Chair’s Message

Dr. Ayman El-Baz, Professor and Chairperson for the Dept. of Bioengineering

I am excited to share with you some of the activities of our faculty, students, and alumni in this inaugural issue of BEconnected. Our department is experiencing phenomenal growth in both undergraduate and graduate admissions. We welcomed our first batch of Doctoral students this year. Our faculty secured $14.8 M in extramural funding and published 2 books, 53 peer-reviewed journal articles, 22 conference publications, 13 book chapters, and 22 patents and patent disclosures last year. We are delighted to report the addition of Dr. Thomas Roussel and Dr. Jonathan Kopechek to our faculty.

Our students made a real difference in the community by using 3D printing to create a prosthetic hand for a 6-year-old Louisville boy with symbrachydactyly. BMES students repaired medical equipment for shipment to other countries in need. We are very grateful for the support of our donors and alumni. Your contributions have been vital to the success of our students and faculty. We look forward to your continued support and invite you to visit us and see firsthand all the exciting changes in our department. We would love to receive updates from you! Please send your updates to Nancy Hansford at nahans01@louisville.edu.

Student Successes

NCAA Women’s Enhancement Program Postgraduate Scholarship
Katie Nord has been awarded a NCAA Women’s Enhancement Program Postgraduate Scholarship for Careers in Athletics worth $7,500. She was one of 13 women chosen to receive this scholarship. Katie has been admitted to Northwestern University to pursue a Doctorate in Physical Therapy.

Whitaker International Fellow
Young Choi is conducting research on the redesign of a minimally invasive right ventricular assist device (VAD) for the treatment of right-sided heart failure at RWTH Aachen University’s Helmholtz Institute of Applied Medical Engineering (Germany) through a Whitaker International Fellows Award. He holds a Bachelor’s and Master’s degree in bioengineering from the J.B. Speed School of Engineering. Through UofL bioengineering internships, Young has worked on the pre-clinical and clinical testing and development of medical devices for which he holds 7 peer-reviewed publications and a pending patent application.

NCAA Championship Team
Alex Sellers (BE undergraduate student) was part of the 4x100 freestyle relay that placed 4th at the ACC championships. She was selected to be an alternate swimmer of the 2016 NCAA Championship team (March 16-19). In the 4x100 freestyle event, Alex and her three teammates qualified 6th in the morning preliminaries, and placed 7th in the finals with a time of 3:13.21, the fastest in program history, and received NCAA All-America honors. Overall, her team was placed 8th at the championships, which marks the second consecutive year UofL Women’s Swimming & Diving has placed in the Top 10 of the NCAA.

John M. Houchens Prize Winner
Ehsan Hosseini-Asl, holds a Ph.D. in Electrical and Computer Engineering at J.B. Speed School of Engineering, and received the John M. Houchens Prize for the most outstanding dissertation. During his Ph.D., he focused on leveraging machine learning techniques using deep learning for 2D and 3D medical image analysis, in image segmentation, tissue classification and disease diagnosis. He developed an automatic and accurate Computer-Aided Diagnosis system for Alzheimer’s disease using 3D Brain MRI scans. He authored and co-authored six conference papers published in the proceedings and had two papers published in prestigious journals including IEEE Transactions on Neural Networks and Learning Systems and IEEE Transactions on Biomedical Engineering.
BE Welcomes Newest Faculty Members, Dr. Jonathan Kopechek & Dr. Tommy Roussel

Dr. Jonathan Kopechek joined the Bioengineering department as a new assistant professor at UofL beginning April 1st. He received an NIH F32 postdoctoral fellowship at the University of Pittsburgh to develop a therapeutic platform utilizing ultrasound and microbubble-targeted delivery of a microRNA inhibitor to the heart for suppression of cardiac hypertrophy. He plans to build on this work at the University of Louisville by developing novel ultrasound-responsive carriers for targeted delivery of molecular therapeutics.

