

## Developing High Impact Programs: Building Systems Integration and Technology Solutions

Due to Covid-19 travel restrictions, the Association of Technology, Management, and Applied Engineering (ATMAE) visiting team conducted a virtual visit of our programs on April 19 - April 21, 2020. The team will submit their recommendation to ATMAE for approval during the Board of Accreditation hearings at the 2020 ATMAE conference in Louisville, Kentucky in October 2020. We are very pleased with the team's findings and recommendations, and we appreciate the advisory board's expertise and support.

The Kentucky Council for Postsecondary Education (CPE) approved Morehead State University's Bachelor of Science Degree in Systems Integration Engineering (BSSIE). The program, which will be offered in the fall 2020 semester, integrates an appropriate blend of science, physics, and mathematics with hands-on design, mechanical, and electrical engineering content to prepare graduates who are capable of applying engineering and mathematical concepts to solve complex systems-based technological problems.

Graduates of the BSSIE program will be interdisciplinary professionals who focus on the functionality of the entire system, as opposed to individual components in isolation. They will be responsible for ensuring that the various components of the system are well integrated and function together with appropriate performance and security. The program will provide opportunities for the underserved people in Eastern Kentucky to receive a high quality STEM education, with high-paying jobs. The conjunction of BSSIE and the 21st Century Center for Manufacturing Systems will provide significantly more hand-on learning opportunities for students who seek a higher-level engineering education.

With the award of a \$500,000 NSF-EPSCoR grant, the faculty and staff, including a postdoctoral researcher, graduate assistants, and undergraduate research fellows, have begun to expand the 21st Century Center for Manufacturing Systems. The center aims to provide training in Sustainable



Dr. Jorge Moody and undergraduate research fellow Levi Howell working on a VR training scenario in the Sustainable Advanced Manufacturing lab.

Advanced Manufacturing (SAM), and Industrial Controls that would support our new Systems Integrated Engineering program.

The Computer Science program focuses on preparing graduates to design and implement solutions for new problems, be ready to pursue 21st Century careers in the diverse fields of Computer Science, and be able to pursue the study of Computer Science at the graduate level.

The CS faculty have made major curriculum revision and added new tracks including Data Science and Computer Engineering that will be offered in the fall semester 2020. The revised CS program will include Cybersecurity, Computer Gaming, and Advanced Topics.

Sincerely,

Ahmad Zargari  
Professor and Associate Dean  
School of Engineering and Computer Science

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# FACULTY spotlight

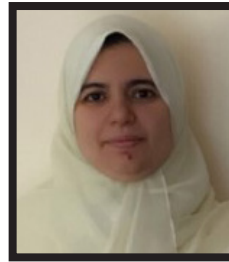


**Cheng Cheng**

Dr. Cheng was invited to contribute a book chapter “AC Electrokinetics-enhanced Capacitive Virus Detection” (under review) to Professor Mohamad Sawan’s book, *Handbook of Biochips: Integrated*

*Circuits and Systems for Biology and Medicine*, New York, NY: Springer. This book provides a broad survey of the field of biochips, including fundamentals of microelectronics and biomaterials interaction with various, living tissues, as well as numerous, diverse applications. Although a wide variety of biochips will be described, there will be a focus on those at the brain-machine interface. Analysis is included of the relationship between different categories of biochips and their interactions with the body and coverage includes wireless remote control of biochips and arrays of microelectrodes, based on new biomaterials.

Dr. Cheng and his student’s abstract “Development of an AC Electrokinetics Capacitive Sensing Platform for Rapid and Sensitive Bioparticles Detection” is accepted and they will present at 19th Annual Posters-at-the-Capitol at the Capitol Rotunda in Frankfort, KY.



**Heba Elgazzar**

Dr. Heba Elgazzar received an internal research grant for “Design and Implementation of Network Science Algorithms for Social Networks” Heba and her student Craigory Coppola had their work “Novel Machine Learning Algorithms for Centrality and Cliques Detection

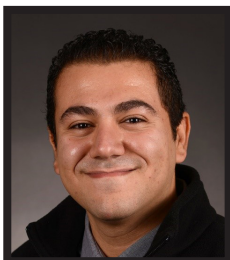
in YouTube Social Networks” published in the *International Journal of Artificial Intelligence & Applications*, January 2020 issue.

