

UTSA Knowledge Enterprise

2019

ANNUAL REPORT

1969

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2019

UTSA[®]

Office of the Vice President for
Research, Economic Development,
and Knowledge Enterprise



It is my pleasure to present our annual report for fiscal year ending August 31st, 2019, focused on the research and economic activities of the faculty, students, staff, and associated partners at The University of Texas at San Antonio (UTSA).

Under the leadership, Dr. Taylor Eighmy, our team serves the needs of our various stakeholders to realize their goals. With the combined strength of the Research Office with the Institute of Economic Development (Institute/IED), we are focused on the institution's mission to drive San Antonio's knowledge economy,

Research on campus had its best year ever. In fiscal year 2018-2019, total research expenditures increased to US \$80.6 million, with the university's restricted research expenditures growing to US \$50.7 million. In total, 385 new awards were received in FY2019, worth \$82.9 million. Research expenditures are on target to meet National Research University Fund (NRUF) eligibility and Carnegie Research 1 status [see pages 4-5].

In 2019, the Institute served 43,320 existing and aspiring entrepreneurs, generating a total of \$2.9 billion in direct economic impact. Of those who received advising, training and business research assistance, over 1,000 businesses were started or experienced significant growth, resulting in the creation or retention of close to 20,000 jobs. Additionally, these businesses generated \$291 million in new financing and \$35 million in new tax revenue, with new sales, contracts and exports valued at \$2.9 billion dollars.

Committed to the pursuit of knowledge, the research activities of faculty, students, and collaborators have contributed to achieving our highest research results to date, a trend for the last few years.

Our office is here to support you and offer guidance as needed. Your input is important to us so please reach out to us at any time.

Regards,

Bernard Arulanandam, Ph.D., MBA

Vice President for Research, Economic Development,
and Knowledge Enterprise

Annual Report of Sponsored Program Activities for
the fiscal year ending August 31, 2019.

Report Data Finalized December 31, 2019.

The University of Texas at San Antonio
The Office of the Vice President for Research,
Economic Development, and Knowledge
Enterprise

Bernard Arulanandam, Ph.D., M.B.A.
Vice President for Research, Economic Development,
and Knowledge Enterprise

Michelle (Mickey) Stevenson, Ph.D., CCEP
Associate Vice President for Research Integrity

Rodrick McSherry
Associate Vice President for Innovation
and Economic Development

Howard Grimes
Associate Vice President and Associate
Vice Provost for Institutional Initiatives

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Assistant Vice President,
Research Finance and Operations

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Assistant Vice President, Strategic
Initiatives & Research Partnerships

Guy Walsh
Executive Director, National Security
Collaboration Center

Christine Burke, Ph.D., MBA
Director, Office of Commercialization
and Technology Transfer

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Prepared by the Office of the Vice President for
Research, Economic Development,
and Knowledge Enterprise
Design and Production:

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Director of Communications

Adrianna San Roman
Graphic Designer

Revised 2020. Data sources include: Sponsored
Projects Administration, Research Support,
Commercialization and Innovation, Research Integrity,
and Research Finance and Operations. All financial
data has been rounded to the nearest dollar.

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research@utsa.edu

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Associate Deans for Research

Suat Gunhan, Ph.D.
College of Architecture, Construction & Planning

Hamid Beladi, Ph.D.
College of Business

Michael Karcher, Ph.D.
College of Education and Human Development

David Akopian, Ph.D.
College of Engineering

Sandra Morissette, Ph.D.
College of Liberal and Fine Arts

Robert Tillyer, Ph.D.
College of Public Policy

Jose Lopez-Ribot, Pharm.D./Ph.D.
College of Sciences

RESEARCH PILLARS

As education evolves in the 21st century, innovative research occurs when scholars break through their academic silos and apply their expertise to other disciplines to truly create collaborative transdisciplinary research. This is when research breakthroughs occur.

This past year, UTSA reconfigured and broaden the existing areas of research expertise to allow for more faculty to participate in broad research areas to address societal challenges and create meaningful impact for larger segments of our communities.

Cyber



- CLOUD
- CYBERSECURITY
- DATA ANALYTICS
- COMPUTATIONAL/INFORMATICS

As the institution is intrinsically linked with cybersecurity given the city's military history, the relationships we have created have added to our depth of offerings, and poised our region as a key research hub for all things cyber.

Health



- BRAIN HEALTH
- BIOREGENERATION
- INFECTIOUS DISEASE
- POPULATION STUDIES

Dedicated to advancing human health, we examine and deliver comprehensive solutions that not only advance the health and wellness of local communities but have applications for communities around the world.

Social-Economic Transformation



- DISPARITIES
- CAREER-ENGAGED EDUCATION
- ENTREPRENEURSHIP
- HUMAN DEVELOPMENT

Access to education and research are key factors in addressing societal disparities to transform lives by bettering economic prospects for all, whether it's an individual, a family or a community.

Fundamental Futures



- MATERIALS
- SPACE SYSTEMS
- SMART INFRASTRUCTURE
- NATIONAL SECURITY

As we seek to better our physical world through research, new worlds are being examined and analyzed. Whether it's space exploration or nano scale investigation, we are learning how to adapt and find ways to flourish in this new reality.

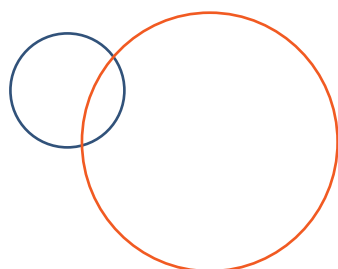
RESEARCH EXCELLENCE

Committed to the guiding principal that great universities need great cities and great cities need great universities, UTSA is on the fast track to becoming a nationally-recognized multicultural discovery enterprise.

With a bold mandate from our president, our goal has been to aggregate the various initiatives and launch new activities to increase national and international recognition of UTSA as an institution of research excellence and to reach status as a research-intensive University.

