New Faculty: Assistant Professors

Chengbo Ai (CEE): Sustainable sensing-based systems. His research focuses on the design, engineering, and analysis of sensor and communication networks that will be housed in specially outfitted facilities. The BME program has been awarded about $14 million in research funding including $1.4 million in current support. The BME program will house a faculty of 10 full time and more than 20 faculty members.

Chen Wang (ChE): Immune-Engineering.

Tingyi “Leo” Liu (ChE): Immune-Engineering.

Yeonsik Noh (ECE and College of Nursing): Smart healthcare systems with a focus on the musculoskeletal system. Her research is in the area of analytical and experimental biomechanics, with a focus on the musculoskeletal system. As a principal investigator, she has been awarded about $14 million in research funding including $1.4 million in current support. The BME program has been awarded about $14 million in research funding including $1.4 million in current support. The BME program will house a faculty of 10 full time and more than 20 faculty members.

Tianming “Tim” Xue (ECE): Nanowire-based bioelectronic/biomedical systems based on sensor and communication networks. His research focuses on the design, engineering, and analysis of sensor and communication networks.

Publication Highlight
Qianguo Xia and J. Joshua Yang (ECE) head up a multidisciplinary, 24-person international team of researchers that published six defining papers on neuromorphic computing this year. In the June 2018 Nature Communications, they prove their memristor neural network, which mimics neuro-biological architectures, is ready for machine-learning applications.

Academic Degrees

Industrial Engineering

Materials Engineering

Chemical Engineering (MS, PhD)

Civil Engineering (MS, PhD)

Mechanical Engineering (MS, PhD)

Computer Engineering (PhD)

Electrical Engineering (MS, PhD)

Environmental Engineering (MS, PhD)

Engineering Management (MS, PhD)

Mathematics (MS, PhD)

Pharmacology (PhD)

Physics (PhD)

Sociology (PhD)

Communications (MS, PhD)

Economics (PhD)

Business Administration (PhD)

Electrical Engineering (PhD)


collegeofengineering.umass.edu/fiscalyear2018-deanreport
OUTSTANDING ALUMNI AWARDS

2017/18 recipients of the College of Engineering Outstanding Senior Alumni Award were: Jon J. Dietch ‘69, 74MS (CEE); Ellen J. Ferrara ’89, ‘99PhD (ECE); Spyros Michal ‘08MS, ‘19MS (ME); Karin Rotem ‘99PhD (ChE).

2017/18 recipients of the College of Engineering Outstanding Junior Alumni Award: Marnie A. Bonner ’09 (ME); Dawn T. Eriksen-Stapleton ’07 (CEE); Yong Liu ’02PhD (MIE); and Heather A. Rothenberg ’03MS, ’09PhD (MIE). 

Security

Daniel Holcomb (ECE) was awarded a five-year, $596,160 CAREER Award from the National Science Foundation to study the complete attack and defense of the integrated circuit supply chain. His work develops techniques to address threats in the production and distribution of electronic parts in support of keeping critical electronic systems free from counterfeit parts and embedded hardware Trojans that could compromise their reliability or intended function.

Hossein Pishva-Nik and Dennis Goetsch (ECE) received a $1 million grant from the NSF to study the protection of user privacy in the Internet of Things (IoT). As a key feature of the IoT is that it adapts to the characteristics of an individual user, but the data necessary for this adaptation can allow a user’s location, medical information, everyday habits, etc., to be leaked. This project looks at how the user’s experience can be enhanced while still provably protecting their privacy.

Healthcare

Yubing Sun and Byung Kim (MIE) are developing a novel system for multi-faceted detection of pancreatic biomarkers CA19-9, NSE, and MUC1 as an early warning diagnostic platform for the initial stages of pancreatic cancer. Pancreatic cancer remains one of the most deadly cancers, mainly due to a lack of early symptoms in patients.

Jennifer Schillman and Sarah Perry (ChE) have received an NSF grant to develop nanofiber fabrics that are environmentally friendly and that can absorb polymers that assemble to form highly stable fibers from a solution of water and salt. The resulting tissue-paper-like materials could be used for water treatment, cleaning chemically spilled, delivering pesticides to crops, or in food processing industry to detect with spoil or contain harmful bacteria.

