NJIT
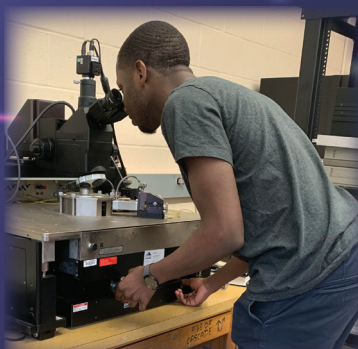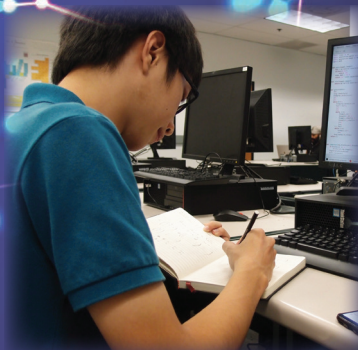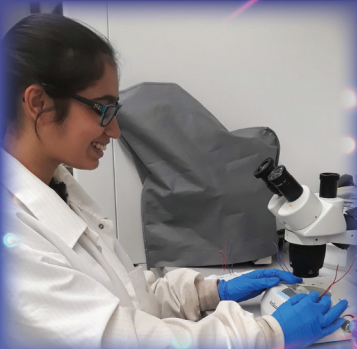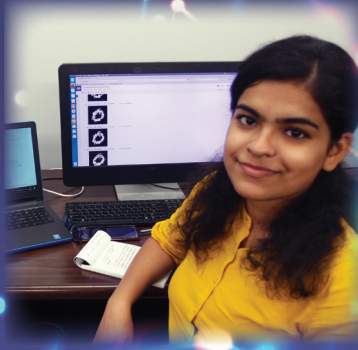## New Jersey Institute of Technology

Twelfth International Undergraduate Summer Research Symposium

Thursday, August 1, 2019

NJIT
New Jersey Institute of Technology

Twelfth International Undergraduate Summer Research Symposium

Thursday, August 1, 2019

Agenda

Student Research Poster Session 1	9:30 a.m. – 11:15 a.m.
Welcome Remarks and Speaker Introduction	11:15 a.m. – 11:25 a.m.
Keynote Lecture Upendra Chivukula *Commissioner, N.J. Board of Public Utilities*	11:25 a.m. – 11:55 a.m.
Lunch and Networking	12:00 p.m. – 12:45 p.m.
Student Research Poster Session 2	12:45 p.m. – 2:30 p.m.
Closing Remarks	2:30 p.m.

Symposium Coordinator: Ms. Angela Retino
McNair Program Coordinator: Ms. Zara Williams

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URI

Undergraduate
Research &
Innovation

Speaker

Upendra Chivukula
Commissioner
N.J. Board of Public Utilities

Upendra J. Chivukula has been a commissioner of the New Jersey Board of Public Utilities since 2014. Chivukula served in the New Jersey Assembly representing the 17th legislative district, where he was chair of the Assembly Telecommunications and Utilities Committee, as well as vice chair of Homeland Security and State Preparedness, Commerce and Economic Development, and Environment and Solid Waste.

Chivukula was a founding member and co-chair of the N.J. Science and Technology Legislative Caucus and the N.J. World Languages and International Studies Legislative Caucus. He was a member of the Commission on Science and Technology and the Health Information Technology Commission. Before becoming a state legislator, Chivukula served as the mayor of Franklin Township for a year and on the Town Council for another seven years. He also served on the National Council of State Legislatures and on the Council of State Governments.

Earlier in his career, Chivukula worked as an engineer for AT&T and as a project engineer for building waste treatment plant control at Leeds & Northrup. He currently serves on the Telecommunications Committee of the National Association of Regulatory Utility Commissioners (NARUC) and is a member of the Mid-Atlantic Conference of Regulatory Utilities Commissioners. In 2015, he was appointed to the Federal Communications Commission's Communications Security, Reliability and Interoperability Council, as well as to NARUC's Telecommunications Act Modernization Task Force.

Chivukula received a bachelor of engineering degree in electrical engineering from College of Engineering, Chennai, India, and a master of engineering degree in electrical engineering from City College, New York. He took graduate courses in electrical engineering at Rutgers University.