Carnegie

UTSA is currently classified as an R2 “High research activity” institution by the Carnegie Classification of Institutions of Higher Education. Our goal is to be classified as an R1 Research Intensive University. This particular classification is focused primarily on:



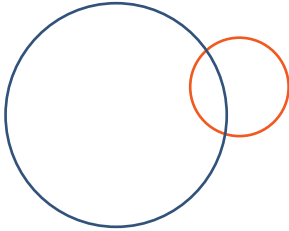
1. Research expenditures generated by STEM research activity
2. Research expenditures generated by Non-STEM research activity
3. Number of doctoral degrees produced yearly in the fields of STEM, humanities, social sciences and other professional fields.
4. Number of postdoctorates and non-faculty research staff with doctorates.

CRITERIA	Reporting Year 2015	Reporting Year 2018
STEM R&D Expenditures	\$42.3M	\$64.1M
Non-STEM R&D Expenditures	\$4.7M	\$6M
Ph.D.s Awarded Annually	106	126
Postdocs/Research Staff	57	85

NRUF

The National Research University Fund (NRUF) was established by the Texas Legislature in 2009 “to provide a dedicated, independent, and equitable source of funding to enable emerging research universities in this state to achieve national prominence as major research universities.”

An institution is eligible for the fund once they meet the benchmarks in the following categories.



1. Designated as an emerging research university in the Texas Higher Education Coordinating Board's (THECB) accountability system
2. Have expenditures of at least \$45 million in restricted research minus the institution's F&A (Facilities and Administrative) costs
3. Comply with five of the following:

CRITERIA	As of 8/31/2019	Target
Restricted Research Expenditures	\$44.1M	\$45M
Endowments	\$172M	\$400M
Faculty in National Academics	2	5
Faculty Prestigious Awards	4	7
Ph.D.s Awarded Annually	130+	200
Freshman Class of High Academic Achievement	✓	✓
Institutional Recognition of Research Capabilities and Scholarly Attainment	✓	✓

EXPENDITURES

TOTAL RESEARCH EXPENDITURES

\$80,630,940

RESTRICTED

\$50,789,078

FEDERAL

\$34,588,197

UNRESTRICTED

\$29,841,862

GENERAL

\$17,048,627

NON-FEDERAL

\$16,200,880

DESIGNATED

\$12,793,235



TOP 10 LARGEST AWARDS

Latino Teacher Academy Learning Community
Lorena Claeys, Margarita Machado-Casas, Belinda Flores, Norma Guerra
College of Education and Human Development
US Department of Education | \$3,748,848

Proteoglycans and Age-related Deterioration of Bone Toughness
Xiaodu Wang, Wei Gao, Anuradha Roy
College of Engineering, College of Business
National Institute of Health | \$2,334,480

NASA Center for Advanced Measurements in Extreme Environments (CAMEE)
Hongjie Xie, Kiran Bhaganagar, Alberto Mestas-Nunez, Stephen Ackley, Christopher Combs
College of Sciences, College of Engineering
Natl Aeronautics & Space Administration | \$2,999,998

Center for Male Reproductive Epigenomics; Germline-mediated intergenerational epigenetic inheritance of paternal
John McCarrey
College of Sciences
University of Nevada Reno | \$2,095,800

Spatial Patterning of Water Quality in the Leon Creek Watershed Recharge Zone as a Function of Urban Development, and Community Education of the Threats and Conservation of the Edward's Aquifer
Janis Bush, Brian Laub
College of Sciences
City of San Antonio | \$2,671,236

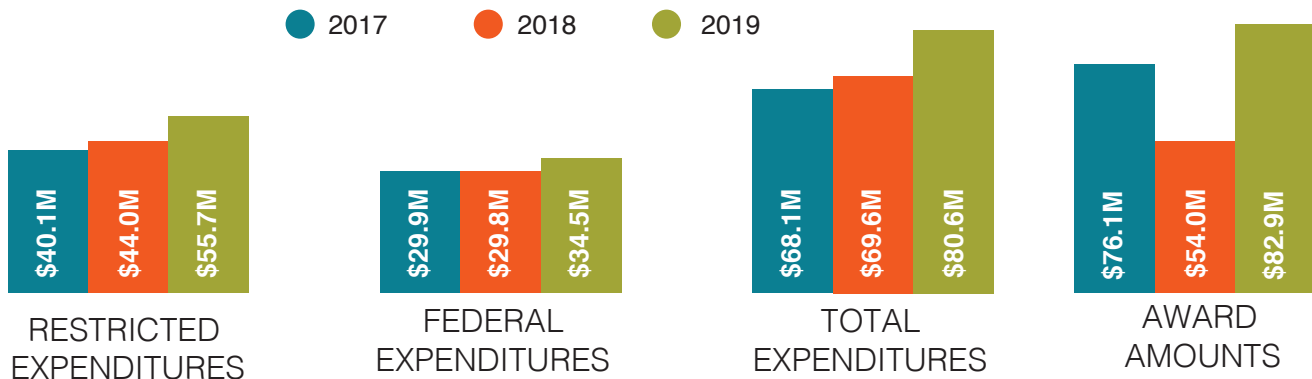
The UTSA IC CAE Critical Technology Studies Program
Max Kilger, Peyman Najafirad
College of Business
US DOD Defense Intelligence Agency | \$2,000,000

Precision Models of ARX-Associated Neurodevelopmental Disorders
Jenny Hsieh
College of Sciences
National Institute of Health | \$2,635,968

Expansion of the Building A Healthy Temple Cancer Prevention Program in Bexar County and Rio Grande Valley
Meizi He, Summer Wilmoth
College of Education and Human Development
Cancer Prevention and Res Institute of Texas | \$1,999,503

South West TX SBDC Program Renewal FY18-19
Albert Salgado
Office of the Vice President of Research, Economic Development, and Knowledge Enterprise
US Small Business Administration | \$2,489,336

Hydrology Infrastructure Data Collection and Analysis Services
Hatim Sharif, Samer Desouky, Angela Weissmann, Marcio Giacomoni, Hazem Rashed-Ali, Vikram Kapoor
College of Engineering, College of Architecture
Texas General Land Office and Vet Land Board 305 | \$1,536,419



