University at Buffalo
School of Engineering and Applied Sciences

Here IS HOW

We make the future

Tremendous synergy and creative excitement have pulled team members together from the different disciplines across campus to focus on topics that will have far-reaching implications for society in the coming decades.

- Liesl Folks, PhD, MBA
Dean, School of Engineering and Applied Sciences

We are living in a veritable sea of data these days, allowing us to access information at unprecedented rates, and permitting better decisions to be made on a myriad of critical topics.

A quick survey of the **new research** and the **new academic programs** that the School of Engineering and Applied Sciences has launched this year illustrates that everything we do now is informed by data and data analytics.

Knowing that this is the world that our students are launching into, we have developed **new targeted graduate programs** that emphasize digital literacy. These programs have rapidly filled to capacity, indicating that our students know that these skills are going to be highly valued in their lifetimes.

One of the great advantages of research and development that incorporates data analytics is that it draws together **new interdisciplinary teams**. In these pages, you will read about large teams working on autonomous transportation, innovative materials advances, and advanced manufacturing.

As we hire **new faculty and staff**, we are targeting those who are excited to expand beyond their discipline boundaries to make the largest impacts possible through partnerships. With this emphasis, we are confident that UB is well positioned to lead the way on high-impact topics.

To support these new ways of working, we need to be nimble in moving people and equipment into new configurations to support research and its active learning components. To that end, we have engaged our **many wonderful donors** to support the renovations of labs and classrooms throughout our school.

As we celebrate our first 70 years as New York State's premier public school of engineering and applied sciences, we look forward to graduating students who are equipped with the knowledge they will need to tackle the biggest problems we face, regionally, nationally and across the world.

Thank you engineering partners!

GOLD PARTNERS

ASCENT AEROSPACE GEMCOR

ATTO
The Power Behind the Storage

DRESSER-RAND
A Siemens Business

LOCKHEED MARTIN

MOOG

nationalgrid
HERE WITH YOU. HERE FOR YOU.

NORTHROP GRUMMAN

PRAXAIR
Making our planet more productive

UNIFRAX

U&S SERVICES
Your buildings. Our solutions.

valuecentric

ZODIAC AEROSPACE

SILVER PARTNERS

Apple Rubber

EDWARDS

LAFARGE

LPCiminelli
Integrity and ingenuity at work

NIAGARA
SPECIALTY METALS

SEABURY APG
AIRLINE PLANNING

FACULTY New

DEPARTMENT OF CIVIL, STRUCTURAL AND ENVIRONMENTAL ENGINEERING

Sustainability

"I'm interested in the dynamics of flow and transport processes in waterway systems, and how these dynamics relate to storm water management."

- Zhenduo Zhu
PhD, University of Illinois at Urbana-Champaign

Clean Waterways

"I investigate the sources and fate of bacterial contaminants in coastal waters."

- Lauren Sassoubre
PhD, Stanford University

Water Quality

"My research focuses on developing innovative nanoscale materials to deliver safe drinking water."

- Nirupam Aich
PhD, University of Texas, Austin

Geoenvironmental Engineering

"My goal is to develop tools and technologies to store seasonal energy and water for domestic use with minimal environmental impacts."

- Kamelia Atefi Monfared
PhD, University of Waterloo

Resilience

"My work investigates the behavior and design of buildings for fire scenarios considering uncertainties, and resilience of a community after an extreme event such as post-earthquake fires or wildfire."

- Negar Elhami Khorasani
PhD, Princeton University

DEPARTMENT OF ELECTRICAL ENGINEERING

Power Electronics

"My research area is low-power data conversion from analog to digital by using time-based signal processing. This is particularly relevant for the Internet of Things."

- Arindam Sanyal
PhD, University of Texas at Austin

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Cybersecurity and Privacy

"My research focuses on developing methods and software tools to enable the collection and analysis of data without compromising the privacy of the data subjects."

- Marco Gaboardi
PhD, University of Torino and National Polytechnic Institute of Lorraine

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

Intelligent Systems

"My research focuses on computational methodologies that are inspired by the wonders of nature, such as evolution, animal-swarm behavior, and how birds learn to fly – targeted towards designing complex intelligent systems that overwhelm traditional engineering-design principles."

- Souma Chowdhury
PhD, Rensselaer Polytechnic Institute

DEPARTMENT OF BIOMEDICAL ENGINEERING

Biotechnologies

"My research work in neurotechnology, motor rehabilitation, clinical neurophysiology and cerebrovascular medicine is focused on developing technologies to treat, cure and even prevent neurological disorders."

- Anirban Dutta
PhD, Case Western Reserve University

DEPARTMENT OF CHEMICAL AND BIOLOGICAL ENGINEERING

Harnessing the Power of Stem Cells

"I am investigating how to engineer organs from stem cells, how to model and image the disease processes with stem cells, and how to image stem cell functions inside the body – leading to engineered products that will advance health and biomedicine."

