Jessica Miller has obtained her PhD degree under the mentorship of Dr. Guruprasad Giridharan and Dr. Tamer Mohamed. She earned a BS in Biomedical Engineering at the University of Alabama at Birmingham prior to enrolling at UofL, during which she was a highly productive researcher in a biomedical engineering research laboratory that focused on cardiac regeneration methods. Her PhD dissertation research focused on establishing cardiac tissue slices as a platform for cardiotoxicity screening and for use in cardio-oncology related research studies. Throughout her PhD, she has published 5 peer-review manuscripts, 3 of which are first author. Jessica will defend her thesis in November, 2022.

Ahmed Naglah, PhD Candidate
Ahmed Naglah is an informatics engineering professional and interdisciplinary Ph.D. candidate with specialty in translational bioengineering. His current research focus is on developing methods for improved bioimage analysis and computational diagnostics. Ahmed received his B.Sc. degree in electrical engineering, electronics and communications engineering from Ain Shams University, Cairo Egypt in 2008. He received his M.Sc. degree in informatics engineering from the Nile University, Cairo, Egypt in 2016. Ahmed worked in industry for 10 years across two multinational companies, Orange and Vodafone, during which he was leading engineering teamwork on cellular network design and informatics. In 2018 he joined the interdisciplinary Ph.D. program at UofL and has been working with Dr. Ayman El-Baz’s BioImaging Lab with research focused on Generative-AI for bioimaging analysis and computational diagnostics. Ahmed will defend his thesis in November, 2022.

Jessica Miller, PhD Candidate
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Jonathan George, PhD Candidate
Jonathan George is a PhD candidate, working in Dr. Thomas Roussel's Bioinstrumentation lab. He earned a BS in Mechanical Engineering at the University of Tennessee at Chattanooga, and prior enrolling at UofL, he spent time at the Center for Advanced Cellular Therapies at the Cardiovascular Innovation Institute. His Ph.D. dissertation research is a collaboration with Dr. Andrea Behrman's pediatric neurorecovery group at Frazier rehab, and focuses on equipment which will help children with spinal cord injuries to extend gains after locomotor training by promoting trunk control, and on detection of muscle activity using machine learning to analyze data from embedded sensors.
Bradley Mahaffey

We asked one of our students, Bradley Mahaffey, about his experiences as a bioengineering student. Bradley is enrolled in the Bioengineering Master of Science program.

1. What prompted you to choose the Bioengineering program?
I entered the MS in Bioengineering in Spring 2022 to continue my career as a researcher from my undergraduate degree and prepare for medical school. I initially enrolled as a non-thesis student, but I became very interested in research and am currently working in Dr. Joseph Chen's laboratory. I chose Bioengineering because it was the best interdisciplinary blend of my undergraduate coursework in physics and biomedical chemistry to further my career.

2. Overall, how do you feel about the program?
The MS program is very comprehensive and gives me a good understanding of new content in an easily digestible way, without slowing down the pace of learning. The parallels of coursework and the lab I work in, is a nice way of seeing the manifestations of learned coursework into physical reality. The faculty are all exceptionally well-versed in their respective areas, and the department activities facilitate interaction and positive networking with undergrads, graduates, and faculty alike.

3. How has the program improved your knowledge and opportunities?
From a knowledge standpoint, I have learned a lot about instrumentation and device operation from the coursework. I have also learned much about cancer, its progression, invasion, and mechanics from my lab experience. The BE department has been a great launchpad for ideas I've had, and for facilitating my future career goals. Of particular interest for new graduate students, the support of the department in submitting a graduate research fellowship application is one of the opportunities that I would like to highlight. The mentorship of faculty and peers alike has warmed me up to the idea of a Ph.D. and whether that is at UofL or elsewhere, I will be a successful investigator due to my engagements and experience in UofL BE.

4. What advice can you impart to potential applicants of the BS program?
For BS students, my best advice is to stick with it and weather the storm. If studying for long hours is the worst you have to endure for a comparatively smooth industry career, then it will be well worth it. Moreover, teamwork with your peers will get you further than trying to solve problems in a bubble. No job in industry has you working entirely alone.
For MS and PhD students, this suggestion goes hand-in-hand with how the program may be improved: do lab rotations and find out what

Cont'd from pg 1, Student Successes

RL! Award Winners in BE
The Department of Bioengineering is pleased to announce that a number of BE students won at the 2022 Research Louisville! conference. The winners are: Center, Ahmed Naglah (Doctoral Eng., 3rd Place), Clockwise from top left, AlHassan Abdelhalim (Undergrad.Eng., 2nd Place), Mary Baxter (Masters Eng., 1st Place), Mariem Andrawes (Undergrad.Eng. 3rd Place), and Lara Hassan (Undergrad.Eng., 1st Place). Congratulations to all who competed and to the winners.

Houchens Prize Winner
Mohamed Nazih Shehata has been awarded the John M. Houchens Prize for most meritorious doctoral dissertation. The dissertation is entitled, Role of Machine Learning in Early Diagnosis of Kidney Diseases. The Houchen's prize is awarded to one doctoral student at the University of Louisville.