EXPENDITURES

RESEARCH EXPENDITURE BREAKDOWN BY COLLEGE/UNIT

COLLEGE	AMOUNT
Architecture, Construction, and Planning (CACP)	\$411,830
Business (COB)	\$5,814,384
Education & Human Development (COEHD)	\$6,834,993
Engineering (COE)	\$16,878,083
Liberal & Fine Arts (COLFA)	\$5,213,202
Public Policy (COPP)	\$2,212,997
Sciences (COS)	\$36,684,544
Honors College	\$15,023
University (UNIV)	\$2,304,527
VP Academic Affairs (VPAA)	\$685,594
VP Research, Economic Development, and Knowledge Enterprise (VPREDKE)	\$2,635,307
Other (VPAA, VPBA, VPDAR, VPEA, VPIE, VPIMT, VPSA, VPSE, VPSS, VPUR)	\$940,451

TOTAL

\$80,630,940

EXPENDITURES

RESEARCH EXPENDITURES BREAKDOWN

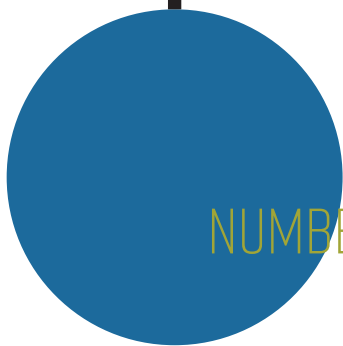
BY RESEARCH CENTERS & INSTITUTES

RESEARCH CENTERS/INSTITUTES	AMOUNT
Center for Infrastructure Assurance and Security (CIAS)	\$2,506,621
South Texas Center for Emerging Infectious Diseases (STCEID)	\$4,634,023
Center for Research and Training in the Sciences (CRTS)	\$4,577,246
Neurosciences Institute (NI)	\$2,383,784
Center for Innovation and Drug Discovery (CIDD)	\$1,611,055
Institute for Demographic and Socioeconomic Research (IDSR)	\$1,019,039
Texas Sustainable Energy Research Institute (TSERI)	\$1,226,198
Institute for Cyber Security (ICS)	\$1,234,937
Center for Simulation Visualization and Real Time Prediction (SiViRT)	\$654,981
Institute for Health Disparities Research (IHDR)	\$597,746
Center for Archeological Research (CAR)	\$896,818
Open Cloud Institute (OCI)	\$719,701
Center for Research and Policy in Education (CRPE)	\$139,994
San Antonio Cellular Therapeutics Institute (SACTI)	\$515,830
Center for Cultural Sustainability (CCS)	\$161,462
Center for Advanced Manufacturing & Lean Systems (CAMLS)	\$321,030
Center for Water Research (CWR)	\$263,508
Center for the Inquiry of Transformative Literacies (CITL)	\$264,686
Bank of America Child and Adolescent Policy Research Institute (BACAPRI)	\$1,691
Center for Urban and Regional Planning Research (CURPR)	(\$38,091)*
Team Autism Research Center (ARC)	\$186,052
Cyber Center for Security and Analytics <i>*formerly CER/2S</i>	\$1,310,568
Center for Community Based and Applied Health Research (CCBAHR)	\$78,084

TOTAL

\$25,260,975

*CURPR had research expenditures of \$17,714 in FY2019. The figure above reflects adjustments of - \$55,805 for legacy projects.



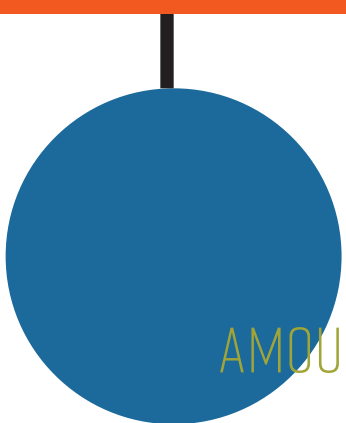
AWARDS

NUMBER OF AWARDS BY COLLEGE

COLLEGE	FY2019
Architecture, Construction, and Planning (CACP)	20
Business (COB)	17
Education & Human Development (COEHD)	28
Engineering (COE)	78
Liberal & Fine Arts (COLFA)	83
Public Policy (COPP)	24
Sciences (COS)	98
University (UNIV)	3
VP Research, Economic Development, and Knowledge Enterprise (VPREDKE)	22
VPSE	7
Other (VPAA, VPBA, Library, VPIMT)	5

TOTAL

385



AWARDS

AMOUNT AWARDED BY COLLEGE

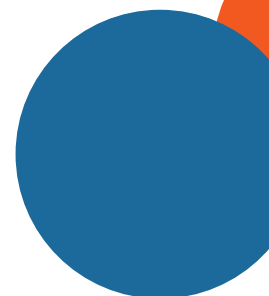
COLLEGE	AMOUNT
Architecture, Construction, and Planning (CACP)	\$470,265
Business (COB)	\$3,850,709
Education & Human Development (COEHD)	\$10,187,585
Engineering (COE)	\$21,029,974
Liberal & Fine Arts (COLFA)	\$4,157,334
Public Policy (COPP)	\$1,392,430
Sciences (COS)	\$31,542,983
University (UNIV)	\$533,530
VP Research, Economic Development, and Knowledge Enterprise (VPREDKE)	\$9,356,657
VP Strategic Enrollment (VPSE)	\$358,039
Other (VPAA, & VPBA, Library, VPIMT)	\$110,336

TOTAL

\$82,989,845

PROPOSALS

SUBMISSIONS BY SPONSOR TYPE



SPONSOR TYPE	SUBMITTED REQUESTS
Federal Government	356
State Government	193
Private	259
Federal Pass Through	176
Foundation	0
Local Government	40
Other Government	3
Buisness	0
Development & Gifts	13
Development & Gifts for Endowments	0

TOTAL

1040



PROPOSALS

SUBMISSIONS BY COLLEGE

COLLEGE	SUBMITTED	AMOUNT REQUESTED
Architecture, Construction, and Planning (CACP)	47	\$4,728,709
Business (COB)	46	\$17,673,568
Education & Human Development (COEHD)	92	\$23,021,115
Engineering (COE)	288	\$119,769,058
Liberal & Fine Arts (COLFA)	169	\$32,779,601
Public Policy (COPP)	37	\$4,223,759
Sciences (COS)	315	\$200,577,949
Other (VPAA, VPBA, VPSE, VPIMT)	13	\$776,779
Graduate School	0	0
Library	22	\$79,691,147
VPREDKE	1	\$1,405
University College (UNIV)	10	0
TOTAL	1040	\$483,243,092

OFFICE OF RESEARCH SUPPORT

The Office of the Research Support offers a variety of internal awards to encourage faculty to seek out new research ideas and expand scholarly works. The seed grant programs support the knowledge enterprise by awarding faculty members funding to explore new areas of research. Faculty can work out new ideas, create new collaborations, either in a different or complementary fields or obtain preliminary data that can be cited in applications for extramural funding, all to enhance the breadth of scholarly and creative activity on campus.