PROVOST UNDERGRADUATE SUMMER RESEARCH

John Badiola *(Biomechanical Engineering)* [2-24]
Research: *Development of Tap2Talk Design for Medical Patients with Speech and Motion Deficiencies*
Faculty Adviser: Sergei Adamovich, Department of Biomedical Engineering

Sean Bannon *(Chemical Engineering)* [2-1]
Research: *Creation of a PLGA-Encapsulated Platinum Nanoparticle Drug Delivery System for Treatment of Triple Negative Breast Cancer Using Electrohydrodynamic Co-Jetting*
Faculty Adviser: Kathleen McEnnis, Otto H. York Department of Chemical and Materials Engineering

Quratulain Butt *(Biomedical Engineering)* [2-2]
Research: *Characterization of Cytokines Released for Post-Myocardial Infarction Therapy*
Faculty Adviser: Eun Jung Lee, Department of Biomedical Engineering

Ilham Chahla *(Biomedical Engineering)* **2-3**
Research: *Determination of Mechanical Properties of a Rat Brain Using Simulated Indentations*
Faculty Adviser: Xianlian Zhou, Department of Biomedical Engineering

Ediha Choudhury *(Biomedical Engineering)* [1-6]
Research: *3D Printing PCL/HA-Based Scaffolds for Bone Regeneration*
Faculty Adviser: Murat Guvendiren, Otto H. York Department of Chemical and Materials Engineering, Department of Biomedical Engineering

Matthew DaSilva *(Biomedical Engineering)* [2-4]
Research: *Subject-Specific Finite Element Models of the Foot Joint of Veterans with Spinal Cord Injuries*
Faculty Adviser: Saikat Pal, Department of Biomedical Engineering

Kelly DiCristina *(Biomedical Engineering)* [2-5]
Research: *The Effect of Traumatic Injury on Glial Subtypes*
Faculty Adviser: Bryan Pfister, Department of Biomedical Engineering

Madhusudan Duwadi *(Biomedical Engineering)* [2-6]
Research: *Effect of Tone Duration on Masked Thresholds in Gerbils*
Faculty Adviser: Antje Ihlefeld, Department of Biomedical Engineering

Thinuri Fernando *(Biomedical Engineering)* [2-7]
Research: T*he Relationship between the Reflected and Transmitted Pressure in a Simplified Geometry Model: a Parametric Experimental Study*
Faculty Adviser: Maciej Skotak, Department of Biomedical Engineering

Swata Gade *(Biology)* [2-8]
Research: *Therapeutic Efficacy of Human Mesenchymal Stem Cells in Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Namas Chandra, Venkata Kakulavarapu, Department of Biomedical Engineering

Rama Hannineh *(Biomedical Engineering)* [2-9]
Research: *Advanced Manufacturing of Tissue Engineering Materials: Relating Material Properties and Cutting Mechanics*
Faculty Adviser: Samuel Lieber, Department of Engineering Technology

John Hawks *(Biochemistry)* [2-10]
Research: *High Throughput Assay for Screening KaiC Libraries*
Faculty Adviser: Edgardo Farinas, Department of Chemistry and Environmental Science

Omar Ilyas *(Information Technology)* [2-11]
Research: *Rehabilitating Stroke Patients through Adaptive Digital Environments*
Faculty Adviser: Amy K. Hoover, Department of Informatics

Akm Islam *(Information Technology)* [1-24]
Research: *Developing a Visualization Interface for Urban Data-Driven Social Science Research*
Faculty Adviser: Aritra Dasgupta, Department of Information Systems

Supriya Iyer *(Biomedical Engineering)* [2-7]
Research: *The Relationship between the Reflected and Transmitted Pressure in a Simplified Geometry Model: a Parametric Experimental Study*
Faculty Adviser: Maciej Skotak, Department of Biomedical Engineering

Rachel Lee *(Biomedical Engineering)* [2-12]
Research: *Boron Kinetic Isotope Effect in Boronic Acid Oxidation*
Faculty Adviser: Pier Alexandre Champagne, Department of Chemistry and Environmental Science

Nicole Loehle *(Chemical Engineering)* [2-13]
Research: *Engineering Nanoparticles for Brain Drug Delivery*
Faculty Adviser: Xiaoyang Xu, Otto H. York Department of Chemical and Materials Engineering

Richard Marsh *(Chemical Engineering)* [2-14]
Research: *Sonochemical Degradation of Emerging Pollutants*
Faculty Adviser: Jay Meegoda, Department of Civil and Environmental Engineering

Alvin Mathew *(Biomedical Engineering)* [2-24]
Research: *Development of Tap2Talk Design for Medical Patients with Speech and Motion Deficiencies*
Faculty Adviser: Sergei Adamovich, Department of Biomedical Engineering

Anna Mathew *(Biology)* [2-15]
Research: *Novel Drug Delivery System Using Anti-Angiogenic Peptides for Glioblastoma Multiforme*
Faculty Adviser: Vivek Kumar, Department of Biomedical Engineering

Brian McGrath *(Electronic and Computer Engineering Technology)* [2-16]
Research: *Robotic Leg Prototype for Balance Stability Analysis and Control - PART III: The Nervous System*
Faculty Adviser: Seyyedmohsen Azizi, Department of Engineering Technology

Key: (session number – table number) For example: (2 – 13) is session 2, table number 13