Dr. Tommy Roussel joined the BE department as a tenure-track assistant professor in July 2015 after holding a term assistant professor position for one year in the department. His current research includes the development of Lab-on-a-Chip systems related to miniaturization of electrochemical analysis techniques, custom instrumentation and control electronics to support the study of wound irrigation in low gravity environments, and the development of locomotor training systems for pediatric patients with spinal cord injuries. He is a founding member of three startup companies created to commercialize technology developed at UofL, including Assenti (Glaucoma), Ultra Trace Detection (explosives detection), and CoulSense (remote heavy metal sensing).

Doctoral Program in Translational Bioengineering

The Department of Bioengineering, in conjunction with School of Interdisciplinary Graduate Studies is pleased to offer a doctoral program in translational bioengineering beginning from 2016. The Ph.D. program is designed to train graduate students with a focus on clinical and translational research as part of a multidisciplinary team in a fast-paced, interdisciplinary research environment. The interdisciplinary program involves Schools of Engineering, Medicine, Dentistry and Business and students specialize in one of the following tracks: traditional bioengineering research, clinical translational research and advancing bioengineering technologies through entrepreneurship. Additional information is available at:

https://louisville.edu/translational-bioengineering

Bioengineering Seminar Series

The Department of Bioengineering is excited to host a weekly seminar series which began in Spring 2016. The hour-long seminars feature distinguished speakers in engineering, science and medicine and provides an ideal opportunity to expose BE students to new ideas and contemporary research. Seminars will be held on Wednesdays from 12:00-1:30PM on the Belknap Campus during the Spring 2017 semester. Seminar information and videos from past seminars are posted at:

https://louisville.edu/speed/bioengineering/seminars

BE Students Create Prosthetic for 6 year-old (pictured at top of cover page)

Students learning about disability challenges in Dr. Gina Bertocci’s graduate Rehab Engineering course were tasked with creating a prosthetic hand for a boy born with symbrachydactyly, a condition causing limb anomalies in his hand. Using open-source software and a 3-D printer, they were able to create several prosthetic prototypes. Within minutes of receiving the prosthetic hand the young boy was able to pick up a ball and begin interacting with fellow students in a game of “catch”. View the video of the announcement on YouTube.

https://www.youtube.com/watch?v=3AK5P9_dZiE

“For us, having the boy with a smile on his face and being able to interact with his classmates — that really makes our day,” Dr. Bertocci said.

Carrie Benzinger, Class of ’12

Near the completion of my Master’s degree, I received two prestigious awards; a Whitaker International Fellows Scholarship and Fulbright Research Scholarship. The opportunities I experienced from these scholarships transformed my engineering career. These scholarships allowed me to travel to Germany and complete research at the Helmholtz Institute of RWTH Aachen University. As part of the total artificial heart project, I assisted in CAD design, observed open heart surgery, and supported animal trials for a new cardiovascular device. I worked with an international team of researchers and gained an appreciation of the worldwide community of bioengineers. I returned to the US in late 2013, and began working at Medtronic Spinal and Biologics in Memphis, TN. I am a product development engineer and work on the design and development of posterior spinal implants. I also serve as the Chair of Medtronic Spinal and Biologics Internal Society of Women Engineers Network, and am a mentor to middle school students for Lego Robotics. My bioengineering Bachelor’s and Master’s degrees from J.B. Speed School provided me with amazing opportunities to see the world and continue to guide me in my career as an engineer in the medical device industry. I will be using all of these experiences to help guide me as continue in my career as an engineer in the medical device industry.

Joel Graham, Class of ’10

I was a freshman with an undecided major when I came across a flyer announcing a new degree in Bioengineering. I attended an introductory meeting and became hooked. I enrolled in the new program my sophomore year, becoming a member of the first graduating class. Early in the program I became interested in bio-devices. I volunteered and worked in Dr. Koenig’s and Dr. Giridharan’s research labs and learned about cardiovascular monitoring systems and devices. This experience led to an internship co-op at Advocate Christ Medical Center under Dr. Slaughter, a cardiovascular surgeon Mr. Michael Sobieski, a perfusionist in the mechanical circulatory support program. The hospital experience and patient interactions instilled in me a passion for the field that I still carry today. Following graduation, I was able to immediately secure a job based on the
Engineer in Bioengineering Award in 2013.