FY2019 AWARD TOTALS

CACP . . . 3 awards . . . \$15,000

COB . . . 7 awards . . . \$35,000

COE . . . 5 awards . . . \$190,000

COEHD . . . 5 awards . . . \$55,000

COLFA . . . 8 awards . . . \$60,000

COPP . . . 1 awards . . . \$20,000

COS . . . 3 awards . . . \$120,000

TOTAL \$495,000

Return on Investment

In fiscal year 2018, the VPR awarded:

29 Seed Grant Awards
Totaling **\$340,000**

AS OF SPRING 2020

VPREDKE tracks two years of research output.
Return on seeding research for FY 2018 Awardees

54 Grant Submissions
17 Awards
61 Submitted Publications
49 Undergraduate Students
39 Graduate Students
1 Postdoctoral Scholars
3 Visiting Scientists Engaged
41 Other Scholarly Works

RESULTED IN A RETURN ON
INVESTMENT TOTALING:

\$1,886,684

GRANTS FOR RESEARCH ADVANCEMENT AND TRANSFORMATION (GREAT)

09.01.2018 - 08.31.2019

\$120,000 awarded: \$20,000 per researcher x 6 new projects

The GREAT program provides seed grants to support new areas of research for faculty at UTSA, to assemble preliminary data that can be used to seek extramural funding and advance UTSA's goal of reaching Tier One status.

College of Engineering

Electrical & Computer Engineering

Lide Duan

A Full Stack Solution for NVM-Based Deep Learning Acceleration

Electrical & Computer Engineering

Sara Ahmed

Enhanced Stability, Protection, and Control for Low-Inertia Power Grids

College of Education and Human Development

Educational Psychology

Guan Shaw

PreFreshman Engineering Program (PREP) and Students STEM Academic and Motivational Factors

Kinesiology, Health and Nutrition

Eunhee Chung

The Role of Maternal Exercise on Microbiota and Inflammation in Pregnant Dams and Their Offspring

College of Public Policy

Criminal Justice

Megan Augustyn

College Crime Victimization Survey: Examining Traditional and Cybervictimization among College Students at a Hispanic Serving Institution

College of Sciences

Biology

Nicole Wicha

Localizing Arithmetic in the Developing Brain

GREAT

INTERNAL RESEARCH AWARDS (INTRA)

09.01.2018 - 08.31.2019

\$100,000 awarded: \$5,000 per researcher x 20 new projects

The Internal Research Awards (INTRA) program is part of the UTSA Vice President for Research's coordinated efforts to promote research and scholarship of the highest quality. This program offers experience in identifying and submitting applications to potential funding sources, provides preliminary data to support applications for extramural funding, and enhances scholarly and creative activities.

College of Architecture, Planning and Construction

Architecture

Jae Yong Suk

Investigation of Electric Lightning Energy Savings by Daylight Haversting in Dynamic Sky Condition

Architecture

John Alexander

History of Totona's Piazza del Duomo with Information from Ground-Penetrating Radar

Construction Science

Sandeep Langar

Knowledge, Perceptions, and Decisions for Resilient Facilities

College of Business

Accounting

Jennifer Yin

The Alignment between Stewardship and Valuation Roles of Revenues

Accounting

Juan Mao

Roles of Audit Firm Networks and Their Consequences in Audit Services: Evidence from US Small Audit Firms

Accounting

Zhongxia (Shelly) Ye

The Risk Committee Process for US Publicly Traded Firms

Management

Matthew McCarter

Constellation Interdependence, Trust, and Cooperation in Alliance Partnerships: An Experimental Approach

Management Science & Statistics

David Han

Bayesian Design Optimization of a Non-specific Sensor System for Calibration of Analyte Responses, and a New Measure of Analytical Selectivity

Management Science & Statistics

Kefeng Xu

Consumer Reference Dependency, Loss Aversion and Sources of Blame in Service Competition

INTRA

Management Science & Statistics

Victor De Oliveria

Bayesian Analysis of a Multivariate Density Ratio Model

College of Education and Human Development

Education Leadership & Policy Studies

Vanessa Sansone

College Access and Geography: The Experience of Rural Youth in Texas

Kinesiology, Health, and Nutrition

Langston Clark

Black Student Athletes and Social Movements: A Pilot Study

Accounting

Zhongxia (Shelly) Ye

The Risk Committee Process for US Publicly Traded Firms

Kinesiology, Health, and Nutrition

William Land

Optimal Psychophysiological States during Police Officer Use-of-Force Scenarios: A Multiple Case Study Analysis

College of Liberal and Fine Arts

Anthropology

Patrick Gallagher

Social Narratives of Climate Change in the Greater Caribbean: New Ecologies of Arrival and Incorporation

Anthropology

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Communication

Sara DeTurk

Refugee Advocacy and Coalition Building in the U.S. Southwest

Communication

Seok Kang

Going Beyond Just Watching: The Fan Adoption Process of Virtual Reality Sports

English

Kenneth Walker

Climate Politics on the Border

Political Science & Geography

Boyka Stefanova

A Blessing in Disguise? The Dual Failure of Gorbachev's Template for Economic Reform and China's Model of State Capitalism in Eastern Europe (1985-1989)

Psychology

David Pillow

Predictors of Bariatric Surgical Outcomes and the Process of Negotiating a New Self

Psychology

Paul Romanowich

Quantifying the association between risky smartphone use and impulsivity

CONNECTING THROUGH RESEARCH PARTNERSHIPS (CONNECT)

09.01.2018 - 08.31.2019

\$250,000 awarded: \$125,000 per team (\$50,000 UTSA; \$75,000 SwRI)

The CONNECT Program is a joint effort between The UTSA and the Southwest Research Institute (SwRI). The program encourages interaction between investigators in support of the acquisitions of established extramural, peer-reviewed research funding. This agreement provides unprecedented opportunities for researchers to work together in addressing issues of mutual interest and need.