Michael Mobilio *(Information Technology)* [2-17]
Research: *Encouraging the Use of Built-in Language Features for Learning Control Flow*
Faculty Adviser: Michael Lee, Department of Informatics

Mahathi Mohan Gowda *(Forensic Sciences)* [2-18]
Research: *Investigating the Role of a Genetically-Conserved Spinal Neuronal Class, Dmrt3, in the Functional Control of Locomotion in Zebrafish*
Faculty Adviser: Kristen Severi, Department of Biology

Marcos Molina *(Chemical Engineering)* [1-48]
Research: *Integrated Solid-Fluid Interaction Potential for Modeling Gas Adsorption in Templated Mesoporous Carbons*
Faculty Adviser: Gennady Gor, Department of Chemical and Materials Engineering

Jorim Morainvil *(Electronic and Computer Engineering Technology)* [2-19]
Research: *A Low-Cost Electro-Mechanical System to Create 3D Scans Using 2D LIDARs*
Faculty Adviser: Pramod Abichandani, Department of Engineering Technology

Zoraiz Naeem *(Computer Science)* [1-49]
Research: *Theoretical Studies of Possible Topological Edge Modes in Novel Systems*
Faculty Adviser: Ken Ahn, Department of Physics

James Nanchanatt *(Biomedical Engineering)* [2-20]
Research: *Producing Well-Defined Fibrous Structures in Tissue Engineering Scaffolds Using an Adaptable Collector for Electrospinning*
Faculty Adviser: Treena Arinzeh, Department of Biomedical Engineering

Randy Nutakor *(Civil and Environmental Engineering)* [1-56]
Research: *Accessing the Extent and Fate of Legacy Contaminant Mixtures in Sediments*
Faculty Adviser: Lucia Rodriguez-Freire, Department of Civil and Environmental Engineering

Ishani Patel *(Biology)* [1-55]
Research: *The Role of Neural Activity and Semaphorin Signaling in Neural Repair*
Faculty Adviser: Gal Haspel, Department of Biology

Raghav Patel *(Computer Science)* [2-21]
Research: *Understanding Unidentifiability in Dynamic Models from Ground Truth Data*
Faculty Adviser: Horacio Rotstein, Department of Biological Sciences

Navya Pendyala *(Biology)* [2-22]
Research: *Central Auditory Pathology in Blast-Induced Tinnitus/Hearing Loss*
Faculty Adviser: Namas Chandra, Venkata Kakulavarapu, Department of Biomedical Engineering

Andre Pugliese *(Computer Science)* [2-23]
Research: *Satellite Imagery of Insect Structures: Insights into Global Ecological Declines*
Faculty Adviser: Philip Barden, Department of Biological Sciences

Sameer Rana *(Biomedical Engineering)* [2-24]
Research: *Development of Tap2Talk Design for Medical Patients with Speech and Motion Deficiencies*
Faculty Adviser: Sergei Adamovich, Department of Biomedical Engineering

Lindsey Riggs *(Biophysics)* [2-25]
Research: *Apolipoprotein E4 and Cholesterol Packaging in Alzheimer's Disease*
Faculty Adviser: Cristiano Dias, Department of Physics

Ian Rosenberg *(Information Technology)* [2-26]
Research: *Virtual Design Theater: A Multi-User Iterative Production Design Tool*
Faculty Adviser: Margarita Vinnikov, Department of Informatics

Ayushi Sangoi *(Biomedical Engineering and Computer Engineering)* [2-27]
Research: *Assessing the Underlying Neural Mechanism of Vision Therapy Through Phoria Adaptation*
Faculty Adviser: Tara Alvarez, Department of Biomedical Engineering

Sreya Sanyal *(Biology and History)* [2-28]
Research: *A Novel Approach Towards Cholesterol Management Using Hydrogel for PCSK9 Inhibition*
Faculty Adviser: Vivek Kumar, Department of Biomedical Engineering

Jinay Shah *(Chemical Engineering)* [2-29]
Research: *Computational Modeling of Two-Dimensional Nanomaterials for Water Desalination*
Faculty Adviser: Dibakar Datta, Department of Mechanical Engineering

Rahul Shah *(Biomedical Engineering)* [1-31]
Research: *Evaluating the Effect of Skull and Brain Stiffness on Shock Wave Propagation in a Rodent Finite Element Model*
Faculty Adviser: Molly Townsend, Department of Biomedical Engineering

Mahenoor Shaikh *(Mechanical Engineering)* [2-16]
Research: *Robotic Leg Prototype for Balance Stability Analysis and Control - PART I: The "Body" System*
Faculty Adviser: Carlotta Mummolo, Department of Biomedical Engineering

