rogue hotspot to intercept and modify video feed from the doorbell. We show how these devices can be compromised by

botnets, and propose an approach to mitigation using a digital identity management system that provides lightweight authentication, authorization, and nonrepudiation.

Pulse Sensor on FPGA board
Eridson Trinidad, Saleena Azimulla, New York City College of Technology

The objective of this project is to have the FPGA board recognize the signals of a pulse sensor. An additional goal is for the team to have the pulses output on the seven segment displays that are on the board.

Program Arduino with Assembly Language
Mohammed Shakil, New York City College of Technology

The race for powerful computer and efficient programming language is never-ending. A weak and inefficient microcontroller may not be appealing to explore the art of computer architecture from a learner's perspective. In my project, I will use Assembly language to program an Arduino. I will also create short video tutorials so that anyone pursuing to build this project, and improve thereafter, can get the appropriate instructions in the first place.

Arduino Nano (Atmega 328P) is an 8-bit microcontroller with 32kB of flash memory to store Arduino sketches or programs. The Arduino has 32 general purpose registers and each of them is 8-bit (1 Byte) long. In this project, I will demonstrate, how to load these registers with data from memory locations and perform arithmetic tasks all just by using Assembly language. I will also show outputs via LEDs directly connected to the Arduino.

This project can help us rethink the possibilities of small and less powerful hardware. We can observe how data is migrated from memory to registers and how the computer makes decisions by arithmetic operations. My videos can help anyone who is interested in how a computer works and give them insights about computer architecture. Through this project, I will demonstrate, a learner can use their small little Arduino to explore the architecture of a computer and program it by using Assembly programming language.

Exploring the Reliability of the NYC Subway System
Phuong Nguyen, Baruch College

The New York City subway is the largest rapid transit system in the world, servicing approximately 5.5 million riders each day. Recently there has been a growing concern over the state of the subway system due to aging equipment as reflected in system-wide metrics such as "on-time percentage", or how often trains run according to schedule. While these metrics provide some insight into the performance of the subway system, they fail to capture how riders experience the system.

In this project, we use the countdown clock data that logs where each train is reported to be at each minute of the day to gain a better understanding of how riders experience the subway system. We examine wait times and trip times, considering not just average but also worst-case performance. We also compare the subway to above ground travel, and investigate how commute times vary from many points in the city to a common destination. We find that the subway is considerably reliable, but averages can be misleading: variance in subway performance can account for up to a 50% difference between average and worst-case travel times.

A Predictor of Adolescent Suicide Attempts
Xiaoning Wang, Hunter College
Faculty mentor: Susan Epstein, Hunter College

A Machine Learning project used Weka and python. Worked with Professor Susan Epstein and a psychologist on adolescent suicide datasets to predict possible class. Trained models and defined metrics to evaluate the models' performance. Reduced false negative rate by 10% using SMOTE for a minority class in an imbalanced dataset.

Know your Body
Maria De Leon, New York City College of Technology
Faculty mentor: Niloufar Haque, New York City College of Technology

The body is the home that humans have always lived in. It is important to understand how the body works in order to maintain a person's health as a whole. Sleep, exercise, and a healthy diet are the components of a greater future to come. By learning and understanding these three components at present, it will ensure a better life in the future. The present study is designed to evaluate a sample lifestyle of a young Hispanic female aged 19-21 years, and through the data collected understand how one's lifestyle and genetic predisposition can affect future health issues. An understanding of her health parameters will prepare her to perceive changes, if any, she needs to make in the present time to ensure that life later is free of severe health issues. This will help her lead a healthy life by taking charge in her everyday lifestyle. In the end, throughout a healthy process, your body will thank you.

RGB LED Slot Machine with credit system
Joshua I Gutierrez, New York City college of technology
Faculty Mentor: Professor Yu Wang, New York City college of technology

I would like to present my final project. I will be creating a program in C++ and Arduino that uses and manipulates registers to reach your end result. My program will mock a slot machine with RGB LEDs and a digital counter to display credits.

CONTRIBUTED POSTER SESSIONS

TOWARDS ACCURATE INSTANCE-LEVEL TEXT SPOTTING WITH GUIDED ATTENTION
Haiyan Wang, The City College of New York
Faculty mentor: Yingli Tian, The City College of New York

We tackle the text detection problem from the instance-aware segmentation perspective, in which text bounding boxes are directly extracted from segmentation results without location regression. Specifically, a text-specific attention model and a global enhancement block are introduced to enrich the semantics of text detection features. The attention model is trained with a weakly segmentation supervision signal and enforces the detector to focus on the text regions, while also suppressing the influence of neighboring background clutters. In conjunction with the attention model, a global enhancement block (GEB) is adapted to rea- son the relationship among different channels with channel-wise weights calibration. Our method achieves comparable performance with the recent state-of-the-arts on ICDAR2013, ICDAR2015, and ICDAR2017-MLT benchmark datasets.