The Connect program was founded to enhance scientific collaboration between SwRI and UTSA and increase their research funding base. The two selected projects will investigate biofilm corrosion in pipelines and an ultrasound drug delivery methodology.

Mechanical Engineering

Lyle Hood, UTSA

Albert Zwiener, SwRI

A Biodegradable, 3D-Printed Implantable for Minimally-Invasive Controlled Delivery

Civil & Environmental Engineering

Vikram Kapoor, UTSA

Ronald Green, SwRI

Development and Deployment of a New Class of Environmental Tracers

CONNECT

SAN ANTONIO LIFE SCIENCES INSTITUTE

The San Antonio Life Sciences Institute (SALSI) leverages the collective power of UTSA and UT Health SA through formalized collaborations and curriculum alignments. Not only does SALSI provide joint research opportunities but also funds basic and translational research through an established grant awards program.

This funding advances innovation in patient care and health promotion in the life sciences, increases our competitiveness in pursuit of federal funding programs, and leads to increased joint publications, patents and copyright filings.

SALSI FY2019 INNOVATION CHALLENGE AWARDEES

06.01.2018 - 05.31.2019

\$200,000 awarded: \$100,000 per team (\$50,000 per Institution)

Jenny Hsieh, UTSA COS Biology
Daniel Lodge, UT Health SA

Modeling addiction-related interneuron dysfunction in human cerebral organoids

Matthew Wanat, UTSA COS
James Lechleiter, UT Health SA Long School of Medicine
Targeting astrocytes as a novel strategy to reduce cocaine self-administration

SALSI FY2019 CLUSTERS IN RESEARCH EXCELLENCE AWARDEES

06.01.2018 - 05.31.2019

\$100,000 awarded: \$50,000 per Institution

Qian "Guenevere" Chen, UTSA COE
Shouhuai Xu, UTSA COS Computer Science
Kathleen Stevens, UT Health SA School of Nursing
Azizeh Sowan, UT Health SA
Enhancing Safety and Security of Clinical Alarm Systems: An interdisciplinary Cyber-Physical-Human Analysis



SALSI FY2019 PILOT AWARDS FOR OPIOID EPIDEMIC RESEARCH AWARDEES

08.01.2018 - 07.31.2019

\$50,000 awarded; \$25,000 per Institution

Sandra Morissette, UTSA COS
Jennifer Sharpe Potter, UT Health SA, School of Medicine
Mindfully Adherent: A Tailored mHealth Intervention to Optimize Medication Adherence for Opioid Use Disorder

OFFICE OF COMMERCIALIZATION & INNOVATION

[2018 Innovator of the Year]

John Quarles (Computer Science) was named the 2018 UTSA Innovator of the Year, based on a number of factors including technology disclosures, patent filings, issued patents, licenses, and overall innovation and ideation.

An associate professor of computer science, Quarles uses cutting edge technology to create video games and other devices to help people in need. His interests include virtual reality, mixed reality, augmented reality, serious games, 3D user interfaces, interactive computer graphics, human-computer interaction, and modeling and simulation.

Over his career, he has developed a world-wide reputation as a leader in the use of augmented and virtual reality for medical training, stem education, exercise, and physical and cognitive therapies. He has widely published in the fields of augmented and virtual reality and is recognized as one of the world's leading experts in the use of this technology. He has also received nearly a million dollars of research funding, most coming from the National Science Foundation.

As a co-founder of MedCognition, Quarles integrated the latest augmented reality and computing technology into a patient simulator called PerSim™. Portable and affordable, PerSim™ is a combination of proprietary software and off-the-shelf hardware that allows first responders to be trained in a number of medical emergency scenarios.

The Office of Commercialization and Innovation continued its growth within its innovation ecosystem. FY19 was a record year for startups with six signing their first UTSA license or option agreement into place, and at nine total agreements, it was UTSA's second best year overall.

In FY19, OCI managed 53 new technology disclosures, with 69 patents filed, and incubated eight companies. With 25 patents issued, FY19 hit a new high water mark for UTSA. Three more UTSA teams were selected to participate in the NSF's National I-Corps Program national cohort, bringing the total to 15 since 2015.



Leaptran receives global honor for innovation

Leaptran, a UTSA spinout, was designated a Smart 50 awardee. Organized in partnership with Smart Cities Connect, SCC Foundation and US Ignite, the annual Smart 50 Awards honor the world's most innovative and influential smart cities projects. Leaptran CEO and energy storage expert Jeff Xu accepted the award at the annual SCC Spring Conference & Expo.

Winning in the Urban Operations category, Leaptran has built a cost-effective HVAC monitoring and control system for underserved medium-size commercial buildings. Based on an internet-of-things (IoT) platform, it consists of a hardware and software solution. The hardware assembly includes Wi-Fi enabled thermostats, remote accessible electricity sub-meters and cloud connected and/or local computation devices. A software solution, Leapsmart™, has been created to produce optimized online control.

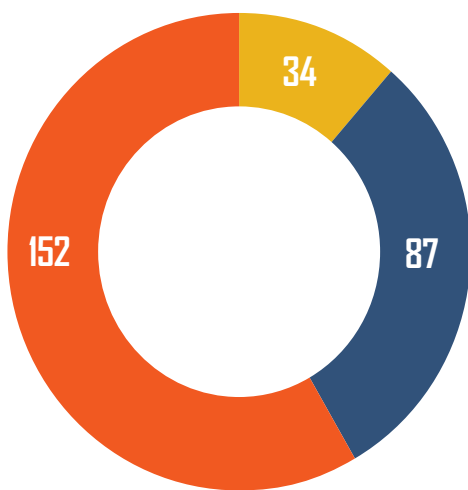
COMMERCIALIZATION ACTIVITY SUMMARY

Technology innovation and commercialization are major focuses of the UT System and other Tier One universities throughout the state and nation. The office establishes UTSA procedures and policies for technology transfer and commercialization, and provides training to faculty, staff, and students. It also spearheads a commercialization council that connects UTSA with regional technology commercialization partners.