Divjyot Singh *(Applied Physics and Applied Math)* [2-30]
Research: *Numerical Models for Morphology and Optics of Soot Nanoparticles*
Faculty Adviser: Alexei Khalizov, Department of Chemistry and Environmental Science

Francis Stipa *(Biomedical Engineering)* [2-24]
Research: *Development of Tap2Talk Design for Medical Patients with Speech and Motion Deficiencies*
Faculty Adviser: Sergei Adamovich, Department of Biomedical Engineering

Donna Sunny *(Chemical Engineering)* [1-40]
Research: *Investigation of Particle Noise Produced by Tip Sonication*
Faculty Adviser: Kathleen McEnnis, Department of Chemical Engineering

Neha Thati *(Biology)* [2-32]
Research: *Molecular Mechanism of the Circadian Clock in Cyanobacteria*
Faculty Adviser: Yong I. Kim, Department of Chemistry and Environmental Science

Joseph Torsiello *(Applied Physics and Math)* [2-33]
Research: *Computational Modeling of Friction between Two-Dimensional Materials*
Faculty Adviser: Dibakar Datta, Department of Mechanical and Industrial Engineering

Nirali Trivedi *(Biology)* [2-34]
Research: *In Vitro Modeling of Traumatic Brain Injury*
Faculty Adviser: Bryan Pfister, Joshua Berlin, Department of Biomedical Engineering

Shruti Varshney *(Biomedical Engineering)* [2-35]
Research: *Brain Function and Neuroplasticity with Traumatic Brain Injury*
Faculty Adviser: Bharat Biswal, Department of Biomedical Engineering

Abigail Varughese *(Biology)* [2-42]
Research: *Neuromodulation of Sensory Encoding*
Faculty Adviser: Dirk Bucher, Department of Biology

Geetasravya Vegunta *(Biology)* [2-41]
Research: *Measuring the Dynamic Properties of Microglial Cells after Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Madhuvika Murugan, Namas Chandra, Department of Biomedical Engineering

Rashmi Venkatarama *(Biomedical Engineering)* [2-40]
Research: *Minocycline-Loaded Albumin Nanoparticle (myn-ANP) Synthesis and Characterization: A Potential Nanomedicine Approach to Traumatic Brain Injury by Targeting Microglial Cells Activation*
Faculty Adviser: Venkatesan Perumal, Department of Biomedical Engineering

Anuj Verma *(Mechanical Engineering)* [2-39]
Research: *In Situ Ozone Nanobubble Technology for Water Disinfection and Pollutant Degradation*
Faculty Adviser: Wen Zhang, Department of Civil Engineering

Michael Vitti *(Biomedical Engineering)* [2-38]
Research: *Magnetic Spinner Model Provides a Material's Phonon Spectrum*
Faculty Adviser: Camelia Prodan, Department of Physics

Juliana Yang *(Biomedical Engineering)* [1-54]
Research: *Fabrication of Microfluidic Cell Culture Systems for Bacteria and Eukaryotic Cells*
Faculty Adviser: Sagnik Basuray, Otto H. York Department of Chemical and Materials Engineering

Philip Zaleski *(Applied Mathematics)* [2-44]
Research: *Dynamics of Cone-Shaped Meniscus on a Substrate-Supported Drop in Electric Fields*
Faculty Adviser: Shahriar Afkhami, Department of Mathematics

RONALD E. MCNAIR ACHIEVEMENT PROGRAM

Sara Abdelhamid *(Chemical Engineering)* [1-1]
Research: *Effect of Tank Bottom Shapes on Power Dissipation, Power Number and Njs in Stirred Vessels under Different Baffling Configurations*
Faculty Adviser: Piero Armenante, Department of Chemical and Materials Engineering

Ehtesham Ahmed *(Electrical Engineering) (Minor in Computer Science)* [1-2]
Research: *Raspberry Pi as FSO Transceiver Using UART Communication for Drone-Assisted Networking*
Faculty Adviser: Nirwan Ansari, Department of Electrical and Computer Engineering

Gabby Amparo *(Biology)* [1-3]
Research: *Examination of Water Stress on the Morphological Evolution of Capsella Bursa-Pastoris*
Faculty Adviser: Rebecca Panko, Department of Biological Sciences

Iren Atalla *(Biomedical Engineering) (Minor in Chemistry)* [1-4]
Research: *Alignment Analysis of Cardiomyocytes on Patterned vs. Flat Scaffolds*
Faculty Advisers: Murat Guvendiren, Andrew House, Department of Biomedical Engineering

David Bushiri *(Mechanical Engineering) (Minor in Business)* [1-5]
Research: *Investigation of Interlayer Strength of 3D-printed Polymers*
Faculty Adviser: Murat Guvendiren, Department of Biomedical Engineering

