Flint Student Research Conference
Thursday, April 27, 2017

Kettering University
Mott Community College
Welcome Message from the Coordinators

It is our pleasure to welcome you to the 6th annual Flint Student Research Conference! This conference focuses on recognizing and celebrating the significant contributions of students involved in research and creative activities. Of particular importance, this year’s meeting has broken new ground as both Kettering University and Mott Community College have joined the consortium of participating institutions, truly making this event representative of the entire city of Flint.

In an effort to affirm the value of student scholarship and faculty collaboration, this event has brought over one-hundred seventy talented students (both undergraduate and graduate), faculty advisors, and guests together for a day of sharing, engaging, and learning. The University of Michigan-Flint is extremely excited to host another – in what we hope will be many – Student Research Conference!

This year’s event includes 76 oral and poster presentations, demonstrations, and performances. The conference starts with an early poster session. Immediately following that is an oral session; with presentations as closely categorized by theme as possible. Another poster session and final oral session will conclude the day. All presentation details are included in this program booklet.

Students who have made the decision to participate in this year’s conference truly represent the best and brightest scholars to be found on our respective campuses. Not only have they demonstrated the initiative to rigorously explore complex ideas beyond those taught in the classroom, but they have also bravely accepted the challenge to share their work with the public. This is no easy task. So we offer our hearty congratulations to our students for their many accomplishments.

Faculty advisors from each of the partnering institutions are also to be commended for tirelessly working with our student scholars. In their capacity as advisors, our faculty have offered encouragement, expertise, criticism, and support to student researchers. Through this support, our faculty demonstrate their commitment to carrying on the intellectual traditions that have made our institutions what they are today. To recognize their efforts, faculty advisors are listed following the students’ names with each abstract.

On behalf of the University of Michigan-Flint, Kettering University, and Mott Community College, thank you for supporting this celebration of research and creative!

Sincerely,

The 2017 Flint Student Research Conference Committee:
Andre Louis and Mary Deibis, University of Michigan-Flint
Thomas Creech, Kettering University
Phillip Nulph, Mott Community College
Thursday, April 27, 2017
Flint Student Research Conference
Hosted by the University of Michigan-Flint

SCHEDULE OF EVENTS

8:30 am – 9:00 am  Registration & Continental Breakfast  WSWB Lobby

9:00 am – 9:10 am  Welcome & Opening Remarks  1205 WSWB
   Dr. Vahid Lotfi, Senior Vice Provost and Dean of Graduate Programs
   Announcements

9:15 am – 10:00 am  Poster Session A  WSWB Atrium

10:15 am – 11:15 am  Oral Session A  WSWB 3rd Floor Classrooms

11:30 am – 12:15 pm  Poster Session B  WSWB Atrium

12:30 pm – 1:30 pm  Oral Session B  WSWB 3rd Floor Classrooms

1:35 pm – 1:45 pm  Closing***  1205 WSWB

Boxed lunches will be available in the Tuscola Room for pick up

*Each oral and performance presenter will have 15 minutes to present
** Poster and demo presenters will have 45 minutes to present.
*** During the closing period, we will have a raffle drawing, where six presenters will receive a $25 Amazon gift card. Winner must be present to redeem their prize.
WSWB Classroom Floor Map
POSTER PRESENTATIONS A
(9:15 am – 10:00 am)

WSWB Atrium

Abstract #3
Project Title: Vehicle Dynamics Model of 2016 Kettering University Formula SAE Car
Presenter(s): Curt Bagne, Graduate student
Faculty Sponsor(s): Jennifer Bastiaan, Mechanical Engineering
Institution: Kettering University

Abstract #5
Project Title: The Effect of Campus Emergency Alerts on Distance Perception
Presenter(s): Kathleen Berta, Undergraduate student; Morgan McFarlin, Undergraduate student; Jason Lawson, Undergraduate student
Faculty Sponsor(s): William McKibbin, Psychology
Institution: University of Michigan-Flint

Abstract #8
Project Title: Moving Forward: The Role of Grit and Self-Regulation on Academic Progress
Presenter(s): Nickolas Bovitz, Undergraduate student; Ryan Griffiths, Undergraduate student
Faculty Sponsor(s): Brian Littleton, Psychology Dept/Fine Arts Social Science Division
Institution: Mott Community College

Abstract #10
Project Title: The Electoral College Should be Abolished
Presenter(s): Rhashon Cargile, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #11
Project Title: Effectiveness of a Community-Based Cycling Intervention for Parkinson’s Disease on Motor Symptoms and Quality of Life
Presenter(s): Ashley Carignan, Graduate student
Faculty Sponsor(s): Nathaniel Miller, Psychology
Institution: University of Michigan-Flint

Abstract #17
Project Title: Assessment of Strength Deficits Following Femoral Intramedullary Rod Placement in a Twelve-Year-Old Male Athlete: A Case Report
Presenter(s): Christin Curtis, Graduate student; Molly Schab, Graduate student; Holly Tipp, Graduate student; Brittni Cruse, Graduate student
Faculty Sponsor(s): Jennifer Blackwood, Physical Therapy; Ryan Bean Physical Therapy
Institution: University of Michigan-Flint
Abstract #19
Project Title: Hydraulic Press
Presenter(s): Chad Fares, Undergraduate student; Drew Snyder, Undergraduate student; Raed Abuaita, Undergraduate student; Nicholas Parks, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract #20
Project Title: History through Art
Presenter(s): Melissa Foether, Undergraduate student
Faculty Sponsor(s): Jjenna Andrews, Art; Brian Littleton, Psychology
Institution: Mott Community College

Abstract #21
Project Title: Schizophrenia: Case Study
Presenter(s): Morgan Goodman, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #23
Project Title: Gender Null Effects on Affect after Receiving Compliment
Presenter(s): Andi Hammond-Chaffin, Undergraduate student; Rachel Murley, Undergraduate student; Devin Willis, Undergraduate student; Jordan Inman, Undergraduate student
Faculty Sponsor(s): Terrence Horgan, Psychology
Institution: University of Michigan-Flint

Abstract #24
Project Title: Do practices quizzes relate to better exam scores?
Presenter(s): Miranda Hanson, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #28
Project Title: A Secondary Analysis of the Behavioral Impacts of Policy and Community Education on Proper Child Car Seat Usage
Presenter(s): Deepika Kandasamy, Graduate student
Faculty Sponsor(s): Rie Suzuki, Public Health and Health Sciences; Michelle Macy, School of Medicine - University of Michigan-Ann Arbor
Institution: University of Michigan-Flint

Abstract #29
Project Title: PTSD and Firefighting Operations.
Presenter(s): Jack Kelley, Undergraduate student
Faculty Sponsor(s): Brian Littleton, Psychology
Institution: Mott Community College
Abstract #30
Project Title: Is Happiness Related to GRIT
Presenter(s): Janine Keyes, Undergraduate student; Megan McGee, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology; Brian Littleton, Psychology
Institution: Mott Community College

Abstract #32
Project Title: Is Conscientiousness Related to GPA
Presenter(s): Hannah Livingston, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #33
Project Title: Characterization of co-digestion of pickle waste and primary sewage sludge in single-stage and two-stage anaerobic digestion processes
Presenter(s): Taylor Lowe, Undergraduate student
Faculty Sponsor(s): Michelle Ammerman, Biology
Institution: Kettering University

Abstract #34
Project Title: The study of the correlation between Age and Self-Actualization
Presenter(s): Jilian Lueker, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #35
Project Title: The Effects of third-hand smoke on children
Presenter(s): Spencer MacLeod, Undergraduate student
Faculty Sponsor(s): Mark Valacak, Public Health & Health Sciences
Institution: University of Michigan-Flint

Abstract #39
Project Title: Siblings and Personality Development
Presenter(s): Manon McCullough, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #43
Project Title: X-Y ShakerTable
Presenter(s): Corynn ODea, Undergraduate student; Brian Vancamp, Undergraduate student; Kevin Young, Undergraduate student; Joe Klosowski, Undergraduate student
Faculty Sponsor(s): Na Zhu, Engineering
Institution: University of Michigan-Flint
ORAL PRESENTATIONS A
(10:15 am - 11:15 am)

“The World of Biology”
3146 WSWB

Abstract #2
Project Title: Starvation-Induced Transgenerational Inheritance of Physiological Characteristic in C. elegans
Presenter(s): Menusha Arumugam, Undergraduate student
Faculty Sponsor(s): Steve Myers, Biology
Institution: University of Michigan-Flint

Abstract #22
Project Title: Schistosome cercariae trap
Presenter(s): Erick Hamilton, Graduate student
Faculty Sponsor(s): Jerry Sanders, Biology
Institution: University of Michigan-Flint

“Understanding Complexities through Technology”
3159 WSWB

Abstract #37
Project Title: Black Holes Get a Reality Check: Tempering how we Analyze Quasar Spectra Using Computer Simulations
Presenter(s): Paul Manion, Undergraduate student; Gavin Trevorrow, Undergraduate student; Dan Agar, Undergraduate student
Faculty Sponsor(s): Rajib Ganguly, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract #41
Project Title: Method of Lines Transpose for Hyperbolic Wave Propagation
Presenter(s): Peter Morell, Undergraduate student
Faculty Sponsor(s): Matthew Causley, Mathematics
Institution: Kettering University

Abstract #48
Project Title: A Non-Contacting DIC Technique to Obtain the Mode Shape of a Complex Structure
Presenter(s): Kiran Patil, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University
Abstract #63
Project Title: Multi-view DIC for measuring operating mode shapes of a cantilever beam
Presenter(s): Vanshaj Srivastava, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

“Automotive Design”
3201 WSWB

Abstract #6
Project Title: Strain Expansion Methodology
Presenter(s): Kedar Bharadwaj, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract #7
Project Title: KU-Tire Model for Transient Forces under Longitudinal Slip based on Relaxation Length
Presenter(s): Vikas Birajdar, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering, Jennifer Bastiaan, Mechanical Engineering
Institution: Kettering University

Abstract #12
Project Title: Measuring Dynamic Deformation of a Tire using DIC
Presenter(s): Ezra Chang, Undergraduate student; Michael Peterson, Undergraduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract #27
Project Title: Ride performance using swift based KU tire model
Presenter(s): Madhu Kandampadath, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

“Entrepreneurship and Innovation”
3202 WSWB

Abstract #13
Project Title: Google - Company Analysis
Presenter(s): Joylynn Clement, Undergraduate student; Bo Xia, Undergraduate student
Faculty Sponsor(s): Sandun Perera, School of Management
Institution: University of Michigan-Flint
Abstract #40
Project Title: Opening Smart T.V to third-party apps, user perspectives
Presenter(s): Himanandini Mohanty, Graduate student
Faculty Sponsor(s): Fadi Mohsen, Computer Science
Institution: University of Michigan-Flint