Accurate Pulmonary Nodule Detection
Jingya Liu, The City College of New York
Faculty mentor: Yingli Tian, The City College of New York

Accurate detection of pulmonary nodules with higher sensitivity and low specificity is essential for automatic lung cancer diagnoses from CT scans. Although many deep learning based algorithms make great progress for improving the accuracy of nodule detection, the high false positive rate (94.7% sensitivity with 8 false positives per scan) is still a challenging problem which limited the automatic diagnose in routine clinical practice. In this paper, we propose a novel pulmonary nodule detection framework based on a 3D Feature Pyramid Network (FPN) to improve the sensitivity nodule detection by employing multi-scale features to increase the resolution of nodules, as well as a parallel top-down path is integrated to transit the high-level semantic features to complement low-level general features. Furthermore, a 2D refinement network is introduced to eliminate the false detected nodule candidates by tracking the appearance changes in continuous CT slices of each nodule candidate. The proposed framework is evaluated on the public Lung Nodule Analysis (LUNA16) challenge dataset and achieves 95.2% sensitivity with 2 false positives per scan of our method. It outperforms state-of-the-art methods and significantly reduces false positives.

Simulation as a Predictor in Probability
Xiaona Zhou, New York City College of Technology
Faculty mentor: Satyanand Singh, New York City College of Technology

In this study we simulate bivariate normal data. We gain intuition about the bivariate normal distribution by comparing the generated data to the associated bivariate normal density surface. We also get results about covariance and correlation. We will use tools from linear algebra to discuss transformations of random normal vectors, and the use of contours.

Using SnapPy to study 3-manifolds
Alice Kwon, CUNY Graduate Center

The study of 3-manifolds is a very active area of research and crucial to study the space we live in. In the 1960s Likorish and Wallace proved that any closed, orientable, connected 3- manifold can be obtained by performing Dehn surgery on a link, which makes the study of knots and links important to the study of 3-manifolds. Today, we can use a program called SnapPy to study the 3-manifolds obtained by drilling knots and links out of a 3-sphere. I will present on how one can use SnapPy to study such 3-manifolds.

Mobile Autonomous with Ultrasonic sensor and Arduino Microcontroller
Christine Grace, Jose Villanueva, New York City College of Technology
Faculty mentor: Yu Wang, New York City College of Technology

This project focuses on the sensors that are mounted on the robot and the Arduino programming. We used the ultrasonic sensor to avoid obstacles and the line sensors to follow the line. The mathematical equation is formed for the ultrasonic sensor to provide the measured distance of an object based on time of flight of sound waves. The PID (Proportional, Integral, Derivative) Controller is applied to a line follower robot. We are able to design, built, and program a mobile autonomous robot utilizing on an Arduino microcontroller, sensors, motors, a logic gate chip SN75441 Quadruple Half-H Driver, and battery power supplies. The computational results allow us to observe the behaviors of each sensor while performing the tasks that the sensors are programmed to do.

Comparison Between Relational and Non-Relational Database
Nahid Arman, New York City College of Technology
Faculty mentor: Elizabeth Milonas, New York City College of Technology

Developing the relational and non-relational database based on the same set of raw data. Designing, implementing and developing the raw data in all three databases: relational Database-ORACLE, Document Stores-MongoDB and Graph Store-Neo4j. Using relational database Oracle which is provided from the traditional DBMS with the solid integrity and consistency. But the massive growth of the data can't be ignorant, which is the beginning of the revelation. More data has been created in last two years than in the entire previous history and traditional database system is not quit supportive handling to this issue. As a solution to this, the NoSQL (Not Only SQL) database have been invented. The purpose of these two databases are similar like create, retrieve, update and manage data but both databases have their pros and cons. Both have advantages and disadvantages over each other. The purpose of this project is to try and compare the differences in use among three systems (Oracle, MongoDB and Neo4j). Why user should use each of these systems? What different view of the data user can get from using these three systems and how a company can be benefited from using all three systems?

Assistive Robot for Deaf-Hearing Communication using Microsoft Kinect and NAO Robot
Mehmet Sahin, Mohammad Azhar, Borough of Manhattan Community College
Faculty mentor: Mohammad Azhar, Borough of Manhattan Community College

Although the research in human-robot communication has been growing, the research in nonverbal communication with robots for people who have hearing or speech disabilities is still in its infancy. In our research, we focus on developing nonverbal communication system for American Sign Language (ASL) speakers with an assistive robot. We employed a humanoid robot, NAO, developed by Aldebaran Robotics as the assistive robot. Microsoft's Kinect hardware has been selected to understand sign language. The recognition of ASL alphabet is a complex task due to such factors as a variety of body types, a self-occlusion of the hand, and an individual nature of gesture positioning. To interpret ASL, we employed Microsoft Kinect's low-cost depth camera and Artificial Intelligence, such as Machine Learning algorithms, to record body language of people when they speak ASL. Our overall goal for this research is to explore how technology like Kinect and NAO Humanoid assistive robot for ASL speakers to help them communicate, as well as support them in their daily lives.