Ediha Choudhury *(Biomedical Engineering)* [1-6]
Research: *3D Printing PCL/HA-Based Scaffolds for Bone Regeneration*
Faculty Adviser: Murat Guvendiren, Department of Biomedical Engineering

Felix De Dios *(Chemical Engineering)* [1-7]
Research: *Shear-Enhanced ESSENCE Biosensor for the Detection of a Target DNA*
Faculty Adviser: Sagnik Basuray, Department of Chemical and Materials Engineering

Cruz Donato *(Mechanical Engineering)* [1-8]
Research: *Design of a Cable-Driven Exoskeleton for Hand Rehabilitation Post Stroke*
Faculty Adviser: Sergei Adamovich, Department of Biomedical Engineering

Kevin Nino *(Mechanical Engineering) (Minor in Computer Science)* [1-9]
Research: *Database of Mechanism Animations*
Faculty Adviser: Balraj Subra Mani, Department of Mechanical and Industrial Engineering

Jaime Siguenza *(Mechanical Engineering)* [1-9]
Research: *Database of Mechanism Animations*
Faculty Adviser: Balraj Subra Mani, Department of Mechanical and Industrial Engineering

HONORS SUMMER RESEARCH FELLOWSHIP

Deva Craig [1-32]
Research: *Materials - Photon Interactions in Multilayers*
Faculty Adviser: Ravindra Nuggehalli, Department of Physics

Maria DeOliveira *(Mechanical Engineering)* [1-33]
Research: *Effects of UV Exposure on the Mechanical Behavior of Cellulose Acetate*
Faculty Adviser: Shawn Chester, Department of Mechanical and Industrial Engineering

Nishaant Goswamy *(Computer Engineering, Minor in Business)* [1-34]
Research: *The Effect of Autonomous Vehicles on Human Driving Behavior*
Faculty Adviser: Cong Wang, Department of Electrical and Computer Engineering

Katherine Ji *(Biology)* [1-42]
Research: *An Exploratory Study into the Effects of Total Sleep Deprivation Using fNIRS*
Faculty Adviser: Dr. Bharat Biswal, Department of Biomedical Engineering

Manisha Kannan *(Biology)* [1-41]
Research: *Apocynin-Loaded Albumin Nanoparticle Formulation, Characterization and Evaluation in an In Vivo Traumatic Blast Injury Model*
Faculty Adviser: Venkatesan Perumal, Namas Chandra, Department of Biomedical Engineering

Brian McGlew [2-49]
Research: *Using Ozone Nanobubbles and Ultrasound to Treat Sediment Contamination*
Faculty Adviser: Jay Meegoda, Department of Civil and Environmental Engineering

George Mina *(Biomedical Engineering)* [1-39]
Research: *Fabrication of a Microscope Stage Compatible Incubator for Live Cell Imaging*
Faculty Adviser: Bryan Pfister, Joshua Berlin, Department of Biomedical Engineering

Chandni Patel *(Biology)* [1-38]
Research: *Changes in Synaptic and Axonal Proteins as a Function of Time in Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Venkata RamaRao Kakulavarapu, Namas Chandra, Department of Biomedical Engineering

Xavier Reyes *(Biology)* [1-43]
Research: *The Effect of Land Area on Ecological Niches: A Study of Ants and Islands*
Faculty Adviser: Phillip Barden, Department of Biological Sciences

Gregory Tanis *(Mechanical and Industrial Engineering)* [1-35]
Research: *Collection and Analysis of Global Navigation Satellite System Positioning Data with SBAS and RTK for Autonomous Lawn Mowers*
Faculty Adviser: Cesar Bandera, Martin Tuchman School of Management

Zenit Winfield *(Biomedical Engineering)* [1-44]
Research: *Rodent-to-Human Scaling Laws: The Evaluation of Biofidelic Materials for the Rat Head Model under Shock Wave Loading*
Faculty Adviser: Maciej Skotak, Namas Chandra, Department of Biomedical Engineering

NATIONAL SCIENCE FOUNDATION (NSF) - COMMUNITY COLLEGE BIOMATHEMATICAL RESEARCH INITIATION PROGRAM (C2BRIP)

Shuhrah Chowdhury *(Mathematics)* [1-45]
Research: *Mathematical Modeling of Circadian Rhythms, Tumor Growth and Radiotherapy*
Advisor: Casey Diekman, Department of Mathematical Sciences

Elizabeth Epstein *(Mathematics - Essex County College)* [1-46]
Research: *Exploring the Viability of a PLSR-based Machine Learning Method for Predicting Circadian Phase in Cancer Patients*
Advisor: Casey Diekman, Department of Mathematical Sciences

Mariia Goriachi *(Biology/Pre-Medicine - Essex County College)* [1-45]
Research: *Mathematical Modeling of Circadian Rhythms, Tumor Growth and Radiotherapy*
Advisor: Casey Diekman, Department of Mathematical Sciences