Abstract #46
Project Title: Snap Inc. Research Project
Presenter(s): Sydney Parvin, Undergraduate student; Nicholas Matthies, Undergraduate student
Faculty Sponsor(s): Sandun Perera, School of Management; Operations and Supply Chain Management
Institution: University of Michigan-Flint

Abstract #54
Project Title: Mathematically Modeling Memes
Presenter(s): Rebecca Robinson, Undergraduate student
Faculty Sponsor(s): Cameron McLeman, Mathematics
Institution: University of Michigan-Flint

“Arts and Humanity”
3203 WSWB

Abstract #15
Project Title: Swearing in Ojibwe: Do they swear, or not? A critique of Expletive Deleted: A good look at bad language, by Ruth Wajnryb
Presenter(s): Gerald Crowe, Undergraduate student
Faculty Sponsor(s): Emily Feuerherm, English
Institution: University of Michigan-Flint

Abstract #16
Project Title: Truth of Sojourner Truth
Presenter(s): Gerald Crowe, Undergraduate student
Faculty Sponsor(s): Emily Feuerherm, English; Benedicte Veillet, Philosophy
Institution: University of Michigan-Flint

Abstract #26
Project Title: Arts in Detention: HerStory Unlocked
Presenter(s): Jia Ireland, Graduate student
Faculty Sponsor(s): Shelley Spivack, Criminal Justice and Women and Gender Studies
Institution: University of Michigan-Flint

Abstract #58
Project Title: New Chapter in Dance
Presenter(s): Nicayla Shumaker, Undergraduate student
Faculty Sponsor(s): Emma Davis, Dance
POSTER PRESENTATIONS B
(11:30 am – 12:15 pm)
WSWB Atrium

Abstract #4
Project Title: Solar Water Heater
Presenter(s): Linsay Bartle, Undergraduate student; David Van Alstine, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract #47
Project Title: Design, Analysis and Optimization of Automotive Axle
Presenter(s): Vimal Bhailalbhai Patel, Graduate student
Faculty Sponsor(s): Yaomin Dong, Mechanical Engineering, Diane Peters Mechanical Engineering
Institution: Kettering University

Abstract #50
Project Title: Extraversion and College Majors
Presenter(s): Hannah Polikarpus, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #51
Project Title: Does Gender Influence Aggression?
Presenter(s): Kristen Popernek, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #52
Project Title: Durability Test Bench for Smart Tire System
Presenter(s): Arjun Srinath Raju, Graduate student
Faculty Sponsor(s): Jennifer Bastiaan, Mechanical Engineering
Institution: Kettering University

Abstract #53
Project Title: Sensitivity Analysis of the Quadrant Dichroic Mirror
Presenter(s): Joshua Ramaglia, Undergraduate student
Faculty Sponsor(s): Matthew Causley, Mathematics; Corneliu Rablau, Physics
Institution: Kettering University
Abstract #55
Project Title: The Relationship of the 5-Factor Personality Trait of Openness and Academic Self-Efficacy of a Student
Presenter(s): Joleigh Schutz, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #56
Project Title: A New Twist in the Quasar Radio Dichotomy: The Case of the Missing Outflows
Presenter(s): Viktoriah Serra, Undergraduate student
Faculty Sponsor(s): Rajib Ganguly, Physics
Institution: University of Michigan-Flint

Abstract #57
Project Title: Adaptive Cruise Control
Presenter(s): Shobit Sharma, Graduate student
Faculty Sponsor(s): Girma Tewolde, Computer Engineering; Jaerock Kwon, Computer Engineering
Institution: Kettering University

Abstract #60
Project Title: Your Openness To Experience and Self-Actualization
Presenter(s): Alyssa Smith, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #62
Project Title: Design and Development of a Robotic Salt Spreader
Presenter(s): James Soukamneuth, Undergraduate student; Charlie Sedlarik, Undergraduate student; Uriah Horton, Undergraduate student; Wesley Goodwin, Undergraduate student
Faculty Sponsor(s): Na Zhu, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract #64
Project Title: Being Thankful: The Role of Grit and Gender on Gratitude
Presenter(s): Savannah Steward, Undergraduate student; Kyle Suryan, Undergraduate student
Faculty Sponsor(s): Brian Littleton, Psychology, Phillip Nulph
Institution: Mott Community College

Abstract #65
Project Title: Using Phones and Assessment of Learning
Presenter(s): Raymond Sullivan, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College
Abstract #66
Project Title: An Investigation Into the Lack of Physical Education Curriculum In American Primary Schools
Presenter(s): India Tailor, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #67
Project Title: Are Women Really the Moody Ones? An Examination of Gender and Neuroticism
Presenter(s): Felicity Terry, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #68
Project Title: Investigating the interaction between Catechins and cellular proteins
Presenter(s): Micheal Thomas, Undergraduate student
Faculty Sponsor(s): Montserrat Rabago-Smith, Chemistry and Biochemistry

Abstract #70
Project Title: Relationship Between Age and Self Actualization
Presenter(s): Diona Wallace, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract #71
Project Title: Influence of extraction conditions on antioxidant and antimicrobial activities of Juglans Nigra (black walnut) husk extracts
Presenter(s): Elijah Ward, Undergraduate student
Faculty Sponsor(s): Michelle Ammerman, Biology; Cheryl Samaniego, Biology
Institution: Kettering University

Abstract #73
Project Title: Measuring Inflation Pressure of a Tire Using a Microphone
Presenter(s): Jonathan Wesley, Undergraduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract #76
Project Title: Robot Pentathlon (Kaiju)
Presenter(s): Shuyu Yang, Undergraduate student; Cody Cousins, Undergraduate student; Andrew Ziehm, Undergraduate student; Zihao Yan, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint
ORAL PRESENTATIONS B
(12:30 pm – 1:30 pm)

“Health and Well-Being”
3159 WSWB

Abstract #18
Project Title: How Sickness Affects Cognition: Can Being Sick More Often Lead to Cognitive Decline?
Presenter(s): Haley Dawson, Undergraduate student
Faculty Sponsor(s): Barbara Kupferschmid, Nursing
Institution: University of Michigan-Flint

Abstract #25
Project Title: Determining Discharge Location for University of Michigan Patients Based on AM-PAC 6-Click Score Results
Presenter(s): Brittany Harvey, Undergraduate student
Faculty Sponsor(s): Jennifer Blackwood, Physical Therapy
Institution: University of Michigan-Flint

Abstract #38
Project Title: Relationships, between Falls, Fractures, and Neighborhood Walkability in Community Dwelling Older Adults
Presenter(s): Jonathon Mateen, Undergraduate student
Faculty Sponsor(s): Jennifer Blackwood, Physical Therapy Department
Institution: University of Michigan-Flint

Abstract #69
Project Title: Finite Element Modeling of Skin for Vibration Analysis
Presenter(s): Rakshita Vivekananda Panchal, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

“Breakthroughs in Engineering and Design”
3201 WSWB

Abstract #9
Project Title: Enhanced Wheelchair Project
Presenter(s): Zachary Broughman, Undergraduate student; Mantas Kazhukauskas, Undergraduate student; Emerald Stanley, Undergraduate student; Luke Harrison, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint
Abstract #14
Project Title: The Robot Pentathlon (Kaiju)
Presenter(s): Cody Cousins, Undergraduate student; Zihao Yan, Undergraduate student; Shuyu Yang, Undergraduate student; Andrew Ziehm, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract #36
Project Title: Experimental Modal Test on a Model Airplane
Presenter(s): Aakash Mange, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract #42
Project Title: Human Powered Vehicle
Presenter(s): DesRae Munoz, Undergraduate student; Nolan Pytleski, Undergraduate student; Bruce Edler, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Engineering,
Institution: University of Michigan-Flint

“From Theory to Practice: An Examination of Engineering and Mathematical Models”
3202 WSWB

Abstract #31
Project Title: Finite Element Modeling and Validation of a Suspension A-arm
Presenter(s): Ashim Khadka, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract #44
Project Title: Hydraulic Press
Presenter(s): Nicholas Parks, Undergraduate student; Drew Snyder, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract #45
Project Title: Manufacturing and Testing of Advanced Composite Materials
Presenter(s): Nicholas Parks, Undergraduate student; Zachary Broughman, Undergraduate student
Faculty Sponsor(s): Olanrewaju Aluko, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint
Abstract #75
Project Title: Modern Applications of Lindenmayer Systems
Presenter(s): Justin Wisby, Undergraduate student
Faculty Sponsor(s): Cameron McLeman, Mathematics
Institution: University of Michigan-Flint

“Language, Communication, and Culture”
3203 WSWB

Abstract #59
Project Title: Mrs. Frisby and the Rats of NIMH and the “American Character”: A Perspective from Historical American Literature
Presenter(s): Arahshiel Silver, Graduate student
Faculty Sponsor(s): Jan Furman, Director, Liberal Studies
Institution: University of Michigan-Flint

Abstract #61
Project Title: Opera Outreach 2017 Teaching Artists Experience
Presenter(s): Heather Smith, Undergraduate student; Joseph Austin, Undergraduate student; Jordan Pavlica, Undergraduate student
Faculty Sponsor(s): Joshua May, Music
Institution: University of Michigan-Flint

Abstract #72
Project Title: Now it's Part of my Identity: International Student Reflections on the Bridge Program
Presenter(s): Joshua Wentz, Graduate student
Faculty Sponsor(s): Emily Feuerherm, English Department
Institution: University of Michigan-Flint
Abstract #2
Project Title: Starvation-Induced Transgenerational Inheritance of Physiological Characteristic in C. elegans
Presenter(s): Menusha Arumugam, Undergraduate student
Faculty Sponsor(s): Steve Myers, Biology
Institution: University of Michigan-Flint

Abstract: This study focused on investigating if adapted behaviors enhance endurance in harsh conditions can be inherited across generations. C. elegans (Caenorhabditis elegans) was used as a model organism to observe specific physiological characteristics after a starvation period and was compared to non-starved generation worms. Using an automated-worm tracking system and a differential interference contrast (DIC) microscope, tests on locomotory changes and rate of pharyngeal pumping was conducted in N2 wild-type strain and Sid-1 NL3221 mutant strain. In both strains, the generation of starved worms exhibited significant locomotory difference when tracked on a fed plate compared to a starved plate. However, the rate of pharyngeal pumping showed no significant difference. The data collected was inadequate to form a definitive conclusion due to inconsistency in the plates growing the worms. Ensuring a more controlled growth environment, increasing number of worms observed, and tracking changes at a different stage are some areas that need to be taken into consideration for future research.