Dr. Elgazzar and Dr. Sahar Ghanem had their abstract for “Prediction of FRP-RC Columns Behavior Using Data Mining Techniques” accepted for an oral presentation at the EMI/PMC 2020 Conference to be held May 26-29, 2020, at Columbia University, New York City.

Dr Elgazzar’s student Craigory Coppola presented their research on “Novel Machine Learning Algorithms for Centrality and Cliques Detection in Social Networks” at the annual Posters at the Capitol held on March 5, 2020.

# STUDENT spotlight

**Ahmed Abdallah**



Ahmed Abdallah is a Master of Science in Engineering and Technology Management student and a Graduate Assistant in the Craft Academy. He previously received a bachelor’s degree in Civil Engineering. Before coming to Morehad State University, Ahmed worked for five years on construction projects before being admitted to the program.

Ahmed’s main research interest is Seismic evaluation and retrofit of buildings. His professional goals and interests are Construction Management, Lean Project Management, Highway and Bridge inspection.

**Seba Gravitt**



Seba Gravitt is a sophomore majoring in Engineering Technology-Construction Management and Civil Area at Morehead State University. She has acquired the Diversity Scholarship and the Vex Robotics Scholarship and the CITI certification, which have helped with her success at Morehead State University.

Seba is in the National Science Foundation Program and is an undergraduate research student who is working with Professor Kouroush Jenab and Professor Jorge Alberto Ortega-Moody on a virtual reality tractor simulation to help with training agricultural workers. Seba joined the Undergraduate Research Fellowship Program to gain experience on using different modeling software and to expand her knowledge on other engineering areas.

# ALUMNI spotlight



## Newell Lindon

Newell Lindon, Operations Manager, joined Finley Engineering in 2010 after graduating from Morehead State University with a Bachelor of Engineering Technology. Prior to college he worked in the fiber industry which provided him the opportunity to gain work experience before he graduated. Since he joined Finley, Newell has gained

valuable work experience to further his ongoing education in the industry.

Newell started in the field staking fiber routes and performing construction inspection for both aerial and buried fiber. He's served as a Resident Engineer on both aerial and buried projects, Project Management for various Kentucky, Illinois, and Indiana Clients and most recently Operations Management.

He has managed both outside and inside resources to complete project on time and under budget. He also actively assisted with fiber optic designs for both active and passive networks, cost estimates related to fiber optic networks, and general technical support for both OSP and internal. Newell has gained valuable work experience and knowledge and is recognized as a valuable asset for Finley Engineering.



## Adam Mellenkamp

Adam Mellenkamp received his Bachelor of Science in Industrial Engineering and Technology from Morehead State University in 2002 and his Masters in Project Management from St Mary's University in 2018.

Adam has been employed by STOBBER DRIVES INC in Maysville, Ky since his

graduation in 2002. He began at STOBBER as a Product Engineer and is currently a Product Manager responsible for all of the companies products.

Adam feels the education he received at Morehead State University set him on the right path to attain many of the professional goals that he has been able to meet. Adam and his family reside in Maysville, KY. He enjoys spending time outdoors with the family and cycling.



## Wayne Stevens

Wayne Stevens, a 2012 Graduate of Morehead State University, received a Bachelor of Science in Engineering Technology. After graduating Morehead State, he decided to continue his education at Maysville Community and Technical College where he completed the welding program, receiving certificates in both arc and MIG Welding.

Shortly after completing his studies at MCTCS, he began working for Kyosan Denso Manufacturing of Kentucky (KDMK) in Mt. Sterling KY. Starting off as a Production Supervisor, Wayne learned a lot of hands on about lean manufacturing and combined with what he learned at MSU, he was able to apply it to his job.