Luis Lara *(Mechanical Engineering - Essex County College)* [1-45]
Research: *Mathematical Modeling of Circadian Rhythms, Tumor Growth and Radiotherapy*
Advisor: Casey Diekman, Department of Mathematical Sciences

Karen Reyes *(Biology/Pre-Medicine - Essex County College)* [1-46]
Research: *Exploring the Viability of a PLSR-based Machine Learning Method for Predicting Circadian Phase in Cancer Patients*
Advisor: Casey Diekman, Department of Mathematical Sciences

NSF RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU) – COMPUTATIONAL DATA ANALYTICS FOR ADVANCING HUMAN SERVICES

Alexander Barrett *(Harvard University - Applied Mathematics and Physics, Secondary in Computer Science)* [1-10]
Research: *Machine Learning Approaches for Optimizing Long-Short Portfolios*
Faculty Adviser: Zhi Wei, Department of Computer Science

Peter Boyland *(Carnegie Mellon University - Cognitive Science and Computer Science, Minor in Language Technologies)* [1-12]
Research: *Deep Learning with Application to Software Engineering*
Faculty Adviser: Shaohua Wang, Department of Informatics

Andrew Chen *(Carnegie Mellon University – Discrete Mathematics, Minor in Computer Science)* [1-12]
Research: *Deep Learning with Application to Software Engineering*
Faculty Adviser: Shaohua Wang, Department of Informatics

Peter Decker *(County College of Morris – Computer Science)* [1-14]
Research: *Eye Blinks Detection and Labeling*
Faculty Adviser: Guiling Wang, Department of Computer Science

Mihail Kaburis *(The University of South Florida – Computer Science)* [1-15]
Research: *Spatiotemporal Analysis of Racial Bias in NYPD Stop, Question and Frisk Procedures*
Faculty Adviser: Xinyue Ye, Department of Informatics

Samantha Kamath *(University of Miami – Computer Science and Political Science)* [1-15]
Research: *Spatiotemporal Analysis of Racial Bias in NYPD Stop, Question and Frisk Procedures*
Faculty Adviser: Xinyue Ye, Department of Informatics

Jasmine Medlock *(University of Maryland, Baltimore County – Computer Engineering)* [1-15]
Research: *Spatiotemporal Analysis of Racial Bias in NYPD Stop, Question and Frisk Procedures*
Faculty Adviser: Xinyue Ye, Department of Informatics

Farukh Saidmuratov *(Rensselaer Polytechnic Institute – Computer Science)* [1-12]
Research: *Deep Learning with Application to Software Engineering*
Faculty Adviser: Shaohua Wang, Department of Informatics

Mohamad Sherif *(Middlesex County College – Computer Science)* [1-10]
Research: *Machine Learning Approaches for Optimizing Long-Short Portfolios*
Faculty Adviser: Zhi Wei, Department of Computer Science

Miriam Tan *(Grove City College – Computer Science)* [1-14]
Research: *Eye Blinks Detection and Labeling*
Faculty Adviser: Guiling Wang, Department of Computer Science

Ruohan Wu *(Smith College – Engineering Science, Minor in Computer Science)* [1-10]
Research: *Machine Learning Approaches for Optimizing Long-Short Portfolios*
Faculty Adviser: Zhi Wei, Department of Computer Science

NSF REU – EXPEDITIONS IN TRAINING, RESEARCH, AND EDUCATION FOR MATHEMATICS AND STATISTICS THROUGH QUANTITATIVE EXPLORATIONS OF DATA (EXTREEMS-QED)

John DeSalvo *(Mathematics)* [2-45]
Research: *Machine Learning Models for the Dynamics of Ferrofluids*
Faculty Adviser: Shahriar Afkhami, Department of Mathematical Sciences

NSF REU – FUSION OF DATA AND POWER FOR A CONTROLLABLE POWER DELIVERY GRID

Diego Ramos *(Electrical and Computer Engineering)* [1-47]
Research: *Design and Experimental Tests of an Energy Packet Switch Testbed for a Digital Microgrid*
Faculty Adviser: Roberto Rojas-Cessa, Department of Electrical and Computer Engineering

Lenin Ham *(Electrical and Computer Engineering)* [1-47]
Research: *Design and Experimental Tests of an Energy Packet Switch Testbed for a Digital Microgrid*
Faculty Adviser: Roberto Rojas-Cessa, Department of Electrical and Computer Engineering

NSF REU - OPTICS AND PHOTONICS: TECHNOLOGIES, SYSTEMS, AND DEVICES

Omar Aref *(Computer Engineering)* [1-11]
Research: *III-Nitride Nanowire Deep Ultraviolet Light-Emitting Diodes for Precise Applications*
Faculty Adviser: Hieu Nguyen, Department of Electrical and Computer Engineering