Speed School Meets With AIU and Alexandria University
Delegates from UofL's Speed School of Engineering met with AlAlamein International University (AIU) and Alexandria Universities in August to discuss the furthering collaborations and student exchange between the universities. UofL hosted 11 summer undergraduate co-op students from AIU, Mansoura University, and Alexandria University. The students worked in various UofL Speed School and Department of Bioengineering laboratories.
Dr. Ayman El-Baz is a Professor and Chair of the University of Louisville’s Department of Bioengineering. He serves as the director of the BioImaging Laboratory, and is a Distinguished University Scholar. He received his B.S. and M.S. degrees in Electronics and Communications Engineering from Mansoura University, Mansoura, Egypt in 1997 and 2001 respectively, and his Ph.D. in Electrical and Computer Engineering from University of Louisville in 2006. He joined the Department of Bioengineering at the University of Louisville in 2006. His current research focuses on medical image analysis and artificial intelligence in medicine.

Dr. El-Baz has generated over $29 Million in research funding together with his collaborators, including grants from the American Heart Association, Department of Defense (DoD), National Science Foundation (NSF), and National Institutes of Health (NIH) R01, R15, and SBIR mechanisms. He has published 213 journal articles, 53 books, 107 book chapters, 262 peer-reviewed conference papers, and 216 abstracts. He has filed 38 patents and disclosures in addition to 7 software copyrights, has produced 2 tutorials and has given 35 invited talks.

The BioImaging Laboratory, established by Dr. El-Baz in 2006, has a history of collaborating with clinicians, engineers, and industry and has developed and tested several Computer Aided Diagnostic (CAD) systems for the early detection of severe diseases and disorders, including various types of cancer, cardiovascular diseases, brain disorders and kidney failure. Over the past two decades, Dr. El-Baz has established a thriving and internationally recognized research team. His laboratory has been committed to excellence in oncology research and has made several widely recognized, well-funded contributions in the area of medical image analysis. These include innovative and ground-breaking techniques for use in image-guided surgeries, and non-invasive image-based diagnostic systems to facilitate the early diagnosis of different type of cancers. His work is helping to pave the way for upcoming cutting-edge medical systems and has succeeded to establish strong and successful interdisciplinary collaboration with researchers from the following universities: 1) Mansoura University and 2) Assiut University (Egypt), 3) Khalifa University, 4) Dubai University, and 5) Abu Dhabi University (UAE), 6) University of Chicago (USA), and 7) Auckland University (New Zealand). His main collaborative research contributions include development of a new big data-based technology for the early diagnosis and management of cancers of the lung, prostate, kidney, neck, liver, bladder, breast, brain, and spine. His inventions have received commercial interest from several companies to license his technologies, including Siemens Medical Solutions, PulmoCAD Inc., MO, and Johnson & Johnson. In addition, Dr. El-Baz has been involved in establishing BME educational programs overseas and has been instrumental in developing international (2+2) joint dual degree programs with Dubai University in UAE, as well as six universities in Egypt (Alamein International University, Assiut University, Helwan University, Mansoura University, Benha University and Alexandria University). Dr. El-Baz developed a new certificate in Artificial Intelligence in Medicine at UofL.

Dr. El-Baz has a history of mentorship in the field of artificial intelligence in
We have established a student endowment with a goal of raising $200,000 by 2023. Due to the generosity of our donors we have raised approximately $45,000 to date. This has enabled us to present ten new BE student awards this year. We are deeply grateful to all our donors for contributing significant amounts to this cause. Your continued support is vital to fulfilling the endowment objective of recognizing meritorious students. For more information about how your donations can help transform the BE Department, please contact Mark Daily or call (502)852-2400.

Dr. Ayman El-Baz, Chair of UofL and Speed School of Engineering’s Department of Bioengineering, was inducted into the Fellowship of the Biomedical Engineering Society at the 2022 BMES Conference in October. Annually, BMES recognizes individuals for their impactful and notable accomplishments and significant contributions to the Society and the field of Biomedical engineering.

Dr. Ayman El-Baz, presented with BMES Fellowship Award at the 2022 conference in San Antonio.

The tradition of the annual faculty-student basketball game was revived after a 3-year long hiatus due to COVID-19. Surprisingly, BE faculty and staff won all three games against the students, demonstrating age, artificial joints, and experience can still persevere against youth and inexperience.

Patents Awarded in 2022


**Ophthalmic compositions and methods for reducing oxidative damage to an eye lens.** Inventors: Martin O’Toole, Ori Braun, Shlomit Schaal, US11,406,591B2, August 9, 2022.


BE Donations

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Member of the IEEE and serves on the editorial board of 13 journals. Dr. El-Baz served on 21 grant review panels for NIH, NSF, Swiss National Science Foundation (SNSF), Al Jalila Foundation, Sheikh Hamdan Bin Rashid Al Maktoum Award for Medical Science, The King’s Health Partners R&D Challenge Fund, King’s College London, DOD ASEE, and The Michael J. Fox Foundation.

Dr. El-Baz’s noninvasive technology for the early diagnosis of autism in children using MRI scans and artificial intelligence has been licensed and is currently undergoing the process of Food and Drug Administration (FDA) approval. His technology is able to identify malformations in the brain to detect autism within the first year of life, enabling earlier treatment. This research will give investigators and clinicians critical information about the correlation of abnormalities in the brain cortex and certain genome sequences, pinpointing the area of the brain that may experience abnormality. This work will enable determination of the types of functions that may be affected, and intervene at much earlier ages (1-2 years of age), leading to better outcomes in children with autism. Currently, testing and diagnosis of autism cannot be completed until about 4 years of age, delaying therapy.

Dr. El-Baz hopes that all the technologies developed at the BioImaging Laboratory would be translated to clinical use and help patients. He emphasized that solving these challenging issues requires interdisciplinary collaborations and the work done by his lab would not be possible without all the collaborators and expertise from University of Louisville and other universities.