Abstract #3
Project Title: Vehicle Dynamics Model of 2016 Kettering University Formula SAE Car
Presenter(s): Curt Bagne, Graduate student
Faculty Sponsor(s): Jennifer Bastiaan, Mechanical Engineering
Institution: Kettering University

Abstract: The Formula SAE program, henceforth referred to as FSAE, presents students with the unique challenge of designing, building, and competing with a single seat open wheel race car, all within a one year cycle. The competition is highly involved and fast paced, which makes tools, such as simulation, that can increase the efficiency of the design process invaluable. This project makes a case for the value of simulation in the context of FSAE and demonstrates the process of building and validating a model of a FSAE race car, with the result being a model of the 2016 Kettering University FSAE car. The project includes the modeling of vehicle subsystems such as tires, powertrain, and suspension. The model is validated through a kinematic analysis of the suspension and a skidpad testing to compare peak lateral acceleration between the model and the physical car.

Abstract #4
Project Title: Solar Water Heater
Presenter(s): Linsay Bartle, Undergraduate student; David Van Alstine, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: Hot water is a human necessity all over the world. In 2008, a team competing in the Design that Matters competition created a neo-natal incubator out of car parts. By designing the system from car parts, manufacturing and product costs were kept low, and serviceability was dramatically enhanced because component systems were made from parts that mechanics were already familiar with. By using
car parts to create a solar water heater, significant cost reductions will be realized in production and manufacturing, as well as increasing the size of the market by creating a product readily serviceable without specific training for servicing the product. Market analysis shows substantial opportunity for sales. A heat exchanging fluid was incorporated into the design to expand the climates the heater could be used in.

Abstract #5
Project Title: The Effect of Campus Emergency Alerts on Distance Perception
Presenter(s): Kathleen Berta, Undergraduate student; Morgan McFarlin, Undergraduate student; Jason Lawson, Undergraduate student
Faculty Sponsor(s): William McKibbin, Psychology
Institution: University of Michigan-Flint

Abstract: Previous research has shown that perception seems to be bias-prone; specifically, threat-signal priming appears to have unique effects on distance perception. The goal of this study was to determine if the perceived distance from an event could be distorted depending on whether the event is threatening or nonthreatening. We hypothesized that individuals would overestimate the distance they are away from a location when primed to think that location as threatening compared to non-threatening. We administered a short survey to a small sample (n = 64). Half of the participants received a survey beginning with a fictitious email regarding school being closed due to a nonthreatening situation (i.e. power outage), while the other half were given surveys beginning with a fictitious email alluding to campus being closed due to a threatening situation (i.e. active shooter). The results were not significant; however, it appears the estimation of distance seemed to trend in the predicted direction, and it may be supported in a future study with a larger sample.

Abstract #6
Project Title: Strain Expansion Methodology
Presenter(s): Kedar Bharadwaj, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract: Health monitoring of structures is critical in civil engineering as well as wind and civil industries. However, considering the shape and size of the structure, the difficulty in analyzing critical locations becomes challenging. Traditional sensors such strain-gages are widely used to collect data. However, the conventional methods are not capable of expanding these strain results. Hence, to bridge this gap, in this study strain mode shapes are used to generate a transformation function which can expand the limited strain data measured using strain-gauges to obtain full-field strain. To verify the accuracy of this approach, this technique was used to expand strain measured on a cantilever beam using strain gauge for sinusoidal and impact loading cases. Then, strain at a remote location on the beam was predicted and compared with the gauge monitoring that location. The correlation results show that the proposed method accurately predict strain at any location.

Abstract #7
Project Title: KU-Tire Model for Transient Forces under Longitudinal Slip based on Relaxation Length
Presenter(s): Vikas Birajdar, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering, Jennifer Bastiaan, Mechanical Engineering
Institution: Kettering University
Abstract: The accurate representation of pneumatic tire behavior is crucial for virtual simulation of vehicle performance for handling, durability, and ride analysis. Currently, an intermediate frequency (up to 120Hz) semi-analytical tire model (KU-Tire) is under development at Kettering University. A “Slip Model” needs to be added to the current KU-Tire to capture the non-linear behavior of tire and to predict accurate forces at wheel spindle during braking, accelerating, and rolling over short uneven roads. In order to model tire-road interaction mechanism, a road enveloping model is used in combination with a transient slip model. In the current study, a transient tire contact model based on the first order relaxation length concept is developed and coupled with existing KU-Tire. This “Slip Model” can accurately predict longitudinal transient slip and its dependent characteristics.

Abstract #8
Project Title: Moving Forward: The Role of Grit and Self-Regulation on Academic Progress
Presenter(s): Nickolas Bovitz, Undergraduate student; Ryan Griffiths, Undergraduate student
Faculty Sponsor(s): Brian Littleton, Psychology Dept/Fine Arts Social Science Division
Institution: Mott Community College

Abstract: This poster will present research on how grit and self-regulation relates to academic progress among community college students. Grit is defined as keeping your motivation and determination without giving up (Duckworth, Peterson, Matthews, & Kelly, 2007). Self-regulation has been defined as having self-control (Zimmerman & Labuhn, 2012). While self-control is an important factor as it pertains to a student’s willingness to continue in college, it is believed that when combined with a student’s motivation, they would be more likely to continue in school and complete more credits. Duckworth and Gross (2014) noted that “high levels of both self-control and grit may lead to greater success than either alone.” This study is an attempt to explore grit and self-regulation’s relationship to academic progress among community college students. The data presented in this study was obtained from a larger sample of collected data as part of the Psi Beta national research project. The current study analyzed 85 participants from a midwestern community college. Results of the study suggested a relationship between grit, self-regulation, and academic progress. Implications and future directions will be highlighted in the presentation.

Abstract #9
Project Title: Enhanced Wheelchair Project
Presenter(s): Zachary Broughman, Undergraduate student; Mantas Kazhukauskas, Undergraduate student; Emerald Stanley, Undergraduate student; Luke Harrison, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: For our project, we designed and tested a backpack carrier and an alternative propulsion mechanism for a wheelchair.

Abstract #10
Project Title: The Electoral College Should be Abolished
Presenter(s): Rhason Cargile, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: Your idea of a democratic Presidential election may of course be a democratic one. But has the Electoral College been a hindrance to the democratic process? It is also outdated. One of the
reasons it was created was to keep the uninformed and uneducated from voting. We live in the digital age now. To test my hypothesis, my research looked into public reaction to the 2016 Presidential Election, how the Popular Vote is weighted by State, how Electors are chosen and how they statistically vote. I conducted a literature review of peoples' feelings about the 2016 election outcome and the Electoral College, which led to protests. (Azadeh) The information I was trying to gather were the facts about how the Electoral College work how it is flawed, to present evidence that shows it does not serve the people well, and therefore should be abolished

**Abstract #11**

Project Title: Effectiveness of a Community-Based Cycling Intervention for Parkinson’s Disease on Motor Symptoms and Quality of Life  
Presenter(s): Ashley Carignan, Graduate student  
Faculty Sponsor(s): Nathaniel Miller, Psychology  
Institution: University of Michigan-Flint

**Abstract:** Parkinson’s Disease (PD) is a neurodegenerative disorder with motor and non-motor symptoms that negatively affect quality of life (QoL). Medications are primarily used to mitigate PD symptoms, but medication effectiveness is limited and wanes over time. Exercise may serve as an adjunctive intervention for PD. We examined the effectiveness of a community-based intervention for PD, Pedaling for Parkinson’s (PFP), which has PD patients ride stationary bicycles vigorously for an hour, 3X/week. We measured motor symptom severity (MDS-UPDRS) and QoL (PDQ-39) from twelve participants at baseline, 4- and 8-weeks of PFP. Significant improvements in both motor severity and QoL were found after 8 weeks of PFP. We also examined whether general activity levels (Yale Physical Activity Scale) associated with the improvements. Less generally active patients had greater improvements in QoL, but not motor severity. In sum, PFP is an effective community-based exercise intervention for mitigating motor symptoms and QoL in PD.

**Abstract #12**

Project Title: Measuring Dynamic Deformation of a Tire using DIC  
Presenter(s): Ezra Chang, Undergraduate student; Michael Peterson, Undergraduate student  
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering  
Institution: Kettering University

**Abstract:** Tires are critical components that can significantly influence the dynamics of vehicles. There are several numerical models that are used to replicate dynamics of tires for handling, ride, and NVH studies. However, these models need to be validated using experimental results. The test rigs that are able to measure deformation of a tire in a stationary environment cannot provide the true dynamics of the tires. In the current study, we have worked on a project to mount Digital Image Correlation measurement cameras on a moving vehicle to measure the deformation of a tire while the vehicle is in motion. Instead of focusing on accelerometers and strain gages, the cameras capture images and uses DIC analysis to obtain deformation of the tire in motion. The test rig is mounted to a truck to measure deformation of the front right tire. Advantages to using a system on a moving vehicle include taking into consideration many factors which a standstill environment does not include: temperature, road conditions, wheel speed on the road. This provides us with test results as close to real world data as possible.
Abstract #13
Project Title: Google - Company Analysis
Presenter(s): Joylynn Clement, Undergraduate student; Bo Xia, Undergraduate student
Faculty Sponsor(s): Sandun Perera, School of Management
Institution: University of Michigan-Flint

Abstract: The purpose of this group research project is to analyze Google’s stock value before and after the release of the Smart Speaker, Google Home. The research conducted explains how the restructuring of Google into Alphabet has allowed for the company to release competitive products, and enter new markets. The company Google is thoroughly analyzed, with the operational and organizational strategies examined and discussed. SWOT analyses were created for both the company and the selected product. The project correlates this information with the company’s decision to release the Google Home. To complete the forecasting section of the project, the process of collecting, organizing, and analyzing data was applied to Google’s stock values. Techniques of naïve, simple moving average, weighted average, exponential smoothing, and linear trend lines were used to create forecast predictions. Errors in forecasting were analyzed using the methods of MAD, MSE, and MAPE. From our research, we predict that Google will continue to grow and prosper. The company will remain competitive and innovative, driving the company’s value higher with the future developments and products that will be brought to the public.

Abstract #14
Project Title: The Robot Pentathlon (Kaiju)
Presenter(s): Cody Cousins, Undergraduate student; Zihao Yan, Undergraduate student; Shuyu Yang, Undergraduate student; Andrew Ziehm, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: Because of this past summer’s Olympic Games in Rio, Brazil, the ASME has created a competition based off the global event to test students. Engineering students from across the country have created robots to compete with each other in five different events. These events include a sprint, a climb, a lift, a throw, and a golf hit. We have created our own robot that could compete in these events following the guidelines and objectives written. Our personal goal was to engineer this robot to be able to compete and hold its own against the competition that would appear at the event. We analyzed numerous robots that competed in past event. We designed most of this robot using component parts from VeX robotics and Misumi USA in a process referred to as an assembly design. The meticulous design process of the robot strained our team and required our members to apply skill we’ve learned over the course of a roughly six month period. We call this robot the Kaiju because we hoped to create a robot that would be able to excel in the events, and because of the large task it was to engineer this robot for success.