Sign-Language Games Using Humanoid Robots for Hearing-Impaired Children

Karan Yang, Aleena Tim, Halizah Sukriyanto, Mohammad Azhar,
Borough of Manhattan Community College
Faculty mentor: Mohammad Azhar, Borough of Manhattan Community College

To explore the potential role for humanoid robots for the education of hearing impaired young children, we employ the NAO robot to design simple, interactive games to teach sign language through mathematics and color matching games. NAO robot is a humanoid robot developed by SoftBanks and equipped with sensors to make it more human-like. By incorporating NAO's sensors and humanoid features, the learning process will be more entertaining and effective!

Kinetic Study of Amine Cured Epoxy Resins

Xiaona Zhou, Xiaolan Wu, New York City College of Technology
Faculty Mentors: Urmi Ghosh-Dastidar, Diana Samaroo, New York City College of Technology; Swati Neogi, Indian Institute of Technology, Kharagpur

The epoxy resin is a class of polymer containing more than one epoxy group (or cyclic ether) and featuring a broad range of applications in the field of paints and coatings, adhesives, electronics. With utilization of different curing agents including amines, amides, acid anhydrides, phenols and metal oxides, epoxy resins can be hardened via curing reactions. Owing to their excellent mechanical, electrical properties, chemical stability and extensively industrial applications, many chemists have been interested in studying the curing kinetics of epoxy resins. However, one of the major challenges towards the kinetic studies of epoxy resins curing is the high-cost of laboratory simulation of epoxy resins formations. The construction of computer-simulating kinetic models are not only significant to overcome this challenge but also to optimize a better chemical environment and experimental parameters, which ultimately contribute to the success in formation of desired epoxy resin products. Our research focuses on establishing a suitable kinetic model to better study the curing reaction of epoxy resins. Presently, we are working on identifying potential proposed kinetics models based on mathematical analysis on experimental data. Future work will focus on using the functionality and accuracy of the proposed kinetics models to predict both the degree of cure and rate of cure qualitatively and quantitatively.

Mathematical Art Visualizations

Meryem Elbaz, Gabrielle Langston, New York City College of Technology
Faculty mentor: Boyan Kostadinov, New York City College of Technology

The goal of this project is to create mathematical art using the R programming language. The arrangement of leaves on a plant stem is controlled by spirals. This fact is called phyllotaxis and it is a good example of how mathematics can describe patterns in nature. In this project, we will create flowers using phyllotaxis, and if time allows, other forms of mathematical art.

Data Analysis and Visualization of Heart Disease Patient Data

Dahiana Jimenez, Afis Animashaun, New York City College of Technology
Faculty mentor: Boyan Kostadinov, New York City College of Technology

Doctors often study old cases hoping to learn better ways of treating their patients. A new patient who has a health history similar to a previous patient could benefit from undergoing the same treatment. This project investigates whether doctors might be able to group together patients with heart disease to specific treatments using some unsupervised learning techniques.

CUNY Celebrates Women in Computing - CUNYCWiC

Organizing Committee 2019

General Chair	Sandie Han	Mathematics, New York City College of Technology
Sponsor Chair	Judith Spitz	WiTNY, witny.org
	Amy Furman	WiTNT, witny.org
	Maria Dikun	WiTNY, witny.org
Registration Chair	Boyan Kostadinov	Mathematics, New York City College of Technology
Website Chair	Elizabeth Milonas	Computer Systems Technology, New York City College of Technology
Budget Chair	Satyanand Singh	Mathematics, New York City College of Technology
Conference Site Co-Chair	Ariane Masuda	Mathematics, New York City College of Technology
Conference Site Co-Chair	Johann Thiel	Mathematics, New York City College of Technology
Outreach Chair	Urmi Ghosh-Dastidar	Mathematics, New York City College of Technology

Program Chair	Janet Liou-Mark	Mathematics, New York City College of Technology
Student Presentation Co-Chair	Mohammad Azhar	Computer Science, Borough Manhattan Community College
Student Presentation Co-Chair	Yun Ye	Math/CS/Computer Engineering, LaGuardia Community College
Panel Session	Mary Tedeschi	Computer Systems Technology, New York City College of Technology
Workshop	Maria Psarelli	Math and Computer Science, Bronx Community College
Student Presentation	Yu-Wen Chen	Computer Systems Technology, New York City College of Technology
General Committee	Tzipora Halevi	Computer and Information Science, Brooklyn College
General Committee	Ezra Halleck	Mathematics, New York City College of Technology
General Committee	Yu Wang	Computer Engineering, New York City College of Technology
General Committee	Don Wei	Computer Science, Borough Manhattan Community College

Advisory Board

Ted Brown	Professor of Computer Science, Queens College, executive director, CUNY Institute for Software Design and Development
Robert Domanski	NYC Tech-in-Residence Corps
Erik Grimmelmann	NY Tech Alliance, nytech.org
Susan Imberman	University Associate Dean for Technology Education Director CUNY Advanced Initiative for Technology Education (CAITE)
Wendy Powley	ACM-W Celebration Coordinator

Website Designers

Lilian Jimenez	Computer Systems student, New York City College of Technology
Rachel Jamna	Computer Systems student, New York City College of Technology