2018-2019

CENTER FOR ENTREPRENEURSHIP
The 2018-2019 academic year has been another record setting time for the Center for Entrepreneurship and for the entrepreneurial community across the University of Michigan. This year, the Princeton Review named the University of Michigan the #1 undergraduate entrepreneurship program in the United States. There were many factors that contributed to this ranking, but in my view, there are three that make U-M unique.

Our Students: 15% of all U-M undergraduate students now engage with the innovation and entrepreneurship ecosystem during their time in Ann Arbor.

Our Instructors: CFE continues its commitment to use practicing entrepreneurs to teach entrepreneurship.

Our Diversity: With strong programs in a variety of disciplines, the richness of opportunities to engage in entrepreneurship at U-M is unprecedented.

The #1 ranking was a major headline for the center this year and it reflects the collaborative, broad and diverse nature of our programs and entrepreneurship across U-M. While all of these programs contributed to this success, the following are examples of major impact in each of our pillars over the last year.

Educate Broadly: Student enrollment in CFE courses climbed to a record number of 2,585 students. This represents a 93.5% five-year enrollment increase.

Tech Commercialization: Michigan Biomedical Venture Fund portfolio company Brio Device received a $1.2 million Phase 2 Small Business Investigational (SBIR) grant to develop a neonate-size endotracheal tube insertion guide offering visualization capabilities incorporated into an articulating stylet for intubation. They are currently raising $3 million in a Series A financing.

Immersive Experiences: Mcity company partner Carmera joined forces with Toyota to utilize 3D mapping technology that was developed while Carmera was mentoring a team of TechLab at Mcity students. This technology is now used in Carmera’s production software and is utilized Toyota vehicles. Carmera also raised an additional $20 million in funding during the company’s collaboration with TechLab at Mcity.

It has been another amazing year at the Center for Entrepreneurship. Thank you to everyone who supported us, and we look forward to working with all of you in the future.

Jonathan Fay
Dixon and Carol Doll Executive Director
THE CFE

WHAT WE DO

The center seeks to instill the following in all of its participants:
Opportunity Identification • Leverage Technology
Experimentation • Relationship Building
Risk Management • Perseverance

The mission of the Center for Entrepreneurship (CFE) is to inspire and transform the Michigan community into entrepreneurial thinkers and doers. The CFE is an innovation hub where ideas, people, resources, and technology meet and create the future. We provide active learning experiences to all students and faculty at the University through classes and programs that are designed to teach the skills needed to successfully translate high-potential projects and ideas into the world. In learning these skills, individuals become better prepared to identify and act on opportunities to solve problems in any organization, or entrepreneurial endeavor.

All CFE programs are designed to promote ethical leadership:

With great talents and influence comes great responsibility. Michigan Engineering seeks to improve the quality of life by developing intellectually curious and socially conscious minds, creating collaborative solutions to societal problems, and promoting an inclusive and innovative community of service for the common good.

WHY WE NEED ENTREPRENEURIAL THINKERS

Mobility - The transportation of goods and people in all contexts will be transformed by autonomous technologies.

Climate - The prosperity of the human race will be altered significantly if we do not mitigate and transform our materials and energy usage.

Healthcare - With aging and growing populations, we need to find cost effective ways of delivering high quality, accessible care.

Security - Technology has become ubiquitous. This presents new challenges for ensuring the safety and security of the global community.

HOW EACH PILLAR SUPPORTS OUR MISSION

EDUCATION

Inspire the Michigan Community to tackle the world’s most pressing challenges by providing broad access to the best entrepreneurship curriculum and experiences that enable students to develop and apply an entrepreneurial mindset in their career.

IMMERSIVE EXPERIENCES

Transform the most entrepreneurial students from across the University of Michigan into entrepreneurial leaders and innovators by providing immersive experiences, focused training, and deep connections to Michigan’s global innovator network.

FACULTY/RESEARCH

To meet these challenges, it is essential to provide an experiential education to engineers in academia, industry and society, so they enhance deep technical excellence with creativity, industrial-awareness, and skills in innovation necessary to see their solutions implemented.
Since its inception in FY 2008, the Center has developed a rich and diverse set of offerings that cater first to the needs of the students and faculty at the University. Just like a startup, it continues to evolve and grow to meet the increasing demand for entrepreneurial curriculum and experiences.

As a part of the U-M College of Engineering, we seek to serve the people of Michigan and the world through preeminence in creating, communicating, preserving and applying knowledge, art and academic values, and in developing leaders and citizens who will challenge the present and enrich the future. 

**WHO WE SERVE**

**Undergraduates ● Graduates ● Faculty ● Researchers**
Student enrollment in CFE courses climbed to a record number of 2,585 students, of which 1,383 were engineering students. This represents a 7.3% year-over-year enrollment increase and a 93.5% five year enrollment increase.

Enrollment in CFE courses include students from all 19 schools and colleges across U-M, in addition to all engineering degrees and majors. The CFE contributes more courses to the campus-wide minor in entrepreneurship than any other unit on campus with 21 ENTR course sections.