Abstract #15
Project Title: Swearing in Ojibwe: Do they swear, or not? A critique of Expletive Deleted: A good look at bad language, by Ruth Wajnryb
Presenter(s): Gerald Crowe, Undergraduate student
Faculty Sponsor(s): Emily Feuerherm, English
Institution: University of Michigan-Flint
**Abstract:** For this presentation, I chose to object to the author, Ruth Wajnryb, who says, (basically), “Native languages swear, I know they do, but I am not going to bother to back that up.” Regarding Ojibwe, I found evidence which supports this Native American language does not contain swear words. I began this research by examining Expletive Deleted: A good look at bad language, the book used for Taboo Language, ENG 150. Wajnryb openly admits she has not studied these languages but feels comfortable stating her uninformed opinion. I dove into the literature to find out if she was right or wrong. I audited notes taken during a class presentation, and executed a formal interview with an expert in the language. I then analyzed the data through the lens of other referential sources to formulate a position against the notion Native American languages contain swear words.

**Abstract #16**
Project Title: Truth of Sojourner Truth
Presenter(s): Gerald Crowe, Undergraduate student
Faculty Sponsor(s): Emily Feuerherm, English; Benedicte Veillet, Philosophy
Institution: University of Michigan-Flint

**Abstract:** The commonly accepted speech of former slave, Sojourner Truth, given at the Women's Rights Convention in Akron, Ohio, on May 29, 1851, was published twelve years later as “Ain't I a Woman?” by Frances Dana Barker Gage, a white woman, in April 1863. Her version interjects a stereotypical dialect and verified falsehoods. While Truth was not formally educated, and admittedly could not read or write, she was noted for her skills as an orator. Truth was remembered as speaking with a clarity and conviction, which stood as a stark contrast to her former station in life as a slave: when she spoke, people listened. Gage's version is an artifact of institutional racism and should only be taught as evidence such targeted racisms exists. A better recollection was first published transcription as written by Marius Robinson, in collaboration with Truth, for The Anti-Slavery Bugle, June 21, 1851â€’ just 24 days later.

**Abstract #17**
Project Title: Assessment of Strength Deficits Following Femoral Intramedullary Rod Placement in a Twelve-Year-Old Male Athlete: A Case Report
Presenter(s): Christin Curtis, Graduate student; Molly Schab, Graduate student; Holly Tipp, Graduate student; Brittni Cruse, Graduate student
Faculty Sponsor(s): Jennifer Blackwood, Physical Therapy; Ryan Bean Physical Therapy
Institution: University of Michigan-Flint

**Abstract:** Background and Purpose: The purpose of this case report was to describe objective isokinetic strength measures used to determine readiness for return to sport following femoral intramedullary rod placement.

**Case Description:** The patient was a 12-year-old, male athlete who sustained a femoral fracture stabilized with intramedullary rod placement. At physical therapy (PT) evaluation, there were limitations in motion and strength at the knee and hip. Objective measures of quadriceps strength and a quadriceps index (QI) measured strength improvements and guided return to sport decisions.

**Outcomes:** After 8 weeks of PT, the patient’s QI improved to 87% right to left from 43% at 4 weeks; however, this value fell short of the recommended 90% used to release athletes to sport participation.
Discussion: Use of objective isokinetic measures of quadriceps strength are imperative when considering return to sport following intramedullary rod placement due to lasting quadriceps weakness associated with femoral fractures.

Abstract #18
Project Title: How sickness affects cognition: Can being sick more often lead to cognitive decline?
Presenter(s): Haley Dawson, Undergraduate student
Faculty Sponsor(s): Barbara Kupferschmid, Nursing
Institution: University of Michigan-Flint

Abstract: Rodents have been used as model organisms for human behavior, reaction to medication, and observable symptoms from treatment for decades. The way in which rodents react to repeated injections of Lipopolysaccharide produces similar effects to human sickness behavior over time. The cognitive and physical effects of sickness vary widely, and there are a variety of symptoms that affect everyday life including lethargy and loss of appetite. It is believed that repeated exposure to infections may have a negative effect on cognition over time. The mechanism of the cognitive changes induced by sickness in humans are relatively unknown. This research is meant to discover some of these effects by first using rodents as model organisms, and manipulating the tests used for rodents into reliable tests for humans. This has been suggested through the Morris Water Maze for rodents, and the Computer-Generated Arena for mice. It is important to find these mechanisms, effects, and potential interventions as repeated sickness is a worldwide problem. Understanding how it may affect humans is an integral step in understanding how to combat these illnesses, and therefore cognitive decline.

Abstract #19
Project Title: Hydraulic Press
Presenter(s): Chad Fares, Undergraduate student; Drew Snyder, Undergraduate student; Raed Abuaita, Undergraduate student; Nicholas Parks, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: This project was inspired by the need for a hydraulic press that could improve the capabilities of the U of M-Flint machine shop by incorporating a double acting hydraulic assembly that is capable of utilizing different tools to perform several operations. The U of M-Flint machine shop was willing to donate a tank, pump, motor, and valve assembly that was not currently in use to aid in this project. With the given parts we were able to get within reason of our given budget; without this contribution we wouldn't be able to afford building this press.

Abstract #20
Project Title: History through Art
Presenter(s): Melissa Foether, Undergraduate student
Faculty Sponsor(s): Jenna Andrews, Art; Brian Littleton, Psychology
Institution: Mott Community College

Abstract: My project is called Art through History; it was my final for a Humanities course called "The Art of Being Human" taught by Dr. Aequitas at Schoolcraft College. I want to turn it into a Billboard presentation. By selecting artwork at the Detroit Institute of Art from different periods of time I am looking to see how art has changed through the genres. By looking through the eyes of my applied understanding of historical and social context, the intertwined tale behind the muse. That sounded like
an exciting adventure to me and it surely was, as I was to learn how deeply society affects art at the same time the art is affecting society. It is all very subjective and objective, which almost seems to be an offensive or defensive reaction to society. The project became larger than I expected, but through it I came to understand 500 years of philosophy, religion, and society in a way I could not have imagined, through art.

Abstract #21
Project Title: Schizophrenia: Case Study
Presenter(s): Morgan Goodman, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: My presentation is a case study analysis on a client who shows symptoms of Schizophrenia. My poster will include five different sections. The first section will be a summary overview of the case study. The next section will be a section for discussion. This section will include information about the client and a brief summary of symptom history to now. The following section will be an assigned diagnoses, where the diagnoses is explained and examples given to support how the client fits the criteria for the diagnoses. The fourth section will be for environment and psychosocial functioning. In this section I will give examples of possible factors in the clients environment that could contribute to their symptoms. The very last section will be a treatment plan. This section will include a short-term goal, long-term goal, and treatment modality for a possible treatment plan for the client.

Abstract #22
Project Title: Schistosome cercariae trap
Presenter(s): Erick Hamilton, Graduate student
Faculty Sponsor(s): Jerry Sanders, Biology
Institution: University of Michigan-Flint

Abstract: Although cercariae traps have been successfully developed to catch schistosome cercariae in natural waterways, reliable testing stations have yet to be developed to make testing easy and cost effective. We have adapted common hardware store items to make an inexpensive and easy to build cercariae test station. By rethinking how the Traps are to be held we have come up with a stations that can test for any cercariae type in virtually any type of waterway. This versatile and easily modifiable plan has the potential for identifying important areas to be treated, thus limiting exposure to cercariae and disease transmission.

Abstract #23
Project Title: Gender Null Effects on Affect after Receiving Compliment
Presenter(s): Andi Hammond-Chaffin, Undergraduate student; Rachel Murley, Undergraduate student; Devin Willis, Undergraduate student; Jordan Inman, Undergraduate student
Faculty Sponsor(s): Terrence Horgan, Psychology
Institution: University of Michigan-Flint

Abstract: Are there gender differences in affect after receiving a compliment? It has been shown that men and women may give each gender different types of compliments, but the present study looks at how each gender responds to different types of compliments. It was predicted that men would have a higher positive affect in response to an impersonal compliment, whereas women would have a higher positive affect in response to a personal compliment. Participants went through a brief interview about their schooling during which they were given either an impersonal or personal compliment and then
they filled out a personality questionnaire consisting of the PANAS (Positive and Negative Affect Scale) and distractor items. There was no significant difference in positive affect across genders or conditions. There was no interaction between gender and condition. The implications of these findings are discussed.

Abstract #24
Project Title: Do practices quizzes relate to better exam scores?
Presenter(s): Miranda Hanson, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: In this study, the researcher will determine the strength of the relationship between students completing at least one practice quiz and their exam scores. Many previous research has shown that distributed study does in fact improve the comprehension of material that will later be retrieved. In participating in practice quizzes, it allows students to revisit information that was previously learned in class. The data that was collected is from five sections of introductory psychology courses with a total of 130 students participating at a community college in Flint, Michigan. This data supports a significantly strong relationship between utilizing practice quizzes and exam performance.

Abstract #25
Project Title: Determining Discharge Location for University of Michigan Patients Based on AM-PAC 6-Click Score Results
Presenter(s): Brittany Harvey, Undergraduate student
Faculty Sponsor(s): Jennifer Blackwood, Physical Therapy
Institution: University of Michigan-Flint

Abstract: Background: The Activity Measure for Post Acute Care (AM-PAC) was developed to determine activity limitations in the acute care setting. The AM-PAC 6-Click was created as a shorter and easier way to assess patients’ mobility, by asking them to perform six mobility related functions and scoring ranges from full dependence to independence with the activities. Past studies have reported that results on the AM-PAC 6-Click have been able to help predict discharge location of patients from an acute care hospital but these scores have not been determined by diagnostic group.

Objectives: This study will determine the ability of the AM-PAC 6-Click scores to predict discharge location, across varying diagnoses from an acute care hospital stay.

Methods: Medical record data from over 13,000 patients who were hospitalized between June 2016 and March 2017 will be obtained from The University of Michigan Health System. AM-PAC 6-Click scores will be examined by admitting diagnosis to determine the accuracy of the AM-PAC 6-Click to predict patients discharge location from an acute care hospital stay. Relationships between 6-Click scores at admission and discharge and other measures of mobility, length of stay, and level of frailty will be completed.