A mentor and mentee program was implemented to help freshmen transition into their college career. Interested students were paired with upperclassmen so that they could receive one-on-one advice about both academic and social interests. Students interested in pursuing a medical degree were also put in contact with current medical students who graduated from the biomedical engineering program. BMES organized MedTech Talks in conjunction with the Engineering in Medicine society at the UofL Medical School to introduce medical students to faculty members at their campus and to give them opportunities to network. The primary objective of this seminar series is the development of medical students’ understanding of how engineering is directly applied in a clinical setting by partnering a physician and an engineer to present these seminars.

Social events such as Student vs. Faculty basketball and volleyball games are organized each year to give students a chance to compete in a friendly competition against the Bioengineering department and to develop professional relationships outside of a classroom setting. Student-Faculty luncheons and a Research Showcase are organized annually to give students a chance to network with professors, graduate students and to learn about the biomedical engineering research currently being conducted at the University of Louisville. Each year, the BMES encourages students and faculty to display their research posters at the showcase to promote interest and excitement of ongoing research within the department. Additionally, a Keynote Speaker is invited each year, in order to give students a chance to ask questions about research, academia and industry.

BMES also takes part in the Engineering Exposition held annually by the Speed School of Engineering Student Council (SSSC). Each year a hands-on activity such as a strawberry DNA extraction is performed for visitors to participate in. Over one hundred K-12 students visited the BMES table at the Spring 2016 Engineering Expo to learn about the biomedical engineering department at the University of Louisville, the Student Chapter of Biomedical Engineering and the positive change that a Bioengineer can bring to the world!

In order to raise money for these events, BMES conducts a pie-in-the-face raffle fundraiser at the annual student-faculty volleyball game. Funding for events is also obtained from University programs such as Club Programming Committee (CPC) and Partnership for Retention Improvement in Mathematics, Engineering and Science (PRIMES). BMES was able to send a group of four students to the National BMES Conference in 2014 and 2015 by obtaining PRIMES funding and the UofL Student Government Association (SGA). Both faculty and select students were chosen to present their research in a seminar or a poster presentation at the conference.

Students are encouraged to become members of the local and national chapter to gain access to events, career development, networking and research discoveries. Becoming a member of the local chapter will allow students to interact with their peers and earn opportunities to help grow the chapter! Monthly meetings are held each semester in addition to special events to inform members of ongoing changes and activities within the University.

If you are interested in joining UofL BMES, please contact us at bmesatuofl@gmail.com. If you wish to learn more about the National Chapter, please visit www.bmes.org.

The following BE faculty received grants and industry contracts totalling $14.8 M in 2015.

1. G. Bertocci - 3 grants (NIJ, Uofl-IRG Foundation), $422K.
2. K. Bertocci – 1 grant (Helmsley Trust), $1.5M
3. A. El-Baz – 3 grants (EXCITE, Coulter), $434K
4. H. Friebues – 5 grants (NIH, NSF, KSEF, Coulter), $90K.
5. G. Giridharan – 4 grants (Coulter, KSTC, AHA, IC), $ 2.1 M.
6. R. Keynton – 2 grants (Coulter, KSTC, AHA, IC), $3.3M
7. S. Koenig – 6 grants (KSTC, AHA, IC, NIJ), $4.1M
8. M. O’Toole – 3 grants (EXCITE, KCF, Coulter), $458K
9. T. Roussel – 2 grants (NASA, Coulter), $363K
10. K. Soucy – 2 grants (AHA, IC), $544K
11. P. Soucy – 1 grant (IRIG), $5K
12. M. Voor – 3 grants (NIAMS, Coulter), $4.3M

Your continued support is vital to the success of our department. You may designate your support towards the BE department, student awards, or to support a specific research lab. For more information about how your donations can help transform the BE Department, please contact Chris Day at chris.day@louisville.edu, or call (502)852-1541.