Activity	FY 15	FY 16	FY 17	FY 18	FY 19
Commercial Agreements (Contract, SRA, MOU, NDA, & MTA)	105	143	109	102	92
New Invention Disclosures	41	53	62	51	53
Patents Filed	69	71	53	67	69
Copyrights & Trademarks	3	4	1	3	0
New License/Options Signed	7	3	8	6	9
Technologies Licensed/Optioned	7	3	10	7	8
Companies Incubated (New Venture Incubator)	15	15	7	7	8

5 YEAR TECHNOLOGY DISCLOSURES

BY COLLEGE



College of Engineering



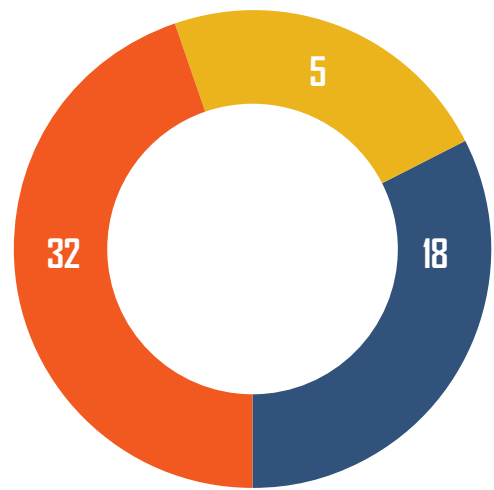
College of Sciences



Other (All other UTSA college units)

2019 TECHNOLOGY DISCLOSURES

BY COLLEGE



INNOVATION DISCLOSURES

A proposed novel way to develop a highly energy-efficient electronic device by using the nanomaterials

Ethan Chiyui Ahn

COE Mechanical Engineering

A navigation system that creates its own fingerprint database without the need for preliminary on-site surveying

David Akopian, Jafet Aaron Morales

Electrical & Computer

A groundbreaking technology in the medical utilization of Muon imaging and navigation

Miltiadis Alamaniotis

COE Electrical & Computer

Non-UTSA Inventor: **Dimitrios Miserlis**

A new biological use for quantum dots synthesized in the laboratory

Arturo A Ayon, Clarissa Denise Vazquez-Colon, Juan Adrian Zepeda-Galvez, Janeth Alexandra Garcia-Monge

Physics & Astronomy

Non-UTSA Inventors: **Humberto Herman Lara Villegas, Alvaro Flores-Pacheco**

An experimental facility developed to study the mixing and dispersion of air-borne released chemicals

Kiran Bhaganagar, Prasanna RV Kolar, Sudheer Reddy Bhimireddy, Victor Canseco

Mechanical Engineering

Electrical & Computer Engineering

A low-cost, mobile, outdoor, renewable energy-based tripod that measures wind and surface conditions and pollutant gases

Kiran Bhaganagar, Prasanna RV Kolar, Sudheer Reddy Bhimireddy, Jordan Nielson

Mechanical Engineering

Electrical and Computer

A high-performance method for ethane/ethylene separation with low energy cost at ambient conditions

Banglin Chen

Chemistry

Non UTSA Inventors: **Libo Li, Jinping Li**

A social network analytical protocol for literature and patent review and meta-analysis

Kim Kwang Raymond Choo, Zhechao (Charles) Liu

COB Information Systems & Cyber Security

A lightweight approach to designing cryptographic scheme that is secure against white-box adversaries

Kim Kwang Raymond Choo

Information Systems & Cyber Security

Non UTSA Inventor: **Debiao He**

A method to distinguish between compressed and encrypted network traffic

Kim Kwang Raymond Choo

Information Systems & Cyber Security

Non UTSA Inventors: **Fran Casino, Constantinos Patsakis**

A synthesis of azetines and their selective coupling with nitrogen and oxygen nucleophiles

Michael Patrick Doyle, Kostiantyn Oleksandrovich Marichev

COS Chemistry

A new endotracheal tube design with innovative expansion and securement mechanisms

Yusheng Feng, Robert Lyle Hood, David Berard Isaac Trevino, David Restrepo

COE Mechanical Engineering

Non-UTSA Inventor: **Robert A DeLorenzo**

Quantum circuits that exhibit entanglement of states and allow for duplicating qubits

Artyom M Grigoryan, Sos Agaian

COE Electrical and Computer

A medical device used for measuring the mechanical properties of vocal cords

Teja Guda, Vangelina Osteguín, Melanie Foster Natalia Rafiq, Divya Kamnani

COE Biomedical Engineering

Non-UTSA inventor: **Gregory Robert Dion**

Software code that imports and processes CPT data and produces graphical presentations in metric and US systems

Yilmaz Hatipkarasulu

CACP Construction Science

A software that detects anomalies in network traffic indicative of malware

Luke Holbrook

COE Electrical & Computer Engineering

A method to pull VR data into a real-world environment

Gold Hood

Mechanical Engineering

A set of products intended to help women protect themselves

Gold Hood

Mechanical Engineering

Non-UTSA Inventor: **Rachael Lynn Anderson**

A retractable pier technology to reduce infrastructure damage in coastal areas during storms and other major events

Gold Hood, Nicholas M Lopez, Brenton M Clark, Jacob P Thornbury, Francisco J Medina

Mechanical Engineering

An implantable drug reservoir for activatable controlled drug release into the human body

Robert Lyle Hood, Isidro Armando Guzman, John Effiom, Phillip Franklin, Eryk Rios

COE Mechanical Engineering

An improvement to existing flexible video cystoscope devices

Robert Lyle Hood, Soroush Ranjbar, Nestor Orlando Falcon

Mechanical Engineering

Electrical & Computer Engineering

A device combination product used to achieve various drug delivery profiles

Robert Lyle Hood, Austin Richard Schoppe, Priya Jain Gale

COE Mechanical Engineering

COE Biomedical Engineering

A design to reduce the risk of stent mechanical failure

Robert Lyle Hood, Mohammadali Sharzehee

COE Mechanical Engineering

Non-UTSA Inventor: **Keith Alan Bartels**

A new card-based strategy game that emulates a blockchain

Murtuza Jadiwala, Anindya Maiti

Computer Science/Institute for Cyber Security

A refined surgical endovascular technology based on an innovative soft robotic system