Abstract #26
Project Title: Arts in Detention: HerStory Unlocked
Presenter(s): Jia Ireland, Graduate student
Faculty Sponsor(s): Shelley Spivack, Criminal Justice and Women and Gender Studies
Institution: University of Michigan-Flint
**Abstract:** The Buckham/GVRC Share Art Project is a collaboration between GVRC (Gensee County’s youth detention center) and Buckham Gallery that examines alternative methods of juvenile rehabilitation in a detention center. The Project introduces artistic concepts and techniques to youth as a means of creative self-expression as well as a vehicle for self-exploration, social skill building, and positive peer interaction. The project offers workshops three times per week focusing on visual art, Spoken Word poetry, theatre, and dance. The Project showcases the artwork created by the youth in an annual Arts in Detention exhibit at Buckham Gallery and in an exhibit at GVRC curated by the youth. A unique aspect of the program is The HerStory: Unlocked workshops that address the unmet needs of girls at GVRC through poetry, theatre and dance. HerStory Unlocked also seeks to involve the community with the rehabilitation and re-acclamation of girls in detention through a series of community dialogues. The Project also publishes an annual collection of the girls’ writings. In my presentation I will present videos and photos I took to document the work of the Project as well as examples of poetry written by the youth and excerpts of the community dialogues.

**Abstract #27**
Project Title: Ride performance using swift based KU tire model
Presenter(s): Madhu Kandampadath, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

**Abstract:** The vehicle ride performance depends on the dynamic interaction of various components of the vehicle structure, in which tires forces play a very major role. Analytically deriving axle forces and moments due to tire rolling over an arbitrary surface is a major challenge for the ride performance engineers. The tire’s ability to absorb and dampen the road roughness and transmitting forces to the wheel spindle is a distinct measure of tire ride performance. That calls a need for developing tire model that can accurately predict the vertical forces on the axle when tire rolls over arbitrary surface. A two-dimensional five degree of freedom semi-empirical tire model is developed at Kettering University. Rolling over obstacles in a road is computed by effective road enveloping model and the tire model uses processed road surface as an input. This coupled tire model effectively predicts dynamic responses at the axle. The rigid ring model representing tire is modeled on an elastic foundation representing tire belt connecting axle. The model is very computationally efficient and can accurately calculate the dynamic responses for excitations at frequencies below 120Hz. The tire model can be coupled to multi-body software packages for improved full vehicle ride performance analysis.

**Abstract #28**
Project Title: A Secondary Analysis of the Behavioral Impacts of Policy and Community Education on Proper Child Car Seat Usage
Presenter(s): Deepika Kandasamy, Graduate student
Faculty Sponsor(s): Rie Suzuki, Public Health and Health Sciences; Michelle Macy, School of Medicine - University of Michigan - Ann Arbor
Institution: University of Michigan - Flint

**Abstract:** In the United States, motor vehicles crashes (MVCs) are one of the leading causes of injury and fatality for children between the ages of 1 and 14. Proper child restraint use may help decrease the prevalence of these negative outcomes. In 2011, the American Academy of Pediatrics released new, more stringent, recommendations for proper child passenger safety practices based on child size. The purpose of this study is to compare the impacts of community education efforts (i.e. car seat checks) on child passenger safety behaviors before and after this policy change. A secondary analysis was
performed on 25,214 car seat inspection forms attained from Safe Kids Michigan for 2010 through 2014. Child height and weight measurements were utilized to determine whether children were arriving and departing the car seat events in the correct restraint for their size. The use of size-appropriate child restraints upon departure from car seat events was then considered with regards to pre-policy and post-policy periods. Understanding the interplay between policy and community education may allow for more effective implementation of both techniques in order to decrease MVC-related injury and fatality among children.

Abstract #29
Project Title: PTSD and Firefighting Operations.
Presenter(s): Jack Kelley, Undergraduate student
Faculty Sponsor(s): Brian Littleton, Psychology
Institution: Mott Community College

Abstract: Stress from firefighting operations is a given hazard. Often Firefighters must respond to a call that shows humanity at its worst. Unchecked, this stress can lead to severe PTSD and can debilitate a Firefighter and even weaken an entire departments fireground operations. Post-Traumatic Stress Disorder, PTSD, is a serious mental disorder that develops after a person experiences a life-threatening, traumatic event. Symptoms often include severe depression and anxiety issues, months and even years after the event. Many who suffer PTSD often find themselves relieving the traumatic event while remembering it. The purpose of this research study will attempt to identify PTSD triggers and ways to manage the resulting symptoms. The findings of this study could be used to increase firefighter safety and health.

Abstract #30
Project Title: Is Happiness Related to GRIT
Presenter(s): Janine Keyes, Undergraduate student; Megan McGee, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology; Brian Littleton, Psychology
Institution: Mott Community College

Abstract: This study examines how happiness influences GRIT in student life. Grit is the perseverance and passion a person has for their goals and very little research has been done to show how this is effected by a person’s happiness. In looking at these variables it is shown that the happier a student is the more motivation they will have to perform well in school. These variables are important to look at because many students push themselves too far in order to do well in school and do not take care of themselves or even their mental health. I have conducted this research in hopes of helping others see that they need to help themselves first or their perseverance may falter.

Abstract #31
Project Title: Finite Element Modeling and Validation of a Suspension A-arm
Presenter(s): Ashim Khadka, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract: Components of suspension systems are subjected to dynamic loading that varies based on road surfaces. These components are prone to fatigue and fracture failures. Therefore, it is desirable to develop validated finite element models of suspension components that can be used for durability analysis. In the current paper, a finite element (FE) model of an A-arm is developed and validated using
experimental modal analysis. The FE model was developed using parabolic tetrahedral elements. An Eigen solution was performed on the finite element model to extract natural frequencies and mode shapes of the A-arm. An experimental modal test is also performed on the A-arm using impact hammer modal test to obtain its resonant frequencies and mode shapes. The A-arm was excited at 30 selected measurement points using an impact hammer and the responses of the structure to the excitations were measured using two triaxial accelerometers. The finite element results were correlated to the experimental results using the Modal Assurance Criterion (MAC) for validation purposes. The finite element model was modified to improve the correlation results. This model can be used for developing novel approaches for durability analysis.

Abstract #32
Project Title: Is Conscientiousness Related to GPA
Presenter(s): Hannah Livingston, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: This study investigates how TIPI conscientiousness scores are related to academic success. As the conscientiousness score increases, the student’s overall GPA will increase. When someone scores high in conscientiousness, they are organized and hardworking. Which may make them more dedicated to school and their grades than their peers. There have been several other studies examining the relationship between these two variables, proving them to have a positive relationship, which will be discussed later in the study. The results from my own correlation study will also be discussed.

Abstract #33
Project Title: Characterization of Co-Digestion of Pickle Waste and Primary Sewage Sludge in Single-Stage and Two-Stage Anaerobic Digestion Processes
Presenter(s): Taylor Lowe, Undergraduate student
Faculty Sponsor(s): Michelle Ammerman, Biology
Institution: Kettering University

Abstract: Michigan is the leading producer of pickling cucumbers and consequently produces a large amount of organic waste. Anaerobic digestion of pickle waste provides a sustainable alternative to landfilling and could reduce both costs and CO2 emissions. This project sought to determine the utility of pickle waste as a supplemental feedstock in anaerobic co-digestion with primary sewage sludge and the optimal conditions for bio-methane production comparing single- and two-stage anaerobic digestion processes. Four anaerobic digester reactors were assembled. Reactors 1 and 2 were setup to model a two-stage anaerobic digester. Reactor 3 models a one-step reaction process. Reactor 4 is a control one-stage digester containing the primary sewage sludge without pickle materials. Results from these studies will be used to understand the effects of pickle waste on gas production, reactor health and stability, and can be used by full scale plant operators to determine the loading capacity.

Abstract #34
Project Title: Studying Correlation Between Age and Self-Actualization
Presenter(s): Jilian Lueker, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College
Abstract: A study was done to show the correlation between age and self-actualization. The sample was taken from community college students from age eighteen on. It was predicted that the group with higher self-actualization scores would be older than twenty-five. Results indicate there is not a significant difference between the groups tested, t(0.98) =0.64 and p=0.522.

Abstract #35
Project Title: The Effects of Third-Hand Smoke on Children
Presenter(s): Spencer MacLeod, Undergraduate student
Faculty Sponsor(s): Mark Valacak, Public Health & Health Sciences
Institution: University of Michigan-Flint

Abstract: If second-smoke is a silent killer, he other silent killer would be third-hand smoke. Children are at risk of developing health conditions in their future through the exposure to third-hand smoke, which is the settling residue of second-hand smoke. This project examines the effects third-hand smoke has on children.

Abstract #36
Project Title: Experimental Modal Test on a Model Airplane
Presenter(s): Aakash Mange, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract: The vibrations of airplane components play a major role in fatigue failures of these structures. The resonant frequencies and mode shapes of an airplane can show the critical components and can be used to improve the structural durability. This work studies the vibration characteristics of a 1/32 scaled model of the fighter plane Northrop Alpha. This study can be extended to real full-scaled airplanes. An experimental modal analysis was performed on the airplane using a modal impact hammer. The airplane is excited at 52 points with a hard plastic tip. Two accelerometers are used to measure the response of the structure to the excitations. The time domain responses of the impacts are transformed to the frequency domain to obtain the natural frequencies, damping and mode shapes of the airplane. By curve-fitting the results, the first six mode shapes of the airplane were extracted and validated using Modal Assurance Criterion.

Abstract #37
Project Title: Black Holes Get a Reality Check: Tempering how we Analyze Quasar Spectra Using Computer Simulations
Presenter(s): Paul Manion, Undergraduate student; Gavin Trevorrow, Undergraduate student; Dan Agar, Undergraduate student
Faculty Sponsor(s): Rajib Ganguly, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: Quasars are supermassive black holes at the heart of galaxies are accretinggas in the form of a disk. During accretion, the infalling material becomes extremely hot and therefore radiates light across the spectrum. In the observed spectra, we often detect gas outflowing from the system silhouetted against the luminous disk. The physics and geometry of gas is of interest here. In particular, we are interested in our ability to use the observed spectra to infer the sizes of these gas “clouds” and other physical parameters. We use simulations to examine what the implied geometric coverage of the quasar disk and compare it to that implied by the spectra. We use the same
simulation to see what physical parameters, such as number of clouds and varying density of the clouds, to see what properties most affect the calculations of geometric coverage and consider the accuracy of inferring the geometry from the spectra.