- Natesh Parashurama
MD, University at Buffalo,

DEPARTMENT OF MATERIALS DESIGN AND INNOVATION

Nanomaterials

"My research and innovations to date have had great impact on information and communication technologies, national security, and energy conversion, transmission, and storage."

- Quanxi Jia
PhD, University at Buffalo

New Materials

"My research aims to fill the gap between flat electronic devices and human body mismatches by developing flexible, low-dimensional single crystalline semiconductor nanosheets."

- Jung-Hun Seo
PhD, University of Wisconsin-Madison

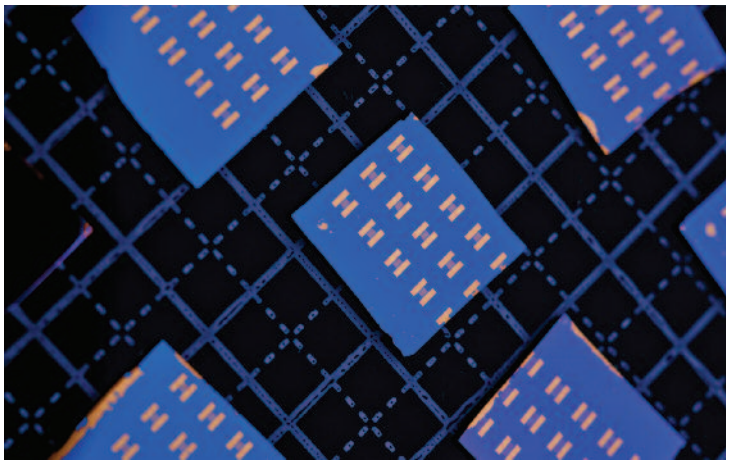
Materials Informatics

"By extracting physics-based correlations from large computational and experimental data spaces, I develop high-throughput models that expand the material knowledge base."

- Scott Broderick
PhD, Iowa State University

AREAS OF FOCUS

Now



Advancing the hunt for new materials

Toyota Research Institute (TRI) has awarded UB's Department of Materials Design and Innovation (MDI) $2.4 million for materials science research that is critical to make next generation carbon-neutral autonomous vehicles. It complements other major grants MDI has garnered in its inaugural year that support its novel programs in linking experimental and computational materials engineering through the tools of materials informatics. This includes the Materials Data Engineering Laboratory at UB (MaDE @UB), funded by the National Science Foundation last fall, which converts data repositories into data "laboratories" to accelerate the prediction of new materials and processes. MDI is a collaboration between the College of Arts and Sciences and the School of Engineering and Applied Sciences.

Harnessing big data to improve transportation

A new platform to test and evaluate self-driving and connected cars is underway at UB with a $1.7 million grant from the National Science Foundation's Major Research Instrument Program. In partnership with Carnegie Mellon University, Cisco and Southwest Research Institute, UB researchers are developing an integrated five-in-one instrument for Connected and Autonomous Vehicle Evaluation and Experimentation (iCAVE2). The instrument is the first of its kind, bridging the gap between existing simulators and road testing facilities. It is particularly suitable for answering various "what-if" questions arising from human-automation interactions with not-yet-available technologies and rare/extreme events such as severe weather or emergency situations. The project is led by the Department of Computer Science and Engineering and includes faculty from across UB.

Educating the work force of the future

In response to the need for engineers with specialized skills, we have created several new graduate programs in high growth areas.

Advanced Manufacturing
Advanced Graduate Certificate
A collaboration between the Departments of Industrial and Systems Engineering and Mechanical and Aerospace Engineering
engineering.buffalo.edu/advanced-manufacturing

Computational Data-enabled Science and Engineering
PhD program
A collaboration between the School of Engineering and Applied Sciences, College of Arts and Sciences, School of Pharmacy and Pharmaceutical Sciences, School of Public Health and Health Sciences, and School of Management
buffalo.edu/cdse

Data and Information Fusion
Industrial Engineering ME (online)
A collaboration between the Departments of Industrial and Systems Engineering and Mechanical and Aerospace Engineering and the Center for Multisource Information Fusion
engineering.buffalo.edu/data-fusion

Data Sciences
Engineering Science MS
A collaboration between the School of Engineering and Applied Sciences and School of Public Health and Health Professions
engineering.buffalo.edu/data-sciences

Sustainable Transportation and Logistics
MS program
A collaboration between the School of Engineering and Applied Sciences and School of Management
buffalo.edu/istl

Numbers AT A GLANCE

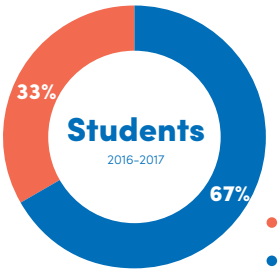
63rd best
undergraduate school
61st best
graduate school
(US News & World Report, 2016)

210
Full-time faculty

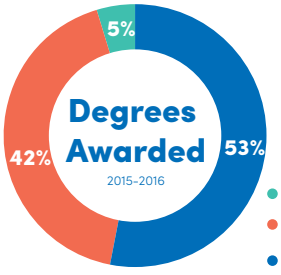
$59,000,000
in research expenditures

57 Fellows
among current faculty;
7 named in 2016 and 2017

35
National Science Foundation
CAREER awards among current faculty;
8 new awards in 2016 and 2017



- 1,859 Graduate
- 3,746 Undergraduate



- 76 Doctorates
- 705 Master's
- 889 Bachelor's

146
Delta Society members
(Fiscal Year 2015-2016)

$3,700,000+ million
in gifts and pledges
(Fiscal Year 2015-2016)

32,000+ alumni
in 50 states and 70 countries

The best public universities have the strongest private support.