After just 6 months of being a Production Supervisor, Wayne was given the opportunity to interview for an open Engineering position and was awarded with a promotion. After working in the engineering department at KDMK for a few months, he made the decision to go back to MSU to complete a Master of Science in Engineering and Technology Management.

In 2017, he completed his Master's degree and began teaching classes as an Adjunct Professor at MSU. Wayne was also promoted to Senior Engineer at KDMK where he took on more of a leadership role, and training of new associates. He was responsible for new projects, scheduling, PLC's, Denso 6 axis robot programming and troubleshooting.

He has been at KDMK now for six years and was recently asked to join a team and lead a new department. The Departmental focus is Direct Material where Wayne uses his Engineering background to find ways to help KDMK be more profitable. In the first year of his new department, the team successfully met their target savings and are on track to continue that success in the new fiscal year 2020.

# ADVISORY BOARD *spotlight*

## Michelle Legge



Michelle “Shelly” Legge graduated from Maysville Community Technical College in 2003 with an AS with an Electrical Specialty and then transferred to Morehead State University graduating in 2013 with a Bachelor of Science in Technology Management Magna Cum Laude. During her education she became an Engineering Intern for Black & Veatch at the Dayton Power & Light Generating Stations in

Aberdeen, Ohio and Manchester, Ohio. In 2008, she was hired by DP&L as a Scheduler.

In 2015, Shelly was promoted to the Planning Manager at DP&L Killen Station in Manchester, Ohio and in 2018, she was promoted to the Planning Manager of both DP&L Stuart (2400 MW) and Killen (650 MW) Stations where she oversaw the planning and scheduling of both of the plants. She also became a facilitator of outage audits globally at this time.

In 2019, Shelly took a role in the Norms, Standards, and Systems of AES Asset Management in Indianapolis, Indiana. AES being the parent company of Dayton Power & Light and Indianapolis Power & Light among other businesses globally. Most recently, she is overseeing the Reliability Engineers and the global implementation of asset management software.

When not traveling around the world to mentor and coach the facilitation of our outage maintenance program and assisting or implementing new software tools, she enjoys spending time at NASCAR racing events; especially Bristol, TN.

## ETM Students Achieve above 90% on the CTM Exam Since 2017

Morehead State University’s Engineering and Technology Management (ETM) graduating classes achieved above 90% pass rate on the Certified Technology Manager (CTM) Exam in since 2017. The CTM Exam is nationally administered through the Association of Technology, Management and Applied Engineering (ATMAE) to certify graduates of ATMAE accredited programs.

A minimum score of 95 out of 160 in the categories of Leadership, Self-Management, Systems, Processes, Operations, People, Project, Quality, Risk and Safety is currently required to qualify for certification. CTM is the initial certification status awarded to applicants who meet ATMAE’s requirements for certification. CTM certification holders may report continuing education activity to qualify for Certified Senior Technology Manager (CSTM) status. ATMAE Certification recognizes expertise in a specific field, a mark of distinction that sets the certification holder apart. ATMAE Certification provides external validation of knowledge and competence in the discipline.

“ETM students take the Certified Technology Manager (CTM) exam prior to graduation in their senior year. The Chair of the ATMAE Board of Certification reports that the historical average national pass rate for the CTM exam is 67% and MSU’s ETM students has earned over 90% pass rate since 2017. We are proud of ETM faculty and graduating seniors for their success,” said School of Engineering and Computer Science, Associate Dean Dr. Ahmad Zargari.

## Scott Wells

William Scott Wells began his career by graduating as valedictorian of Morgan County High School. He received a Bachelor of Science in Civil Engineering from Purdue University.

Upon graduating he returned to his home town of West Liberty and joined the family business, the Wells Group.

He has served his profession as a member of the American Concrete Institute, Past President and current Director of the Board of the Kentucky Ready-Mixed Concrete Association, Director of the Builder’s Supply Association of West Virginia, Director of the Kentucky Construction Industry Trust, and active member of the Advisory Board for the Morehead State University Department of Engineering and Technology Management.

Scott has served his community in a variety of roles including as a volunteer firefighter, and former Mayor of West Liberty.