Abstract #38
Project Title: Relationships, between Falls, Fractures, and Neighborhood Walkability in Community Dwelling Older Adults
Presenter(s): Jonathan Mateen, Undergraduate student
Faculty Sponsor(s): Jennifer Blackwood, Physical Therapy Department
Institution: University of Michigan-Flint

Abstract: Background: In older adults, those age 65 and over, falls and fall related injuries are a major concern. Engagement in life space beyond the home has been reported to influence mobility and may contribute to falls incidence. Genesee County faces problems within the environmental accessibility or walkability of neighborhoods, which can lead to decreased physical activity, increased incidence of falls, and shape perceptions on neighborhood walkability.

Purpose: This study seeks to understand the relationships between falls, fractures and neighborhood walkability in community dwelling older adults.

Methods: Older adults, 65 years of age and older, residing in and around Flint, MI were surveyed and data on falls incidence and severity, balance, mobility and perceived neighborhood walkability was collected. Correlation analyses were performed to examine relationships between constructs of neighborhood walkability, falls, and fall related injuries.

Discussion: Results from this study will provide information to guide the creation of new and facilitate changes to existing falls prevention programs and help guide policy for urban redevelopment to consider neighborhood design which promotes physical activity.

Abstract #39
Project Title: Siblings and Personality Development
Presenter(s): Manon McCullough, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: Siblings play a significant role in one’s life. A study was conducted to investigate the relationship between the number of siblings on openness and agreeableness personality traits. Openness entails how independent and imaginative one is. Agreeableness entails how trusting and helpful an individual is. One hundred and eight students were surveyed on how many siblings they had and completed the Ten Item Personality Inventory (TIPI). It was found that number of siblings has no correlation with openness, r(106) = -.10, p = .30, but has a moderate, negative correlation with agreeableness, r(106) = -.23, p = .016. Results indicate that the more siblings one has, the less agreeable they are.
Abstract #40
Project Title: Opening Smart T.V to third-party apps, user perspectives
Presenter(s): Himanandini Mohanty, Graduate student
Faculty Sponsor(s): Fadi Mohsen, Computer Science
Institution: University of Michigan-Flint

Abstract: A third-party app is any app that is developed by a party other than the device/platform vendor. For instance, in a Google mobile phone that runs Android OS, any app that is not developed by Google is considered a third-party. Third-party apps are usually developed by an individual or a known company. For example, Google Maps app that is running on a Microsoft mobile device is considered a third-party app of a known company. Unlike smart phones, smart TV vendors have strict policy about allowing third party applications into their platforms. To the best of our knowledge, all smart TV vendors do not allow individual third party apps into their platforms. In this paper, we are investigating user’s opinion on opening smart TV platforms for third-party applications by individuals the same way smart phones are. In doing so, we are conducting an online questionnaire of 50 participants to answer the above question besides we study users’ privacy assumptions about smart phones and smart TVs. Our analysis shows that the majority of the participants are with opening the platforms for third-party applications.

Abstract #41
Project Title: Method of Lines Transpose for hyperbolic wave propagation
Presenter(s): Peter Morell, Undergraduate student
Faculty Sponsor(s): Matthew Causley, Mathematics
Institution: Kettering University

Abstract: We develop a novel algorithm for wave propagation, based on a modification of finite difference methods. The new scheme is unconditionally stable, and can be raised to high orders of accuracy, permitting large time steps while resolving fine spatial features. We demonstrate this approach in 1 and 2 spatial dimensions, and examine a nonlinear wave problem.

Abstract #42
Project Title: Human Powered Vehicle
Presenter(s): DesRae Munoz, Undergraduate student; Nolan Pytleski, Undergraduate student; Bruce Edler, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Engineering
Institution: University of Michigan-Flint

Abstract: We engineered a human powered vehicle for our senior exit project in the Mechanical engineering department. We initial wanted to attend the ASME competition, however due to other circumstances we were not able to attend. We tested the project followed by ASME requirements of break testing, turning testing and stability. In the end we created a remarkable human powered vehicle, thanks to the engineering department and the faculty.
Abstract #43
Project Title: X-Y ShakerTable
Presenter(s): Corynn ODea, Undergraduate student; Brian Vancamp, Undergraduate student; Kevin Young, Undergraduate student; Joe Klosowski, Undergraduate student
Faculty Sponsor(s): Na Zhu, Engineering
Institution: University of Michigan-Flint

Abstract: The engineering and physics department has needed a vibration table for some time. Staff have investigated the feasibility of purchasing a vibration table, also known as shaker table, yet they range in cost from $1,000-$4,000. Therefore, it is beneficial to design a more affordable vibration testing table, using the resources we have in the machine shop. This vibration testing table will give future students an opportunity to test their prototype, to test their finalized designs, or even to create works of art. Many courses can benefit from this such as machine design, senior design, vibrations, and of course physics courses. There is also a need for art courses to refine the finish of their epoxy projects. Epoxy needs to be shaken very steadily in order to allow the bubbles to rise to the surface. Doing this manually can be difficult and inconsistent. The vibration table will allow them to adjust the frequency to the appropriate amount of vibration in order to achieve the cleanest epoxy finish. The vibration testing table will have many features such as a four piece railing system in X and Y axis, DC linear motors, custom mounting features that will hold testing fixtures, and an interactive interface driven by an Arduino.

Abstract #44
Project Title: Hydraulic Press
Presenter(s): Nicholas Parks, Undergraduate student; Drew Snyder, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: This project was inspired by the need for a hydraulic press that could improve the capabilities of the U of M-Flint machine shop by incorporating a double acting hydraulic assembly that is capable of utilizing different tools to perform several operations. The U of M-Flint machine shop was willing to donate a tank, pump, motor, and valve assembly that was not currently in use to aid in this project. With the given parts we were able to get within reason of our given budget; without this contribution we wouldn't be able to afford building this press.

Abstract #45
Project Title: Manufacturing and Testing of Advanced Composite Materials
Presenter(s): Nicholas Parks, Undergraduate student; Zachary Broughman, Undergraduate student
Faculty Sponsor(s): Olanrewaju Aluko, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: Rapid prototyping was utilized to create 3-D printed test samples. These samples were used to produce a mold that allows for high volume sample production. A high shear mixer was used to add small quantities of graphene to an epoxy resin and then poured into molds. Once cured, test samples of varying graphene amounts were tested at multiple strain rates.
Abstract #46
Project Title: Snap Inc. Research Project
Presenter(s): Sydney Parvin, Undergraduate student; Nicholas Matthies, Undergraduate student
Faculty Sponsor(s): Sandun Perera, School of Management; Operations and Supply Chain Management
Institution: University of Michigan-Flint

Abstract: Our group did research on the camera company, Snap, and in particular the implications of its decision to go public. Snap Inc. is mostly known for its mobile application, Snapchat; however, our research has indicated that the company will grow and diversify its products beyond mobile software, as it ventures into hardware products as well. Our project looks at the various strengths, weaknesses, opportunities, and threats of the company, and how these features will play a role in its future as a publicly traded company. Our project also examines the company’s strategy to grow and diversify, and how its decision to do an IPO coordinates with its organizational and operational practices. Our project also utilizes various forecasting methods to project the future revenue of the firm, such as Naive, Moving Average, Weighted Moving Average, Exponential Smoothing and Techniques for Trend. Overall, we predict the future of Snap based on our research of the firm, the tech industry, and similar companies that have gone public.

Abstract #47
Project Title: Design, Analysis and Optimization of Automotive Axle
Presenter(s): Vimal Bhailalbhai Patel, Graduate student
Faculty Sponsor(s): Yaomin Dong, Mechanical Engineering, Diane Peters Mechanical Engineering
Institution: Kettering University

Abstract: The Automobile industry is one of the most important and key sectors of the Michigan, USA. The demands on automobile designers have been increasing rapidly for many years and it will continue to remain the same in the future. One of the demands is to meet system safety requirements and to reduce the overall weight of the vehicle and its components to satisfy fuel economy and vehicle performance needs. In some passenger car and heavy commercial vehicle applications, rear axle carries the weight of rear part (from the CG point to the rear of the vehicle) of that particular type of vehicle. And in some cases, front axle carries the weight of front part of the vehicle, and also facilitates steering and absorbs shocks due to road surface variation. The front and rear axles are designed to transmit the weight of the automobile from the front and rear suspension and springs on to themselves. Therefore, proper design of front and rear axles is very crucial. This research work deals with the design, analysis and optimization of dead axle (which in case of FWD vehicles is rear axle and RWD vehicles is the front axle). This work is divided into two parts. In the first part, the analysis of the dead axle will be carried out with commonly used material like SAE grade 41xx steel or SAE grade 10xx steel. And in the second part, the same axle will be optimized. Gross weight, payload capacity and braking torque values of the vehicles are used during analysis. Modelling of dead axle will be carried out in the NX 11.0 software and Analysis & Optimization of the same dead axle will be carried out in the NX NASTRAN software.

Abstract #48
Project Title: A Non-Contacting DIC Technique to Obtain the Mode Shape of a Complex Structure
Presenter(s): Kiran Patil, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University
Abstract: The conventional experimental modal analysis approach does not provide full field information about the structure and may induce mass loading effects. Digital Image Correlation is a non-contacting technique that is recently used to obtain the dynamics of structures. This technique does not induce any mass loading effects and can provide full-field result over the visible area of the structure. However, a stereo camera system may have line of sights only on certain parts of a complex structure. Hence, to obtain the dynamics of a complex structure, multiple cameras need to be used which may be extremely expensive. For semi-static measurements, a single stereo camera may be moved around the entire structure. However, this technique cannot be applied for a dynamic measurement because the response is transient and the deformation of the structure may change when the camera system moves. In this study, a technique is proposed that can be used to stitch captured views during a dynamic measurement. The technique works based on stitching the views in the frequency domain rather than the time domain. The proposed technique uses a uniform scaling factor that facilitates the stitching of the obtained mode shapes by roving of cameras around the structure.

Abstract #50
Project Title: Extraversion and College Majors
Presenter(s): Hannah Polikarpus, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: This study explored the relationship between a person’s level of extraversion, and their college major or career selection. The hypothesis was that people in the fine arts field would be less extraverted, and that people in the business field would be more extraverted. Participants were advanced psychology students at a community college. The students were asked to fill out the Ten-Item Personality Inventory, and to specify which major they intended to pursue. The results show there is no significant relationship between extraversion score and reported majors, F(3,88) = .33, p = .80.

Abstract #51
Project Title: Does Gender Influence Aggression?
Presenter(s): Kristen Popernek, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: This presentation investigates aggression and gender. It is important for society to understand that gender has no influence on aggression. Specifically it is predicted that males would score higher than females on a measure of aggression. In the study Aggression was measured using the HCTI (Horney - Coolidge Type Indicator). Results indicate no significant difference. t (143) = -1.46, p=.146.