University of Louisville Chapter of the BioMedical Engineering Society

The UofL Biomedical Engineering Society (BMES) was created to generate interest in the biomedical engineering program and to foster academic, community, and industry relations. Our mission is to provide undergraduate students with the academic and professional resources needed to succeed. The social, professional and volunteer events held by the society are aimed to help bridge the gap between engineering students, medical students, and the BME faculty at University of Louisville while providing an exceptional college experience. In the past two years, the UofL BMES has held many successful events in order to encourage the relationship between undergraduates, graduates and faculty.

BMES paired with a local non-profit organization called Supplies Over Seas so that members can volunteer and acquire hands-on engineering experience. Students are also given the opportunity to learn and seek guidance from the National Quality Manager for Clinical Engineering at Catholic Health Initiatives. Students were given medical devices to repair and perform safety checks so that the equipment can be shipped to countries in need. During one particular visit, students were told that a hospital in Africa had two premature babies but had only one Neonatal Intensive Care Unit (NICU) and were tasked with repairing an urgently needed NICU so that both infants could receive the care they needed. See more on this story on YouTube - https://youtube.com/watch?v=T5GF0MYs4Eg

A mentor and mentee program was implemented to help freshmen transition into their college career. Interested students were paired...
Bioengineering Graduates at UofL

The Bioengineering Department of the University of Louisville is proud to present our graduates of the Bachelor of Science and Master of Bioengineering programs by their years of graduation.

BACHELOR OF SCIENCE

Spring 2009
Ayers Christina
Bachman Daniel
Badder Mark
Cox Emily
Graham Joel
King Benjamin
Mulic Shekhtrovav Ines
Scherzer Christopher
Strotman Lindsay
Wells Erica

Summer 2009
Nitzken Matthew
Fall 2009
Husrell Timothy
King Kenny
Rangi Harkina

Spring 2010
Elliott Holly
Grossman Samuel
Hoblittez Patrick
Ising Mickey
Kumar Adwait
Osborne Christopher
Scherzer Christopher
Warren Sean
White Joshua

Summer 2010
Burkehead Thomas
Mindel Thomas
Mueng Edward
Patel Dhrurvikumar

Fall 2010
Canfield Nicholas
Clarkson Cortney
Henry Benjamin

Spring 2011
Allen Lauren
Bajaj Nihit
Baumann Daniel
Benzerger Carrie
Donaldson Katherine
Fligor Ruthie
Gross Eric
Hillard Brent
Mann Megan
McIlhany Jr Patrick
Sandoval Melissa
Schworer Adam
Seibt Erik
Stephens Dennis
Stewart Daniel
Tran Phuong
Walsh Meredith

Summer 2011
Anderson Mark
Awadallah Ahamed
Brun Grace
Hamilton Mary
Khouri Farhad
Wolsey Chase
Young Caitlin

Fall 2011
Clemans Zachary
Guetherer Jacob
Owens Kirsten
Stratton Jacob
Thompson Adam
Wilkey Shannon

Spring 2012
Abel Danielle
Ainsert Andrew
Buller Mitchell
Chandell Sahiba
Clark Michael
Cummins Jaclyn
Faulkner Brett
Holley Kevin
Humphrey Morgan
Jacobs Michael
James Curtis
Nalley Brittany
Page Amanda
Phillips Jeremy
Priest Thomas
Russell Zachary
Scavoella Adam
Smith Erin
Smith Kristyn
Woodruff DeVonnah
Zimmerman Sally

Summer 2012
Chen Timothy
Christian Marci
Goderius Nathan

Fall 2012
Bell Alexander
Goderius Joshua
Ninhau Aaron
Zoeller Keith

Spring 2013
Brann Tyler
Bugg Amy
Das Evan
Hoswell Justin
Iain Ishita
McClare Patrick
Miles Stephanie
Rostovsky Rea
Ryan Olivia
Stevens Laura
Swarbrook Laura
Tran Minh Nhu
Venaard Matthew

Summer 2013
Alston David
Guller Brian
Gosnell Eric
Hendry Marie
Hufford Troy
Knopp Nicole
Scherzer Michael

Fall 2013
Clauson Laura
Hough Steven
Johnson Billie
Peretve Blossom
Rosenbauer Erin

Spring 2014
Baumann Bryan
Hagan David
LaManzano Tristen
Langrave John
Leadingham Caleb
Manning Samantha
Miles Erin
Morris Brandon
Smith Benjamin
States Gregory
Tennill Thomas