CFE’s courses are open to all students in all schools and colleges, freshmen through Ph.D. candidates. Leading our courses are founders, practitioners and innovative entrepreneurs with real-world experience. Their expertise and embodiment of the CFE’s themes of "Try, Fail, Risk, Do" offers unparalleled insight and provides an advantage for Michigan students marketing themselves after graduation.

CFE’s courses also contribute to the University’s 15-credit minor in entrepreneurship. This minor equips undergraduate students from any background or area of study with the necessary skills and experience to translate their ideas into real impact. Over one-third of classes that count toward this campus-wide minor are taught by the CFE.

The Graduate Certificate in Innovation & Entrepreneurship is a 12-credit program open to currently-enrolled, degree-seeking master’s, Ph.D. and professional students from all schools and colleges across U-M and U-M medical residents.

The CFE has continues to weave the College’s DEI objectives into each one of its programs and has placed significant effort into enhancing diversity, equity, and inclusion in entrepreneurship and innovation, particularly in STEM fields of study.

Talent is equally distributed among all demographics, but often access to world-leading startups is not. At the CFE, our strategy is to provide equal access to students of all backgrounds to these world-changing startups.

The CFE has concentrated its efforts to increase the number of female and URMs who are part of its instructional faculty team – growing the number from zero in Fall 2014 to seven (28%) in Fall 2018.

"This course has been more than what I was looking for. The resources provided, the lessons, and way it’s taught are going to stick with me forever." - ENTR 500 Level Student

% 10 20 30 40 50

Female

UG

Master’s

Ph.D.

%URM*

UG

Master’s

Ph.D.

% 2017

2018

*URM = Underrepresented Minorities, which includes Black, Hispanic and Native American. Percent based on ethnicity of domestic students only.

The CFE has concentrated its efforts to increase the number of female and URMs who are part of its instructional faculty team – growing the number from zero in Fall 2014 to seven (28%) in Fall 2018.
The Entrepreneurs Leadership Program uses a combination of mentorship, project-based learning, relationship-building opportunities, interactions with entrepreneurial leaders, specialized coursework, and summer internships at innovative companies to provide high-potential students with skills and experiences that will differentiate them as entrepreneurial leaders.

2019 ELP Cohort: 23 SELECTED

"ELP gave me the confidence, network, and knowledge I needed to thrive as an entrepreneur.”
- Michael Kovalcik, ELP Fellow

In support of CFE’s goal of creating a robust entrepreneurial ecosystem in Southeast Michigan, two-thirds of these students interned for local startups this summer.

cfe.umich.edu/elp

TechLab at Mcity, our Company-in-Residence program for early-stage advanced mobility companies in the connected and autonomous vehicle industry, continues to be an innovative model for immersive entrepreneurial education. The program combines top-tier student talent with technological pioneers in the advanced mobility space to develop, demonstrate, and deploy critical technological products, and leverages U-M’s regional access to the automotive and transportation industries as well as the unique Mcity test facility.

ACADEMIC YEAR 2018-19

6 COMPANIES
27 STUDENTS

“Our partnership with TechLab at Mcity has been one of the most enduring and productive research collaborations we’ve ever participated in.”
- Ro Gupta, Co-founder & CEO, CARMERA

During AY 2018-19, Toyota, a founding member of Mcity, partnered with Carmera to utilize 3D mapping tech that was developed by a talented group of students at TechLab. This technology is now used in Carmera’s production software, and is currently utilized in Toyota vehicles. During the collaboration at TechLab at Mcity, Carmera raised an additional $20M in funding.

This is a prime example of U-M acting as a convener and facilitator for the global startup community while delivering a valuable educational experience for students.

cfe.umich.edu/techlab-mcity
TechArb, the U-M Student Innovation Hub, is a joint initiative of the Center for Entrepreneurship and Zell Lurie Institute, with support from the Office of the Provost and the U-M Office of Research. The program serves as a training ground for U-M students to become tomorrow’s leading entrepreneurial thinkers and doers as they position themselves for real world impact.

**ACADEMIC YEAR 2018-19**

TechArb provides out-of-the-classroom programming that empowers students to bring their ideas to life through intensive and structured entrepreneurial experiences.

Students engage in a rigorous 16-week program comprised of seminars, mentoring, and coaching sessions, and develop proficiency in core concepts of entrepreneurship.

The program continues to be a significant connector to the local ecosystem and U-M alumni. In the last year, more than 100 mentors engaged with the TechArb Student Venture Accelerator.

“**A lot of doors are opening to us because of TechArb. The support of the University of Michigan, TechArb, the CFE and ZLI gives us a lot of validation.**”

- Caio Brandao, TechArb Summer ’19 Cohort, BackPac Co-Founder

**MTRAC TRANSPORTATION INNOVATION HUB**

The Michigan Translational Research and Commercialization (MTRAC) Innovation Hub for Advanced Transportation program funds projects that commercialize university research into products or services that shape the future of transportation technology or address poorly met transportation market needs. It provides critical gap funding to faculty and graduate student innovators seeking to commercialize technology from the lab. The program has awarded $3.29M to 36 teams across the State of Michigan since its inception.