Abstract #52
Project Title: Durability Test Bench for Smart Tire System
Presenter(s): Arjun Srinath Raju, Graduate student
Faculty Sponsor(s): Jennifer Bastiaan, Mechanical Engineering
Institution: Kettering University

Abstract: The purpose of the durability test bench is to read strain measurements on tire samples, with the ultimate goal of estimating tire forces. Since vehicle motion is strongly affected by the lateral and longitudinal forces acting on tires, a setup which can measure these parameters in a durable and inexpensive manner, can help provide an understanding of vehicle behavior in varying driver and
environmental conditions. A simple test bench was built that emulates the compressive forces on tire sidewalls, and piezoelectric sensors were installed to measure the strain values through waveforms obtained by a signal analyzer. The future task is to attach the sensors to tire samples with appropriate adhesives, subject the samples to compressive forces on the test bench and read the measurements over thousands of cycles, to confirm sufficient durability in the sensors. This data would then be fed into a vehicle’s control system as part of a “Smart Tire System” to indicate the tire’s behavior, particularly displaying warnings in dangerous tire and road conditions that are difficult to perceive by the driver.

Abstract #53
Project Title: Sensitivity Analysis of the Quadrant Dichroic Mirror
Presenter(s): Joshua Ramaglia, Undergraduate student
Faculty Sponsor(s): Matthew Causley, Mathematics; Corneliu Rablau, Physics
Institution: Kettering University

Abstract: Quadrant dichroic mirror (QDM) position sensors are proposed as an alternative to quadrant photodiode (QPD) sensors for the alignment of sensitive instruments. The sensor is calibrated by converting wavelengths of reflected light into output voltages. We present a sensitivity analysis for this calibration technique.

Abstract #54
Project Title: Mathematically Modeling Memes
Presenter(s): Rebecca Robinson, Undergraduate student
Faculty Sponsor(s): Cameron McLeman, Mathematics
Institution: University of Michigan-Flint

Abstract: With the rising use and popularity of the Internet, it is much easier to spread content from person to person. Content in the form of humorous images known as memes is often shared among peers. We aim to model the rise and fall of Internet memes by using methods normally used to model infectious diseases. By working with a Markov chain, we create a function that models the spread of a meme. With this, we hope to predict future trends in Internet culture.

Abstract #55
Project Title: The Relationship of the 5-Factor Personality Trait of Openness and Academic Self-Efficacy of a Student
Presenter(s): Joleigh Schutz, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: In this study we look at the Big Five Factor personality traits and one of it’s specific traits, Openness, and its effect on the academic self-efficacy of a college student. The hypothesis was that these two would strongly correlate because when an individual is open to new ideas, they will often take any effective means to complete their goals generally, and it seems realistically applicable to academics. Openness was defined here as a willingness to experience new things and take in new ideas, while self-efficacy was defined as an individual's belief that they can successfully achieve at attained an academic goal. The course instructor administered the measures during semesters taking place from September 2015 to December 2016. Scaling Openness was done with the Ten-item Personality Inventory (TIPI), while self-efficacy was measured by a scale of stress on various academic activities
(Zajacova 2005). Measures were collected, scored, and the data entered into a Microsoft Excel protected worksheet, and a significant positive correlation of .23 was found between Openness and Self-Efficacy. From this evidence of correlation, we can conclude that an the higher an individual’s degree of openness, the more self-confident and willing they are to complete their academic goals.

Abstract #56
Project Title: A New Twist in the Quasar Radio Dichotomy: The Case of the Missing Outflows
Presenter(s): Viktoriah Serra, Undergraduate student
Faculty Sponsor(s): Rajib Ganguly, Physics
Institution: University of Michigan-Flint

Abstract: A previous study of mass outflows from growing black holes ("quasars") observed with the Cosmic Origins Spectrograph onboard the Hubble Space Telescope revealed questions about the bias either with regard to the orientation of the systems, or of something physically different between systems that shine in the radio band ("radio-loud") and those that don't ("radio-quiet"). Of the one-hundred and forty-six radio-quiet quasars observed, thirty-nine showed the outflow in ultraviolet absorption by the N(4+) ion. Comparatively, of the nineteen radio-loud quasars that were observed, none showed N(4+) absorption. We hypothesize that the sample of radio-loud quasars is biased in orientation such that we do not see the outflows, rather than there being a physical difference. Nearly all of the radio-loud quasars are observed in a particular orientation. To further test this hypothesis, we are observing a sample of 11 radio-loud quasars with a variety of orientations. We present the results of our new Hubble Space Telescope observations thus far, along with the orientations of the objects and a possible solution to this mystery.

Abstract #57
Project Title: Adaptive Cruise Control
Presenter(s): Shobit Sharma, Graduate student
Faculty Sponsor(s): Girma Tewolde, Computer Engineering; Jaerock Kwon, Computer Engineering
Institution: Kettering University

Abstract: The purpose of this poster is to demonstrate the various technologies used in an autonomous vehicle prototype. We use a LIDAR sensor, fish eye camera, ultrasonic sensors, and tachometers to develop a prototype of a self-driving vehicle. One of the first steps towards autonomous driving is the ability of the vehicle to monitor and control its speed by taking into consideration the external conditions surrounding the vehicle and the user’s intent. This is an extension to the conventional cruise control by incorporating feedback mechanisms to adjust the vehicle speed as per varying road conditions. This is known as Adaptive Cruise Control. To implement this, a LIDAR sensor works in conjunction with a tachometer for distance and speed measurement respectively. The software for this is developed in python using multithreading to read both sensors simultaneously and in real time. The next crucial thing is the ability to detect obstacles: other cars, pedestrians, road signs and stop signs. For the detection of road signs, a machine learning approach using haar-cascades will be employed. Although this approach takes a lot of work during the build phase, once ready it is very reliable and fast as compared to the conventional techniques employed for object identification. For instance, if the object of interest is a stop sign, a lot of positive and negative sample images are required to train the cascade classifier to detect the stop sign. Once the training is done, this training file can be utilized in any program to detect the object of interest. Such an approach not only identifies the object, it also helps in detecting its coordinates in a 2-dimensional plane. This technology could be extended to detect traffic lights, pedestrians, cyclists, and other vehicles as well.
Abstract #58
Project Title: New Chapter in Dance
Presenter(s): Nicayla Shumaker, Undergraduate student
Faculty Sponsor(s): Emma Davis, Dance
Institution: University of Michigan-Flint

Abstract: My performance is a dance that focuses on a recent decision that I made as a dancer. I am no longer going to be competing in dance, but instead just focusing on the growth and technique of being a dancer. The beginning of my dance will be a poem my parents wrote about dance and what it has done for me. Then I also will finish my dance to a song that relates to my decision. This is also a dance that I am turning in as a final for a choreography place.

Abstract #59
Project Title: Mrs. Frisby and the Rats of NIMH and the “American Character”: A Perspective from Historical American Literature
Presenter(s): Arahshiel Silver, Graduate student
Faculty Sponsor(s): Jan Furman, Director, Liberal Studies
Institution: University of Michigan-Flint

Abstract: The Newbery Award-winning book, Mrs. Frisby and the Rats of NIMH, is not only an example of sophisticated and high-quality “children's literature,” but, under scrutiny also reveals itself to be an exhibition of one part of the very essence of American character. Through careful analysis of some of its core messages against the backdrop of American literature, one notes that these concepts, put forth in print in 1971, have been historically examined by a range of authors--from the philosophically-minded, such as Ralph Waldo Emerson, to the sociologically-minded, such as W.E.B. Du Bois. The ideation of untempered technological dependency and development has inspired many American thinkers to advise caution and suggest consideration of these proclivities and their risk to the development and maintenance of a robust, thoughtful, and flexible civilization.

Abstract #60
Project Title: Your Openness To Experience and Self-Actualization
Presenter(s): Alyssa Smith, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: Research has done looking the relationship between Openness to Experience and Self-Actualization scores. The hypothesis is that the two variables will positively correlate; if one’s openness score is high, than their self-actualization score would be high, too. As for the sample size, there were 99 participants that all were students enrolled into an advanced psychology class at Mott Community College through many years. Over these years, students have taken the TIPI (Ten-Item Personality Inventory) and the Self-Actualization assessment. After taking these tests, the data was recorded by the instructor. This was done by having the participants write them on a personal record sheet and turned their sheet into the instructor. In conclusion, the results showed a correlation coefficient of .293 which means there is a positive relationship between the two variables. Now, this is a good thing- if one goes out and experiences the things life has to offer, they will become more aware of themselves as well as interest and needs they have. Two implications of the results is that these are protective tests therefore results may not be 100% accurate. The second is that this is generalized to one course at a single college.
Abstract #61
Project Title: Opera Outreach 2017 Teaching Artists Experience
Presenter(s): Heather Smith, Undergraduate student; Joseph Austin, Undergraduate student; Jordan Pavlica, Undergraduate student
Faculty Sponsor(s): Joshua May, Music
Institution: University of Michigan-Flint

Abstract: The Opera Outreach 2017 Teaching Artist program was developed to complement the performance program in our music department. As teaching artists, we develop lesson plans for K-2 and 3-5 grade levels that bring music education experiences to different schools and performance venues throughout our region. In addition, we developed our own sensory friendly lesson plans this year to provide a new opportunity for students to experience the world of opera. We will present and discuss our experiences of bringing our lesson plans from creation to implementation in the classroom as part of this project.

Abstract #62
Project Title: Design and Development of a Robotic Salt Spreader
Presenter(s): James Soukamneuth, Undergraduate student; Charlie Sedlarik, Undergraduate student; Uriah Horton, Undergraduate student; Wesley Goodwin, Undergraduate student
Faculty Sponsor(s): Na Zhu, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: The design of a robot to improve the quality of life of all who are affected by winter. The design is to integrate an Arduino with a granule spreader. This will allow the user to sit in their warm house during the winter, and not have to worry about the ice when they leave their house. The design problems are weight distribution, and safely powering the spreader disc. These two problem are small obstacles that will provide for outside the box thinking, and brainstorming. The hopper will hold ten pounds of salt, will be scaled down, and widened to improve weight distribution. The motive forces will be transferred to four individual tank treads to better handle low-friction, and uneven surfaces. The Arduino will take input from an AM receiver, an ultrasonic rangefinder, and a rear facing bump sensor.