Amir Jafari, Miltiadis Alamaniotis

COE Mechanical Engineering

Electrical and Computer

Non-UTSA inventor: **Dimitrios Miserlis**

A secured and private deep learning technology model

Ram Krishnan, Mahmoud Abdelsalam, Yufei Huang

COE Electrical & Computer Engineering

COS Computer Science

A process conversion for plant oils

Oleg Larionov, Vu Tran Nguyen

COS Chemistry

An increased anti-bacterial action compound used to treat infections

Stanton McHardy, Hua-Yu Wang

Chemistry

Non UTSA Inventors: **Bryan Davies, Ashley Cunningham**

A therapeutic treatment for tumors, stroke and traumatic brain injury

Stanton McHardy, Hua-Yu Wang, Michael Tidwell, Karinel Nieves-Merced

COS Chemistry

Non-UTSA Inventors: **Eric Jacob Brenner, Ratna K Vadlamudi**

Disubstituted pyrrolidine derivatives used to treat schistosomiasis

Stanton McHardy

COS Chemistry

Non UTSA Inventors: **Philip T. LoVerde, Alexander Bryan Taylor, Reid Samuel Tarpley, Tim JC Anderson**

Methods and Compositions for the treatment of Shiga Toxicosis

Stanton McHardy

COS Chemistry

Non-UTSA Inventors: **Somshuvra Mukhopadhyay, Andrey S. Selyunin**

An automated way to wedge and slice lemons and limes to increase productivity and decreasing the chance of workplace accidents

Ty Douglas Palowski, Nicholas Ryan Haney, Ke"Yana Lynae Scott-Tyler
COE Mechanical Engineering

An automated way to wedge and slice lemons and limes to increase productivity and decreasing the chance of workplace accidents

Ty Douglas Palowski, Nicholas Ryan Haney, Ke"Yana Lynae Scott-Tyler
COE Mechanical Engineering

A deep learning techniques process to recognize video sequence performed action and its intensity

Paul Rad, Nihar Shrikant Bendre, Nima Ebadi
COE Electrical & Computer Engineering

A fast, easy protocol process for synthesizing nanoparticles with antimicrobial properties

Jose L Lopez-Ribot, Roberto Vazquez Munoz
COS Biology

A nanocluster antibiotic that can attack the microbial cell wall and cell membrane

Jose L Lopez-Ribot, Humberto Herman Lara Villegas, David M Black, Robert L Whetten, Priscilla Lopez

COS Biology, Physics & Astronomy

Non UTSA Inventor: **Marcos Alvarez**

A new process for data exchange and resource access using secure cloud based communication in smart vehicles ecosystem

Ravi Sandhu, Maanak Gupta, James Owen, Bensen Patwa

COS Computer Science

An automotive tool designed to help aid in the installation of aftermarket lift suspension systems

William Garrett Wellman, Nidia Andrea Sanchez
COE Mechanical Engineering

Non-UTSA Inventors: **Luis Ricardo Sanchez, Casey Cochran**



CORPORATE & FOUNDATION ENGAGEMENT

Working closely with UTSA's Office of Development and Alumni Relations, our office now has a dedicated resource for Corporate & Foundation Engagement (CFE). They serve as the single point of entry for companies, foundations, and industry professionals seeking access to university resources.

In collaboration with campus partners, CFE seeks to transform the partnership model at UTSA, by holistically coordinating and guiding UTSA's industry and foundation relationships from one centralized office.

MetroLab Network Membership

The City of San Antonio (COSA) and UTSA were selected as members of the MetroLab Network, a city and university collaboration for civic innovation, joining 44 cities, six countries and 60 universities across the country.

Led by COSA's Office of Innovation and UTSA, the MetroLab team members will address issues and challenges faced by residents through research and education projects. The team is also building upon the strategy of SmartSA: to leverage new and emerging technologies and data to improve the quality of life for all San Antonians. SmartSA partners include CPS Energy, the San Antonio Water System (SAWS), the San Antonio River Authority (SARA), and VIA Metropolitan Transit.

Recent projects include the delivery of the Climate Action and Adaptation Plan (CAAP) of which UTSA scholars helped co-author. This was a project undertaken by COSA, CPS Energy, UTSA and the Texas Sustainable Energy Research Institute to integrate environmental stewardship and social equity. This included establishing a baseline inventory for greenhouse gases, developing future emission scenes, identifying mitigation strategies, assessing impacts throughout the city, and creating an implementation plan. This plan is currently under review by the San Antonio City Council and is open to public comments from city residents.

OPPORTUNITY FOR IMPACT

UTSA offers diverse opportunities to engage with faculty and students that create meaningful and beneficial partnerships. THE CFE office creates:

STUDENT ENGAGEMENT

BRAND AWARENESS

RESEARCH AND INNOVATION

EXECUTIVE EDUCATION AND CONTINUING EDUCATION

STRATEGIC CORPORATE PHILANTHROPY

by utilizing the university's:

- » **28,797** students
- » **110,000** alumni
- » **10** colleges and schools
- » **30** university research centers & institutes
- » **162** degree programs
- » **400** student organizations

INSTITUTE FOR ECONOMIC DEVELOPMENT

Since 1979, UTSA's economic development programs have been building the economy, one business at a time. UTSA's Institute for Economic Development hosts a variety of centers and programs that facilitate economic, community and business development at the local, regional and national levels. Programs serve the entrepreneur who is just starting a business to the experienced business owner looking for new markets, to communities seeking to improve their economic health.

Recognizing Innovation Excellence

In 2019, the SBDC Technology Commercialization Center assisted multiple clients with identifying technical gaps, developing research solutions, and articulating their technical innovation and commercialization strategy in SBIR/STTR proposals to federal partners. During the past year, TCC clients were awarded grants totaling over \$2 million from top Federal agencies including National Science Foundation (NSF), Department of Energy (DOE), and Department of Defense (DOD).