Shweta Burgula *(Chemical and Biological Engineering), Rensselaer Polytechnic Institute* [1-13]
Research: *Use of Rhenium Disulfide to Improve Sensitivity of a Lab-on-a-Chip Device*
Faculty Adviser: Sagnik Basuray, Department of Chemical and Materials Engineering

Arijit Dutta *(Bioengineering), Swanson School of Engineering, University of Pittsburgh* [1-16]
Research: *Visualization and Characterization of Etched-Based On-Chip Plasma Self-Separation*
Faculty Adviser: Eon Soo Lee, Department of Mechanical and Industrial Engineering

Ethan Espin (Electrical and Computer Engineering), West Carolina University [1-17]
Research: *Silver Nanowires as Infrared Transparent Electrodes*
Faculty Adviser: Dong Ko, Department of Electrical and Computer Engineering

Kalid D-Luyando Flusa *(Computer Engineering), Universidad Ana Mendez (Puerto Rico)* [1-18]
Research: *A Multi-Platform Optics and Photonics Educational Application*
Faculty Adviser: John Carpinelli, Department of Electrical and Computer Engineering

Seunghoon Kim *(Computer Engineering) City University of New York* [1-19]
Research: *Applications of Visible Light Communication Systems for Intelligent Consumer Messaging and Indoor Positioning*
Faculty Adviser: Edwin Hou, Department of Electrical and Computer Engineering

Eric Kraut *(Electrical and Computer Engineering), Rutgers University* [1-20]
Research: *Kalman Filter Implementation in Compression Optical Coherence Elastography Tissue Motion*
Faculty Adviser: Xuan Liu, Department of Electrical and Computer Engineering

Devynn Saunders *(Biomedical Engineering), University of Minnesota* [1-21]
Research: *Denoising fNIRS Data by Integrating Independent Component Analysis and Short Channel Separation Regression*
Faculty Adviser: Xiaobo Li, Department of Biomedical Engineering

Oladimeji Sobanjo *(Applied Engineering and Technology)* [1-22]
Research: *CMOS-Compatible RRAM Devices*
Faculty Adviser: Durgamadhab Misra, Department of Electrical and Computer Engineering

U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND ARMAMENTS CENTER

Sahar Abulaimoun *(Biomedical Engineering)* [1-36]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design, John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Erik Aleksanyan *(Applied Physics)* [1-36]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design, John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Adam Czyrsznic *(Biomedical Engineering)* [1-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design, John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Karina Dsouza *(Biomedical Engineering)* [1-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Jacqueline Farkas *(Mechanical Engineering)* [1-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Matthew Frazier *(Computer Engineering)* [2-36]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Kalib Guthrie (Mechanical Engineering) 2-36
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Craig Iaboni *(Computer Science)* [2-36]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Kyle LaPolice *(Mechanical Engineering)* [2-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Brittany Morales *(Mechanical Engineering)* [2-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

David Monroe *(Applied Physics)* [2-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Aashka Patel *(Computer Science)* [1-36]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

Ben Ruoff *(Industrial Design)* [1-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

NJ SPACE GRANT CONSORTIUM SUMMER RESEARCH

Kyle Cowing *(Engineering Physics - Ramapo College)* [1-36]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

James Smith *(Engineering Physics - Ramapo College)* [2-37]
Research: *Collaborative Robotics for Cave and Tunnel Exploration*
Faculty Advisers: Martina Decker, J. Robert and Barbara A. Hillier College of Architecture and Design; John Federici, Samuel Gatley and Louis Rizzo, Department of Physics

HERITAGE INSTITUTE OF TECHNOLOGY, INDIA – NJIT SUMMER RESEARCH

Ishita Bardhan *(Computer Science and Engineering - Heritage Institute of Technology)* [1-23]
Research: *Defense Mechanisms for Adversarial Attacks*
Faculty Adviser: Abdallah Khreishah, Department of Electrical and Computer Engineerin

Abhijot Bedi *(Computer Science and Engineering - RPS Group of Institutions)* [1-24]
Research: *Visual Analytics for Data-Driven Social Science*
Faculty Adviser: Aritra Dasgupta, Department of Informatics

Arghyadip Bose *(Biotechnology - Heritage Institute of Technology)* [1-25]
Research: *Stability Analysis of Self-Assembling Peptide Hydrogels*
Faculty Adviser: Vivek Kumar, Department of Biomedical Engineering

Michael Qi Yin Chen *(Computer Science and Engineering - Heritage Institute of Technology)* [1-26]
Research: *Exploring Dimension Reduction Techniques for Deep Image Compression*
Faculty Adviser: Gary (Qing) Liu, Department of Electrical and Computer Engineering