## MSU one of eight Kentucky colleges awarded National Science Foundation's EPSCoR grant

Morehead State University, along with six other Kentucky schools, is collaborating with the University of Kentucky (UK) on the Kentucky National Science Foundation's (NSF) EPSCoR (Established Program to Stimulate Competitive Research) grant. Those institutions have been awarded a five-year, \$24 million grant to support the fundamental science needed to advance next-generation manufacturing technologies, flexible electronics and robotics. The grant will also support the development of a greater STEM-literate workforce.

The project is titled the Kentucky Advanced Partnership for Enhanced Robotics and Structures (KAMPERS) and will harness the collective research power of 40 multidisciplinary researchers from the eight Kentucky universities and colleges. These include MSU, UK, University of Louisville (UofL), Eastern Kentucky University, Kentucky State University, Somerset Community College, Transylvania University and Western Kentucky University. Each of these institutions has developed niche areas of expertise to become leaders in next-generation manufacturing technologies.

Dr. Kouroush Jenab and Dr. Jorge Ortega-Moody, both assistant professors of engineering and technology management at MSU, received \$500,000 to develop the laboratory for training in Condition Based Maintenance (CBM), Sustainable Advanced Manufacturing (SAM) and Industrial Controls. The MSU research team includes one post-doctorate candidate, two graduate assistants and two

Undergraduate Research Fellows, all supported by the grant.

In next five years, the team will have a close collaboration with the UK and UofL research teams to develop testbed and modules in MSU's 21st Century Center for Manufacturing Systems for the following priorities: industrial controls, condition-based maintenance, and sustainable advanced manufacturing theories; training modules/workshops for manufacturing technician workforce and K-12 summer program; outreach to advanced manufacturing; support advanced manufacturing entrepreneurs; and an augmented and virtual reality laboratory (AVRL) to simulate real behavior of industrial and manufacturing equipment, training in the areas of control, automation and electrical maintenance. As a result, this project will forge partnerships with industries and other stakeholders and prepare a well-trained workforce capable of meeting the needs of advanced manufacturing sectors in Kentucky and beyond.

For more information on MSU's Department of Engineering and Technology Management, visit [www.moreheadstate.edu/etm](http://www.moreheadstate.edu/etm), email [etm@moreheadstate.edu](mailto:etm@moreheadstate.edu) or call 606-783-2418.

To learn more about MSU's Office of Research and Sponsored Programs, visit [www.moreheadstate.edu/research](http://www.moreheadstate.edu/research).

## Rashad is senior member of IEEE

Dr. Sherif Rashad, professor of computer science at Morehead State, has been elevated to the grade of senior member by the Institute of Electrical and Electronics Engineers (IEEE), an honor bestowed only to those who have made significant contributions to their profession.

Senior membership is the highest grade for which IEEE members can apply and it is based on significant contributions to the profession. Only about one in ten IEEE members holds this prestigious grade, which is conferred to those with extensive experience and reflects professional maturity. IEEE senior members are recognized for their technical and professional excellence and are eligible to hold executive IEEE volunteer positions and to refer and review senior membership applications.

Rashad recently led the effort to introduce new degree concentrations in data science and computer engineering starting in fall

2020. His research interests include machine learning, data science, mobile computing and cybersecurity. He received several research awards and his research papers have been published in many international journals and IEEE conferences.

IEEE is the world's largest professional organization dedicated to advancing technological innovation and excellence for the benefit of humanity through its more than 425,000 members in more than 160 countries and its high-impact, highly cited, prestigious publications, conferences, technology standards, and professional and educational activities.



# SECS NEWS **spotlight**

## Bath County High School CyberPatriot Team Wins 1st Place Award in Kentucky

A team of students from Bath County High School in Owingsville, Kentucky recently concluded an exceptional round of competition in the twelfth season of CyberPatriot – the Air Force Association’s National Youth Cyber Defense Competition.

Established by AFA in 2009, CyberPatriot is designed to educate and motivate students toward careers in cybersecurity and other science, technology, engineering and mathematics (STEM) disciplines critical to our nation’s future.