Centers and Programs

- UTSA South-West Texas Border Small Business Development Center Network
- UTSA SBDC International Trade Center
- UTSA Small Business Development Center
- UTSA SBDC Technology Commercialization Center
- UTSA SBDC Center for Government Contracting
- SBDC National Information Clearinghouse
- UTSA Procurement Technical Assistance Center
- Center for Community and Business Research
- Southwest Trade Adjustment Assistance Center
- Minority Business Development Agency Business Center



FY 2019 \$2.9 Billion

DIRECT ECONOMIC IMPACT

SERVICE RESULTS

1,123

Training Events & Courses

30,815

Training Participants

7,694

Consulting Cases

43,320

Businesses Served

4,811

Businesses Research Tasks

ECONOMIC IMPACT

6,238

Jobs Created

13,193

Jobs Retained

565

New Business Starts

534

Business Expansions

\$34,854,959

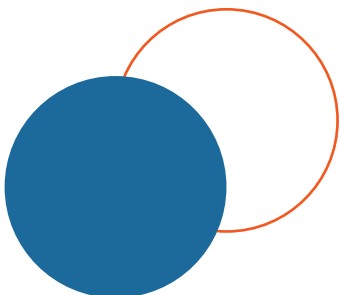
New Tax Revenue Generated

\$290,932,480

New Financing & Investments

\$2,597,538,884

New Sales, Contracts, & Exports



NATIONAL SECURITY COLLABORATION CENTER

New Collaboration Models: Research + Academic

MITRE became the National Security Collaboration Center's (NSCC) latest partner with the signing of a Memorandum of Understanding (MOU) with UTSA leadership on Friday. The formal partnership covers membership into the NSCC, a presence on campus, research collaborations, academic modules and pilot programs specializing in cyber. These endeavors target UTSA students and local San Antonio elementary school students.

MITRE is a not-for-profit company that operates seven federally funded research and development centers and works with industry and academia to solve problems that challenge the nation's safety and stability. MITRE's 8,000 employees at locations around the world deliver innovative solutions in the defense, intelligence, transportation, homeland security, healthcare, and cybersecurity fields.

MITRE is bringing its Generation AI program to campus. UTSA was selected to be an early adopter as one of five pilot schools for Generation AI. Faculty members participating in the recently-completed pilot were **Drs. Jianwei Niu** (the program lead), **Paul Rad, Ashwin Malshe**, and **Jeff Prevost**. Further training will be provided this summer to non-STEM faculty with new AI lesson modules scheduled to be launched this fall. **UTSA is considered a "Pioneer School" as the program will be rolled out to additional universities later this year.**

The NSCC, a core initiative in UTSA's Downtown Campus expansion, advances research, education and workforce development in cybersecurity, data analytics and cloud computing while anchoring the creation of an emerging high-tech corridor to support San Antonio's future.



New Leadership

The NSCC welcomed **U.S. Air Force (USAF) Brigadier General (Ret.) Guy M. Walsh** as the founding executive director.

Walsh brings a wealth of experience in building strategic alliances between federal and state government, academia and industry partners. He is among the nation's foremost leaders in national security as the strategic initiatives lead for U.S. Cyber Command, the Department of Defense's newest Combatant Command, which is co-located with the National Security Agency (NSA) at Fort George Meade, Md. **His expertise includes cybersecurity operations, international affairs and partnerships, risk mitigation and crisis response, strategic planning and execution, and local and state emergency management.**

New Accolade

In spring, the **Texas House of Representatives** introduced a resolution **recognizing UTSA for its role as one of the nation's leaders in cybersecurity education, research and training.** House Resolution 1456 also recognized UTSA's deep partnership with the Texas Department of Information Resources, the state agency responsible for ensuring the integrity, availability and confidentiality of the information assets of Texas government and public educational institutions.

UTSA is home to the No. 1 cybersecurity program in the nation, according to the Ponemon Institute, and has **three Center of Academic Excellence designations—in information assurance/cyber defense education, information assurance research and cyber operations—from the National Security Agency and the Department of Homeland Security.** San Antonio is among the nation's largest cybersecurity hubs and home to the largest concentration of cybersecurity experts and industry leaders outside Washington, D.C., uniquely positioning the city and UTSA to lead the nation in cybersecurity research and workforce development together.

As a Hispanic Serving Institution, UTSA also contributes to the diversity of NSA. The university is **one of 16 hiring and recruitment Campus Ambassador Program (CAP) schools** across the country, and UTSA alumni working at NSA have degrees in computer science, electrical engineering, mathematics, information technology and other disciplines. Over 50 UTSA graduates are currently employed at NSA, with the top graduating majors being computer science followed by electrical and computer engineering.



New Research Center

This fiscal year, UTSA's National Security Collaboration Center opened its door and welcome federal and industry partners to the campus. Inaugural members included industry partners **IPSecure, CACI International, CNF Technologies,** and federal partners **Army Research Laboratory (ARL)** and the **National Security Agency (NSA).** Housed in the North Paseo Building, this is the NSCC's first home and has expanded UTSA's ability to conduct applied research. At the close of FY19, the NSCC has 45 partners.

With the goal to advance research, education and workforce development in the areas of cybersecurity, data analytics and cloud computing, the NSCC has created a collaborative and impactful ecosystem engaging government, industry and academia to solve the nation's greatest issues surrounding cybersecurity. NSCC partners have direct access to the technical expertise of UTSA faculty and highly trained students, and specialized facilities.

New Designation

UTSA has partnered with the National Security Agency (NSA) for more than 16 years to create the talent and tools needed to address the nation's toughest cybersecurity challenges. To celebrate this partnership, the **NSA named UTSA a featured school in FY19.**

The selection is attributed to a long-standing relationship between UTSA and the NSA, dating back to the early 2000s, and in the past year, an increased research presence with the formation of the National Security Collaboration Center.

"UTSA is unique in that it is **only one of 10 colleges and universities that holds the distinction** of being designated as a Center of Academic Excellence (CAE) in all of three NSA focus areas – Cyber Operations, Cyber Defense and Research," said George C. Barnes, NSA deputy director. CAEs promote higher education and research in cybersecurity and produce professionals with the expertise to reduce vulnerabilities in our national information infrastructure.



Office of the Vice President for
Research, Economic Development,
and Knowledge Enterprise