Mahima Choudhury *(Biotechnology - Heritage Institute of Technology)* [1-27]
Research: *3D Printing of Anatomical Models for Pre-Surgical Planning*
Faculty Adviser: Murat Guvendiren, Department of Chemical and Materials Engineering

Samriddha Dutta *(Biotechnology - Heritage Institute of Technology)* [1-28]
Research: *Investigating Hydrolytic Stability and Changes in Mechanical Properties of Electrospun Crosslinked Gelatin Scaffolds*
Faculty Adviser: Treena Arinzeh, Department of Biomedical Engineering

Shivansh Gupta *(Computer Science and Engineering - BRCM College of Engineering and Technology)* [1-29]
Research: *Minimizing Energy Consumption for Hadoop Jobs under Deadline Constraints*
Faculty Adviser: Chase Wu, Department of Computer Science

Hardik Jhamb *(Computer Science and Engineering - BRCM College of Engineering and Technology)* [1-30]
Research: *Buy Online, Fulfill from Store – Assignment of Products to the Fast-Picking Zone*
Faculty Adviser: Sanchoy Das, Department of Mechanical and Industrial Engineering

CENTER FOR INJURY BIOMECHANICS, MATERIALS & MEDICINE (CIBM3) UNDERGRADUATE SUMMER RESEARCH

Thinuri Fernando *(Biomedical Engineering)* [2-7]
Research: *The Relationship between the Reflected and Transmitted Pressure in a Simplified Geometry Model: a Parametric Experimental Study*
Faculty Adviser: Maciej Skotak, Department of Biomedical Engineering

Swata Gade *(Biology)* [2-8]
Research: *Therapeutic Efficacy of Human Mesenchymal Stem Cells in Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Namas Chandra, Venkata Kakulavarapu, Department of Biomedical Engineering

Supriya Iyer *(Biomedical Engineering)* [2-7]
Research: *The Relationship between the Reflected and Transmitted Pressure in a Simplified Geometry Model: a Parametric Experimental Study*
Faculty Adviser: Maciej Skotak, Department of Biomedical Engineering

Manisha Kannan *(Biology)* [1-41]
Research: *Apocynin-Loaded Albumin Nanoparticle Formulation, Characterization and Evaluation in an In Vivo Traumatic Brain Injury Model*
Faculty Adviser: Venkatesan Perumal, Namas Chandra, Department of Biomedical Engineering

Chandni Patel *(Biology)* [1-38]
Research: *Changes in Synaptic and Axonal Proteins as a Function of Time in Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Venkata RamaRao Kakulavarapu, Namas Chandra, Department of Biomedical Engineering

.

Navya Pendyala *(Biology)* [2-22]
Research: *Central Auditory Pathology in Blast-Induced Tinnitus/Hearing Loss*
Faculty Adviser: Namas Chandra, Venkata Kakulavarapu, Department of Biomedical Engineering

Rahul Shah *(Biomedical Engineering)* [1-31]
Research: *Evaluating the Effect of Skull and Brain Stiffness on Shock Wave Propagation in a Rodent Finite Element Model*
Faculty Adviser: Molly Townsend, Department of Biomedical Engineering

Alekhya Thota *(Biology)* [2-46]
Research: *Blood-Brain Barrier Permeability as Injury Criteria in Repeated Low-level Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Venkata RamaRao Kakulavarapu, Department of Biomedical Engineering

Geetasravya Vegunta *(Biology)* [2-41]
Research: *Measuring the Dynamic Properties of Microglial Cells after Blast-Induced Traumatic Brain Injury*
Faculty Adviser: Madhuvika Murugan, Namas Chandra, Department of Biomedical Engineering

Rashmi Venkatarama *(Biomedical Engineering)* [2-40]
Research: *Minocycline-Loaded Albumin Nanoparticle (myn-ANP) Synthesis and Characterization: A Potential Nanomedicine Approach to Traumatic Brain Injury by Targeting Microglial Cells Activation*
Faculty Adviser: Venkatesan Perumal, Department of Biomedical Engineering

Zenit Winfield *(Biomedical Engineering)* [1-44]
Research: *Rodent-to-Human Scaling Laws: The Evaluation of Biofidelic Materials for the Rat Head Model under Shock Wave Loading*
Faculty Advisers: Maciej Skotak, Namas Chandra, Department of Biomedical Engineering

OTHER

Manav Guzraty *(Mechanical Engineering – Essex Community College)* [2-43]
Research: *Nonlinear Dynamics of Tandem Flapping Wings*
Faculty Adviser: Anand U. Oza, Department of Mathematical Sciences

Tiffany Olivera *(Chemistry)* [2-48]
Research: *Designing Amyloid-Inspired β-Sheet Fibrils from L- and D-Handed Peptides*
Faculty Adviser: Cristiano L. Dias, Department of Physics

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