CyberPatriot’s core program – the National Youth Cyber Defense Competition – challenges teams of students across the United States, Canada, and other schools abroad, to find and resolve cybersecurity vulnerabilities in simulated environments. Top teams from the online rounds earn an all-expenses-paid trip to Rockville, Md., for the in-person National Finals Competition, where students compete for national recognition and scholarships.

From 6,760 teams registered for the competition season, the CyberPatriot field is divided into three divisions – the Open Division for public, private, and home school teams; the All Service Division for JROTC, Civil Air Patrol, and Naval Sea Cadet Corps teams; and the Middle School Division for middle school-aged students. Based on the results of two preliminary rounds, CyberPatriot XII high school teams were categorized within their divisions as Platinum, Gold, or Silver Tier teams, with Platinum Tier teams representing the highest scoring teams.

Led by Coach Brian Coleman, the team of students from Bath County High School excelled in the CyberPatriot XII



State Round held in December, demonstrating teamwork, critical thinking, and technical skills needed for a successful career in cybersecurity. The team’s performance earned it Kentucky’s 1st Place Award in the Platinum Tier (the nation’s highest tier) and a spot in the National Semifinal Round held this month.

Coach Coleman states, “I could not be more proud of this year’s team. To achieve such a high level of success in only their second year competing says a lot about their individual and team work ethic and their commitment to striving for excellence.”

Following the Semifinal Round, top teams in the Open and All Service Divisions’ Platinum Tier and the top three Middle School Division teams will advance to the CyberPatriot XII National Finals Competition in Rockville, Md., in March.

More information is available at [www.uscyberpatriot.org](http://www.uscyberpatriot.org) or from the CyberPatriot staff at [info@uscyberpatriot.org](mailto:info@uscyberpatriot.org).

## CPE approves new engineering program at MSU

The Kentucky Council on Postsecondary Education (CPE) has approved a new program at Morehead State, the Bachelor of Science in Systems Integration Engineering (BSSIE).

The first of its kind in the state, the BSSIE program combines science, physics and mathematics courses with hands-on mechanical and electrical engineering classes and labs to give students a robust interdisciplinary education that will prepare them for careers that require advanced systems integration skills.

“The ETM department is well-positioned to offer the Systems Integration Engineering program, with most faculty members having terminal degrees in the engineering disciplines that support this program,” said School of Engineering and Computer Science Associate Dean Dr. Ahmad Zargari.

The program was developed in cooperation with local industries through their participation in MSU’s Engineering and Technology Management Industrial Advisory Board. Comprised of representatives from more than 25 companies in the region, the board guided the creation of the program to meet the needs of industry in the area.

The new degree program will launch in Fall 2020.

For information on programs in Morehead State’s School of Engineering and Computer Science, visit [www.moreheadstate.edu/secs](http://www.moreheadstate.edu/secs), email [secs@moreheadstate.edu](mailto:secs@moreheadstate.edu) or call 606-783-2418.

## ETM Students Achieve 90% Pass Rate on CTM Exam

Morehead State University's Engineering and Technology Management (ETM) fall 2019 graduating class achieved a 90.63% pass rate on the Certified Technology Manager (CTM) Exam.

According to Dr. Ahmad Zargari, associate dean for MSU's School of Engineering and Computer Science, ETM students take the CTM exam before graduation their senior year.

"Based on results from a composite group of over 1,000 examinees from over 20 other organizations, the ATMAE (Association of Technology, Management, and Applied Engineering) Board of Certification chair reports that the historical average national pass rate for the CTM exam is 68.25% and MSU's ETM students earned over 90.63% pass rate in fall 2019," Zargari said. "We are proud of ETM faculty and graduating seniors for their success."

The CTM Exam is nationally administered through the ATMAE to certify graduates of ATMAE-accredited programs.

The Engineering Technology programs have been accredited by ATMAE since 1998, with re-accreditation achieved through 2020.