Making low-power optoelectronic devices smaller and faster is the goal of Ashwin Ramabrahmanam and his fellow researchers. In the emerging field of two-dimensional (2-D) materials research, graphene and other electronegative materials comprises. Many sheets that are just a few atoms thick at the benefit of keeping critical electronic systems free from counterfeit parts and embedded hardware Trojans that could compromise their reliability or intended function.

DeAnna Robear ’15 (MIE) received the 2018 Senior Alumni Award for outstanding professional performance and commitment to the College.

Sustainable Water

Cullen Ghassem (ECE) was awarded two prestigious awards from the National Science Foundation CAREER award and the NASA New Investigator Program award. Combined, they provide over $800,000 in research funding over the next five years. Ghassem is studying how Arctic rivers flow as they respond to changes in climate. Using fieldwork from north of the Arctic Circle, data from NASA satellites, and improvements to open-source global hydrology models, he seeks a better understanding of the entire hydrologic system and how it functions.

Reactive Materials

Ashish Kulkarni and Byung Kim (MIE) are developing a novel system for multi-faceted detection of pancreatic biomarkers CA19-9, NSE, and MUC1 as an early warning diagnostic platform for the initial stages of pancreatic cancer. Pancreatic cancer remains one of the most deadly cancers, mainly due to a lack of early symptoms in patients.

Ashok Kulkarni (ChE) was named a “Talented 12” rising all-star by Chemical Engineering News. He has engineered a self-assembled nanomaterial that can tune-emissive suppressive macrophotographs to class A-1 laser-damage-resistant cancer cells. Macrophages are nature immune cells that respond to pathogens such as bacteria and viruses in the body but can be subverted by cancer cells to suppress the body’s immune response to cancer, or to even help tumors grow.

Joel Alvarez (MIE) working with the Rockefeller Foundation-World Bank freshwater resilience partnership to bring specific improvements to water resource systems toward sustainability and a future of change.

1,000+ STUDENTS...

Attended the 37-hour HackUMass – a STUDENT-RUN hackathon that generates impressive software projects and provides all the tools needed to create awesome hardware hacks.

$30,000...

Was awarded to PhD candidate Alexander Smith (MIE) for the 2018 UMass Innovation Challenge for his start-up, e-Biologics, and its wearable patch that continuously and non-invasively analyzes sweat using diagnostic protein nanowires that measure biomarkers of disease.

12 DAYS...

Of volunteer work in the aftermath of Hurricane Maria by undergrads Bryan Chua ’19 ChE (left), Nicolas Duenas ’18 ChE (right), and Ricardo Valtierra ’18 (CEE) (center), who raised funds to carry out an extensive campaign of water purification in the least-reached Puerto Rican communities of Cidra, Jayuya, and Yabucoa.

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Student Experiences

Interims, co-ops, research, study abroad, competitions & service learning.

80% of students participate in experiential learning opportunities.

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STUDENT EXPERIENCES

undergrads Bryan Chua ’19 ChE (left), Nicolas Duenas ’18 ECE (right) of volunteer work in the aftermath of Hurricane Maria by tools needed to create awesome hardware hacks.

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Sustainable Water

Decor Glawason (ECE) was awarded two prestigious grants from the National Science Foundation CAREER award and the NASA New Investigator Program award. Combined, they provide over $800,000 in research funding over the next five years. Glawason is studying bellwether Arctic river flows how they respond to changes in climate. Using fieldwork from north of the Arctic Circle, data from NASA satellites, and improvements to open-source global hydrology models, he seeks a better understanding of the entire hydrologic system and how it functions.