Summer 2014
Lancaster Kevin
McCollam William
Roetgers Allison
Sheilds Garrett
Spalding Thomas
Stepp Chad
Turner Prudence
Usher Clayton

Fall 2014
Cahill Benjamin
Choi Young
Conrad Julie
Conway Cameron
Miller Camden
Scott III Stuart
Wainwright Grace

Spring 2015
Ackermann III Richard
Allen Nicholas
Buchanan Matthew
Deis John
Dillery Melissa
Goessling Holly
Harrell Lauren
Jeffers Marcus
Johnson Timothy
Martin Emily
McKinsey Keyston
McQuade Jessica
Phillips Dustin
Pitcock Meagan
Rapsone Katlin
Rauch Winston
Wimmer Chelsea
Zegarra Daniel

Summer 2015
Black Katilyn
Carnahan Stephen
Hooper Alyssa
Kninney Kelley
Leereh (Stuah) Heather
Montgomery Christopher
Schererer Katelyn
Sliter Eric
Topolsky Nathalie
Valladalo Laura

Fall 2015
Curtis Louis
Gebru Yitzhak
Stone Owen

Spring 2016
Bailer Ryan
Coyle Sean
DeCarlo Alexandra
Fusqua Joshua
Gain Michael
Kelsey Matthew
King Nicholas
Lunts Gordon
Mitchell William
Murphy Ryan
Nassar Elias
North Kathleen
Raque Samuel
Sheel Bryce
Tran Kevin
Waldecker Dakota
Wanring Allison

Summer 2016
Wade Abigail

MASTER OF ENGINEERING

Spring 2010
Grossman Samuel
Harrell Timothy
Strotman Lindsay
Wells Erica

Summer 2010
Nitzken Matthew

Fall 2010
Cox Emily
Graham Joel

Spring 2011
Ayres Christina
Elliott Holly
Carnahan Stephen

Summer 2011
Henry Benjamin
Ising Mickey
King Kenny
Kumar Adwait
Scherzer Christopher
Warren Sean

Fall 2011
Fugur Ruth
Malic Shekhtrovav Ines

Spring 2012
Abel Danielie
Benzerger Carrie
Cummins Jaclyn
Gross Eric
Hillard Brent
McIlhany Jr Patrick
Stewart Daniel
Walsh Meredith

Summer 2012
Anderson Mark
Bajaj Nihit
Baumann Daniel
Burkehead Thomas
Hamilton Mary
Hoblittez Patrick
Khosravi Farhad
King Benjamin
Mueng Edward

Owens Kirsten
Sandoval Melissa
Wolsey Chase

Fall 2012
Faulkner Britt
Nalley Brittany
Page Amanda
Patel Dhrurvikumar
Smith Kristyn

Spring 2013
Ainsert Andrew
Bell Alexander
Howell Justin
James Curtis
Priest Thomas
Selit Erik

Summer 2013
Bugg Amy
Buller Mitchell
Clark Michael
Goderius Joshua
Phillips Jeremy
Russell Zachary
Smith Erin
Tran Minh Nhu
Zimmerman Sally

Fall 2013
Clemans Zachary
Goderius Nathan
Holley Kevin
Scavoella Adam
Stratton Jacob
White Joshua
Zoeller Keith

Spring 2014
Alston David
Humphrey Morgan
Jacobs Michael
Jain Ishita
LaManzano Tristen
Osborne Christopher
Ryan Olivia
Speaker Lauren
Venaard Matthew

Summer 2014
Brann Tyler
Hendry Marie
Siers Laura

Fall 2014
Johnson Billie
Miller Camden
Rosenbauer Erin

Spring 2015
Johnson Billie
Miller Camden
Rosenbauer Erin

Summer 2015
Morris Brandon
Scherzer Michael
Schworer Adam
Wainwright Grace

Fall 2015
Lancaster Kevin
Scott III Stuart
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Choi Young
Curis Louis
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Knopp Nicole
McQuade Jessica
Phillips Dustin
Rapoport Kaarin
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