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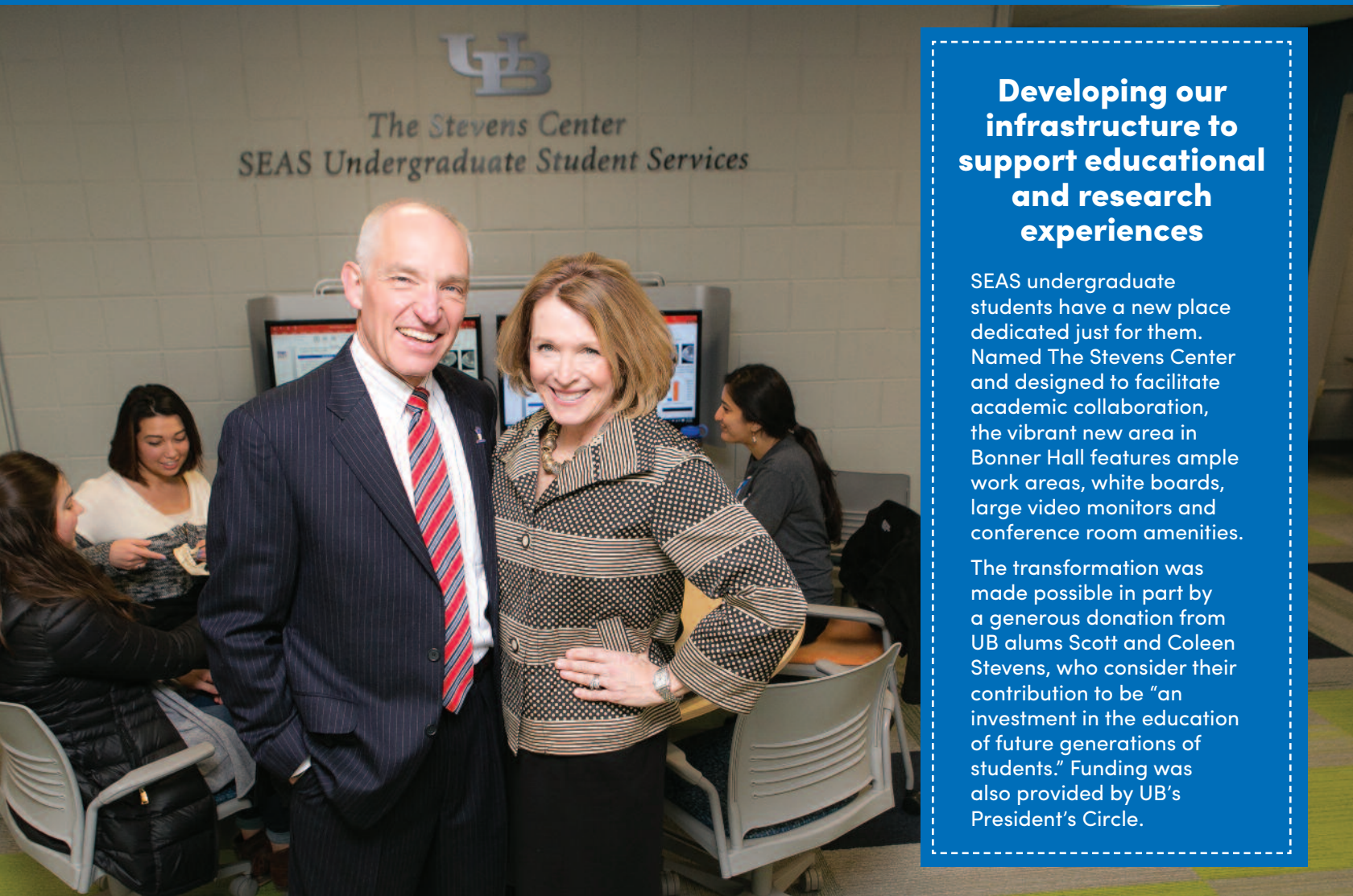

Developing our infrastructure to support educational and research experiences

SEAS undergraduate students have a new place dedicated just for them. Named The Stevens Center and designed to facilitate academic collaboration, the vibrant new area in Bonner Hall features ample work areas, white boards, large video monitors and conference room amenities.

The transformation was made possible in part by a generous donation from UB alums Scott and Coleen Stevens, who consider their contribution to be "an investment in the education of future generations of students." Funding was also provided by UB's President's Circle.