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Engineering change in the world

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Revolutionary Materials

Making low-power optoelectronic devices smaller and faster is the goal of Ashwin Ramasubramaniam (MIE) and his fellow researchers. In the emerging field of two-dimensional (2D) materials, researchers can deposit high-quality, electronic materials/components with sheets that are just a few atoms thick at most. The team is exploring how 2D materials can be used to perform new kinds of electronic operations that can improve the physical and the electronic properties at specific locations. Their techniques would allow for inexpensive, large scale fabrication of electronic and optical devices within single sheets of 2-D materials.
Publication Highlights

Qiangfei Xia and J. Joshua Yang (ECE) head up a multidisciplinary, 24-person international team of researchers that published six defining papers on neuromorphic computing this year. In the June 2018 Nature Communications, they prove their memristor neural network, which mimics neuro-biological architectures, is ready for machine-learning applications.

At a Glance

New Faculty: Assistant Professors

Lixin Gao (ECE) was selected to N2 Women’s exclusive 2017 list of “Stars in Computer Networking and Communications.”

Kara Peterman (CEE) received the prestigious Norman Medal from the American Society of Civil Engineers.

Yeonsik Noh (MIE): Micro and nano manufacturing, personalized medical devices; bio-inspired soft robotics

Ashish Kulkarni (ChE): Immune-Engineering medical devices

Xian Du (MIE): High-resolution, large-area, and fast-speed machine vision and pattern recognition technologies for manufacturing and transportation infrastructure systems

Peter Beltramo (ChE): Soft matter and biological physics; engineering interfacial phenomena central to biology and colloid science

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Tammy Haut Donahue (CEE) has arrived as the founding department head of Biomedical Engineering. Her research is in the area of analytical and experimental biomechanics, with a focus on the musculoskeletal system. As a principal investigator, she has been awarded about $14 million in research funding including $1.4 million in current support. The BME program will be housed in specially outfitted labs and offices on the sixth floor of the new Life Sciences building.

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Tammy Haut Donahue has arrived as the founding department head of Biomedical Engineering. Her research is in the area of analytical and experimental biomechanics, with a focus on the musculoskeletal system. As a principal investigator, she has been awarded more than $14 million in research funding including $1.4 million in current support. The BME program will be housed in specially outfitted labs and offices on the sixth floor of the new Life Sciences building.

At a Glance

<table>
<thead>
<tr>
<th>STUDENTS</th>
<th>2017-2018</th>
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<tbody>
<tr>
<td>Graduate</td>
<td>1,996</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>5,433</td>
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| FUNDING RAISED FY 2018 | Total $10.5M |

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<tr>
<th>LEADERSHIP</th>
<th>3%</th>
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<tbody>
<tr>
<td>$5.5M</td>
<td>$1.4M</td>
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<tr>
<th>RESEARCH</th>
<th>Total $18.8M</th>
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<tr>
<td>$12.2M</td>
<td>$6.6M</td>
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<table>
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<tr>
<th>Percentage</th>
<th>Student</th>
<th>Research</th>
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<tbody>
<tr>
<td>41%</td>
<td>3%</td>
<td>52%</td>
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<tr>
<th>Sources FY18 ($MM)</th>
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<tbody>
<tr>
<td>FY18 ($10.7M)</td>
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<tr>
<td>FY18 ($5.5M)</td>
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<table>
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<tr>
<th>Degrees Awarded 2017–2018</th>
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<tbody>
<tr>
<td>Bachelor’s: 454</td>
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<tr>
<td>Master’s: 122</td>
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<tr>
<td>Doctorate: 32</td>
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<table>
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<tr>
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<tbody>
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<tr>
<td>Nanomaterials Engineering (MS, PhD)</td>
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<tr>
<td>Chemical Engineering (MS, PhD)</td>
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<tr>
<td>Civil Engineering (MS, PhD)</td>
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<td>Engineering Management (MS)</td>
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<td>Environmental Engineering (MS)</td>
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<tr>
<td>Industrial Engineering (MS, MS, PhD)</td>
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<tr>
<td>Mechanical Engineering (MS, MS, PhD)</td>
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<table>
<thead>
<tr>
<th>CONTINUING &amp; PROFESSIONAL EDUCATION DEGREES</th>
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<tbody>
<tr>
<td>Engineering Management, Integrated Field Degree in Electrical and Computer Engineering</td>
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<table>
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<tr>
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<tr>
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