Abstract #63
Project Title: Multi-view DIC for measuring operating mode shapes of a cantilever beam
Presenter(s): Vanshaj Srivastava, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract: Stereo-photogrammetry and three-dimensional digital image correlation are being recently used for full-field measurement and collecting operating data of large structures. The conventional technique only provides information at discrete points on large structures. However, photogrammetry can provide a wealth of distributed data. One of the limitation of using a pair of DIC cameras is its limited field of view. A single pair of DIC cameras may not be able to accurately measure the entire structure. To get accurate and desired data, structure is to be divided into few sections and single pair of DIC cameras are used to measure the deformation in the sections. Furthermore, measured deformation of individual sections are stitched to obtain the operating mode shapes of the structure. In this paper, a 3D-DIC measurement is used to measure the resonant frequencies and operating mode shapes of a cantilever beam. The beam is divided into two sections and a single pair of DIC cameras are used to
measure the deformation of each section. The measured deformation of each section of the structure is stitched to extract the operating mode shapes of the structure.

Abstract #64
Project Title: Being Thankful: The Role of Grit and Gender on Gratitude
Presenter(s): Savannah Steward, Undergraduate student; Kyle Suryan, Undergraduate student
Faculty Sponsor(s): Brian Littleton, Psychology, Phillip Nulph
Institution: Mott Community College

Abstract: This present study investigates how age, gender and grit can predict gratitude among college students. Grit has been defined as a perseverance and passion for long-term goals despite failures and adversities. Gratitude has been defined as the quality or feeling of being appreciative or thankful. We believe there is a significant relationship between said variables and gratitude because the survey data suggests a particular correlation. It was predicted that age, gender and grit may have a positive correlation towards gratitude. A regression analysis suggested that said variables were predictors of gratitude among college students. In addition, age and grit uniquely contributed to the accounted variances of gratitude.

Abstract #65
Project Title: Using Phones and Assessment of Learning
Presenter(s): Raymond Sullivan, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: We all see how cell phone use has become excessive over the past two decades. But is there a relationship between cell phone use and exam grades? The current study tested whether the frequency of cell phone turn in rate during class lectures was related to higher exam scores. From the data collected at Mott Community College in a general psychology class, the current study found that there is a weak positive correlation between the two variables, r (145) = .24, p = .003. The results indicate that the hypothesis was supported.

Abstract #66
Project Title: An Investigation Into the Lack of Physical Education Curriculum In American Primary Schools
Presenter(s): India Tailor, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: The efficacy of physical education curriculum has become a controversial topic over the last decade. While many opportunities for physical education are being offered, a majority of such opportunities are not required. Current research has come to question school, district, state, and nationwide policies, and whether or not multi-level improvements in this area of education are necessary. A literature review was conducted to further explore this curriculum. In three nationwide studies, it was found that physical education programs were not up to par. On a smaller scale, teaching methods as well as staff development were considered. In addition, the diversification of physical education curriculum has come into question. Upon investigation, researchers have found that physical education curriculum is lacking nationwide. Physical and health education need to be re-prioritized in primary schools.
Abstract #67
Project Title: Are Women Really the Moody Ones? An Examination of Gender and Neuroticism
Presenter(s): Felicity Terry, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: Previous research has related the trait of neuroticism to being anxious, depressed, and vulnerable to mood swings (Schmitt et al., 2007) and has found females to have higher scores on measures of neuroticism (Gosling, Rentfrow, and Swann, 2003) Using archived data, statistical analyses were performed on comparing gender and neuroticism scores. The sample consisted of 77 females and 33 males. The average neuroticism scores for females was 7.1 (SD= 2.98) and for males was 6 (SD= 2.76). No significant difference was found for neuroticism scores between gender, t (108) = 1.82, p = .07.

Abstract #68
Project Title: Investigating the interaction between Catechins and cellular proteins
Presenter(s): Micheal Thomas, Undergraduate student
Faculty Sponsor(s): Montserrat Rabago-Smith, Chemistry and Biochemistry

Abstract: The various health benefits that green tea confer has been the subject of much study is the past few decades. These studies have revealed that the catechins are the main component of green tea that is responsible for the various health benefits. Catechins are known to have antioxidative properties, however preliminary work done by us have shown the potential for additional interactions of catechins with cellular proteins such as cytochrome c. Kinetic studies which involved mixing various concentrations of cytochrome c and catechins and then detecting the change in wavelength by UV spectrometry, improves on work that was done which shows that the interaction between cytochrome c and catechins is dependent on certain structural features that the catechin have. Cellular observation of EC and EGCG was done using derivatives synthesized with the fluorescent compound FITC. The coupled molecule revealed various details about where in the cell catechins are likely to be transported and suggest areas where they may interact with cellular proteins and cause interactions.

Abstract #69
Project Title: Finite element modeling of skin for vibration analysis
Presenter(s): Rakshita Vivekananda Panchal, Graduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract: Skin cancer is the most common form of cancer in the United States. The mechanical properties of skin are important tissue parameters useful for understanding skin patho-physiology, which can aid medical diagnosis and treatment. Most skin pathologies result in changes of their mechanical properties. Therefore, the evaluation of the elastic properties and natural frequency of skin tissues is important for the early diagnosis and treatment of many skin diseases. The current study uses Finite Element Analysis to identify the changes in the resonant frequencies due to variations in the mechanical properties of human skin. A four layered finite element model of the skin is developed in NX. The layers model the stratum corneum, epidermis, dermis, and subcutaneous fat layer. The results thus obtained from the FEA model helps compare the behavioral characteristics of a healthy skin with a diseased skin in later stages.
Abstract #70
Project Title: Relationship Between Age and Self Actualization
Presenter(s): Diona Wallace, Undergraduate student
Faculty Sponsor(s): Phillip Nulph, Psychology
Institution: Mott Community College

Abstract: The current study proposes to examine the relationship between age and self actualization. It is predicted that older people will be more self actualized. A sample of Mott Community College students was assessed using a measure of self actualization. Results indicate there is not a significant relationship between age and self actualization, $r (98) = .08, p = .43$.

Abstract #71
Project Title: Influence of Extraction Conditions on Antioxidant and Antimicrobial Activities of Juglans Nigra (black walnut) Husk Extracts
Presenter(s): Elijah Ward, Undergraduate student
Faculty Sponsor(s): Michelle Ammerman, Biology; Cheryl Samaniego, Biology
Institution: Kettering University

Abstract: Walnut husks are a byproduct of walnut harvesting, and use of the husks as a source of phytochemicals increases utilization of all walnut components. These phytochemicals may have antioxidant and antimicrobial activities. The effects of walnut husk extraction method on antioxidant and antimicrobial activities were examined using supercritical carbon dioxide and ultrasonic ethanol. Additionally, the effects of post-harvest drying times on antioxidant and antimicrobial activities were examined. The antioxidant capacity of the extracts was evaluated using the Folin-Ciocalteau total phenolic content assay, and HPLC-MS was utilized to characterize compounds found in the extracts. Disc diffusion assays were used to test the antimicrobial effects of walnut husk extracts on multiple strains of bacteria. The antimicrobial assay showed the ability of supercritical and ultrasonic walnut husk extracts to inhibit growth of multiple strains of Gram-negative bacteria. The presentation will discuss the complex relationship between walnut husk extraction conditions, antioxidant values, antimicrobial properties, and compounds contained within the extracts.

Abstract #72
Project Title: Now it's Part of my Identity: International Student Reflections on the Bridge Program
Presenter(s): Joshua Wentz, Graduate student
Faculty Sponsor(s): Emily Feuerherm, English Department
Institution: University of Michigan-Flint

Abstract: Research of academic English as a second language (ESL) programs at institutions of higher education shows that students benefit from these programs but continue to experience obstacles which are not exclusively academic. Existing research relating to international students focuses on their progress in tertiary education, but not much is known about the students’ own impressions of ESL programs. The goal of this project is to examine just how first-year international students used transitional courses, known as the Bridge Program, to adapt to university life in the United States. I distributed a 35 question survey to international students regarding the educational outcomes of the Bridge Program. Then, I conducted 1-to-1 interviews with four participants of the Bridge Program, which were recorded and transcribed. Overall, the participants were pleased with the progress they made with English fluency, and introduction to U.S. university culture helped to ease the transition into tertiary studies.
Abstract #73
Project Title: Measuring Inflation Pressure of a Tire Using a Microphone
Presenter(s): Jonathan Wesley, Undergraduate student
Faculty Sponsor(s): Javad Baqersad, Mechanical Engineering
Institution: Kettering University

Abstract: Tire inflation pressure is conventionally measured using a pressure gauge, be it mechanical or electrical. In this study, a technique is presented to determine the pressure of a tire by using a microphone. This would allow for another means of measurement that even a smartphone could perform. In the proposed technique, the microphone would measure the response of a tire being impacted. Then, the response is transferred from the time domain into the frequency domain to be able to determine the resonant frequencies of the normal modes. These resonant frequencies were observed when the pressure of the tire was changed to determine the tire’s behavior over the range of pressures. There were observable trends between the tire’s normal mode frequency and pressure at lower frequencies.

Abstract #75
Project Title: Modern applications of Lindenmayer Systems
Presenter(s): Justin Wisby, Undergraduate student
Faculty Sponsor(s): Cameron McLeman, Mathematics
Institution: University of Michigan-Flint

Abstract: 3d printing has become quite popular in recent years, giving access to advanced visualization a white board just can't deliver. This increase in usability has brought mathematical visualization to a whole dimension. Objects like Sierpinski’s tetrahedron, plots of two variables, and Klein bottles are the pioneers of the opportunities at our disposal. The problem arises in the development of such objects. Designing the objects can be completed using procedural algorithms called Lindenmayer System. Modern applications, when manipulated correctly, can be used with modern 3D printers to bring complex mathematics to the hand-held variety.

Abstract #76
Project Title: Robot Pentathlon (Kaiju)
Presenter(s): Shuyu Yang, Undergraduate student; Cody Cousins, Undergraduate student; Andrew Ziehm, Undergraduate student; Zihao Yan, Undergraduate student
Faculty Sponsor(s): Quamrul Mazumder, Computer Science, Engineering, and Physics
Institution: University of Michigan-Flint

Abstract: Because of this past summer’s Olympic Games in Rio, Brazil, the ASME has created a competition based off the global event to test students. Engineering students from across the country have created robots to compete with each other in five different events. These events include a sprint, a climb, a lift, a throw, and a golf hit. We have created our own robot that could compete in these events following the guidelines and objectives written. Our personal goal was to engineer this robot to be able to compete and hold its own against the competition that would appear at the event. We analyzed numerous robots that competed in past event. We designed most of this robot using component parts from VeX robotics and Misumi USA in a process referred to as an assembly design. The meticulous design process of the robot strained our team and required our members to apply skill we’ve learned over the course of a roughly six month period. We call this robot the Kaiju because we hoped to create a robot that would be able to excel in the events, and because of the large task it was to engineer this robot for success.
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<td>Black Holes Get a Reality Check: Tempering how we Analyze Quasar Spectra Using Computer Simulations</td>
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