In June 2018, the MTRAC Transportation Oversight Committee voted to provide full ($100k per team, for one year) awards to six teams from 19 applicants among six different institutions across the State of Michigan.

The MTRAC program is supported by funds from the Michigan Strategic Fund and administered by the Michigan Economic Development Corporation, with additional funding coming from partner institutions.

MEDC’s Entrepreneurship & Innovation initiative establishes Michigan as the place to create and grow a business by providing high-tech startup companies with access to a variety of critical resources, such as funding and expert counsel, from ideation to maturation.

**CURRENT AWARDEES**

MTRAC has also launched a Kickstart program (~$50k per team, six months) to fund early-stage ideas. The primary purpose of the Kickstart program is to support early stage ideas to perform a go/no-go assessment and determine their commercial viability.

- **All-Weather LIDAR System for Autonomous Vehicles**
- **Antimicrobial Coatings with Instant & Persistent Efficacy**
- **Coaxial Thermophone for Active Noise Control in Vehicles**
- **Advanced 5G Wireless Technology for Mesh Networking**
- **Self-Powered IoT for Smart Manufacturing / Transportation**
The National Science Foundation Innovation-Corps prepares engineers and scientists to extend their focus beyond the laboratory and to accelerate the transfer of cutting-edge, NSF-funded research into commercial success.

A major goal of the program is to re-imagine the university process from research ideation to invention to spinout, in order to enhance regional and national competitiveness by better leveraging leadership in science.

In AY 2018-19 the CFE successfully started the third year of the NSF Midwest I-Corps program in partnership with Purdue University, the University of Illinois at Urbana Champaign, and the University of Toledo. The CFE also continued to routinely work with entrepreneurial counterparts at 30+ institutions throughout the Midwest.

“Innovation is inherent to an academic environment. I-Corps helped me in taking my research in the right direction to convert it into a product that addresses a societal need and has an impact.”

- Professor Shorya Awtar, Mechanical Engineering

“After participating in I-Corps, I realized that what we do as academic research is such a small part of the big picture. It takes a lot more than lab work to bring it to the end users.”

- Dr. Nina Lin, Associate Professor of Chemical Engineering

**AY2018-19 PROGRAM HIGHLIGHTS**

**Industry Connect:** These programs bring together entrepreneurial teams from across the U.S. to participate in industry conferences focused on Big Data, AgTech, Autonomous/Connected Vehicles, and Medical Devices & Manufacturing.

**Mentorship Pilot:** MWIN explored new mentorship models that embody the public-private partnership at the heart of the NSF Innovation Corps. Combining expertise and networks has provided an opportunity to find the best applications in emerging research.

**SBIR Phase 0 Pilot:** The Federal Government is the largest seed investor in technology in the United States. The I-Corps program is exploring ways to enhance the impact of the seed investments to increase the significance within the U.S. economy.

**Michigan Insights Innovation Summit:** In partnership with eLab Ventures, the CFE brought together scientists and engineers, industry leaders and venture capitalists for a two-day boot camp to frame tough problems, collaborate, identify disruptive innovation and develop a plan for a solution. The event showed great promise in facilitating the networks needed for new and impactful startups to form.

**COMMERCIALIZING RESEARCH**

- **$1.8 Million**
  Invested by the fund

- **$20.3 Million**
  Total equity raised by portfolio companies

- **$15.5 Million**
  Total non-dilutive grant funding raised

- **84 Jobs**
  Created by portfolio companies

**SEED FUND PORTFOLIO COMPANIES**

**$300,000**
Federal EDA RIS Grant

“The fund is an important investment and mentoring resource for biomedical startups. For Arborsense, the fund was instrumental to the development of our Minimum Viable Product which helped us engage with potential customers and future investors.”

- Girish Kulkarni, Co-Founder & President of Arborsense

The fund is an effective catalyst for U-M startups that serves to drive the university’s leadership position in biomedical technology that attracts world-class research and entrepreneurial talent to U-M and the broader Ann Arbor ecosystem.

By combining the best ideas with the right talent and enabling effective execution, the fund seeks to maximize its portfolio companies’ impact on healthcare and financial success.
The University of Michigan's Entrepreneurial Ecosystem Consists of Many Collaborators

LEADERSHIP
Jonathan Fay, Dixon and Carol Doll Executive Director
David Wentzloff, Faculty Director

EDUCATION
Christine Gordon, Assistant Director of Curriculum and Experiential Learning
Charles Keenan, Educational Programs Specialist
Chiara Lazzereschi, Educational Programs Coordinator

FELLOWSHIPS
Nick Moroz, Assistant Director of Entrepreneurial Practice
Emilee Studley, Fellowship Programs Specialist

TECH ACCELERATION
Eric Petersen, MTRAC Transportation Innovation Hub Program Director
Hirak Parikh, Michigan Biomedical Venture Fund Manager
Divya Patil Hangargekar, Engineering Technology Development Specialist
Lora Stevens, Technology Acceleration Programs Manager
Matthew Okoneski, Michigan Biomedical Venture Fund Analyst

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