A minimum score of 95 out of 160 in the categories of Leadership, Self-Management, Systems, Processes, Operations, People, Project, Quality, Risk and Safety is currently required to qualify for certification. CTM is the initial certification status awarded to applicants who meet ATMAE's requirements for certification. CTM certification holders may report continuing education activity to qualify for Certified Senior Technology Manager (CSTM) status. ATMAE Certification recognizes expertise in a specific field, a mark of distinction that sets the certification holder apart while providing external validation of knowledge and competence in the discipline.

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## ETM Hosts 23rd Annual EKTSA Regional Competition

Morehead State University's Department of Engineering and Technology Management was the host of the 23rd annual EKTSA regional competition on Friday, March 6, 2020. TSA chapters brought 184 students, and 16 faculty advisors from Morgan County High School, Rowan County Senior High School, East Carter High School, Fleming County High School, Highlands High School, Bath County High School, Mason County High School, Bryan Station High School and Raceland Worthington Middle and High Schools to participate in different events. The purpose of this event is to prepare and evaluate the participating students' projects before going to the state competition, allowing the students to improve their projects for state competition based on the feedback they receive from MSU faculty and staff.

The event started with the EKTSA student officers, President Gabbi Hill of Bath County High School, Vice-President Jenna Copher of Bath County High School, Secretary Alexa Brunson of Rowan County High School, Sergeant-at-Arms Walker Holman of Raceland-Worthington High School, Treasurer Jayson Bates of Raceland-Worthington High School, and Reporter Grayson Hurst of Fleming County High School, conducting the TSA opening ceremonies. After the opening ceremony, students dispersed to the competition areas in the Adron Doran University Center and the Lloyd Cassity Building to compete in different events. During these competitions, students mingled with their friends and interacted with MSU faculty and staff.

The Highland chapter had an impressive performance capturing 16 different awards including 6 first place, 7 second place, and 3 third place. Raceland-Worthington came in a close second with 15 different awards: 6 first place, 4 second place, and 5 third place ranks. Bath County students won 9 awards: 8 first place and 1 second place. A trio of school finished with 6 total awards: Fleming County pulled in 3 second place and 3 third place awards, Mason County garnered 2 first place, 2 second place and 2 third place awards, and East Carter students finished with three first place, 2 second place, and 1 third place awards. Students from Rowan County won 5 total awards including 3 first place and 2 second place. Bryan Station students finished with 4 awards by placing with 2 first place, 1 second place and 1 third place awards. Mason County received 1 first place, 1 second place, and 1 third place award for a total of 3 awards.

The EKTSA Regional Committee and Student Officers welcomed and gave thanks to two visitors to the competition this year. The group was visited by Mr. Mark Harrell, Engineering Consultant and Director of KYTSA and Andy Stephenson Kentucky TSA State Coordinator both with the Kentucky Department of Education who team judged an event.

The Student Officers offered a special thanks to the faculty and staff (Lieutenant Jarred Hunt and Detective Mike Martin of the MSU Police, Dr. William Grise, Dr. Qingzhou Xu, Dr. Cheng Cheng, Dr. Zhaochao Li, Mr. Asim Chaudhry, Mr. Sam Mason, Mr. Jason Stepp, and Mr. Joe Curd) Graduate Students (Andres Salinas Hernandez, Qing Yu, Meshari Alrajab, Sultan Alsabi, and Ritesh Chakradhar), student volunteers (Brenton Anderson, Kris Longo, Shana Bibee, Andy Buteyn, and Derek Null), and MSU Alumna Lindsay Childs for making this event possible.

The annual conference of the Association of Technology, Management and Applied Engineering will take place November 6 - 8, 2019 at the Sheraton Charlotte Hotel in Charlotte, NC.

The 7th Annual Business & Technology Student Conference was held on Friday, October 25th. at 12:30 pm in the Ballroom on the 3rd Floor of ADUC.

SECS Advisory Board Member Wait Pozgay of GE Appliances was awarded 2019 Alumni of the year at the conferece.

The Department of Engineering and Technology Management will host the annual EK TSA Eastern Regional Competition on Friday, March 6, 2020.

The next SECS Advisory Board meeting will be held on March 27, 2020.

## FOR YOUR INFORMATION



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