

UNIVERSITY OF MIAMI • INSTITUTE FOR

DATA SCIENCE and COMPUTING

MAGAZINE | FALL 2020

xSAT Interactive
Covid-19 Platform

UM-CDC Panel
Data Ethics During COVID-19

MDEpiNet + IDSC
New Medical Devices

Detecting + Tracking
Fake News

Brain Investigators
International Collaboration

PCORI Awards
Evidence Map Project

Master of Science in
Data Science

IDSC Partners with
Tel Aviv University

The U Welcomes

Yelena YESHA



MIAMI



UNIVERSITY OF MIAMI
Institute for Data Science and Computing
Gables One Tower
1320 S Dixie Highway, Suite 600
Coral Gables, FL 33146-2930

305.243.4962 | idsc.miami.edu

Subscribe to IDSC magazine:
idsc.miami.edu/magazine

CONTRIBUTORS
Evelyn Cruz
Richard Westlund

GRAPHIC DESIGN
Helen Gynell

IMAGES
Jenny Abreu Images
Christopher Chung
T.J. Lievonon
Sevag Mehterian

The University of Miami is a private,
independent, international university,
and an equal opportunity/
affirmative action employer.



idsc.miami.edu

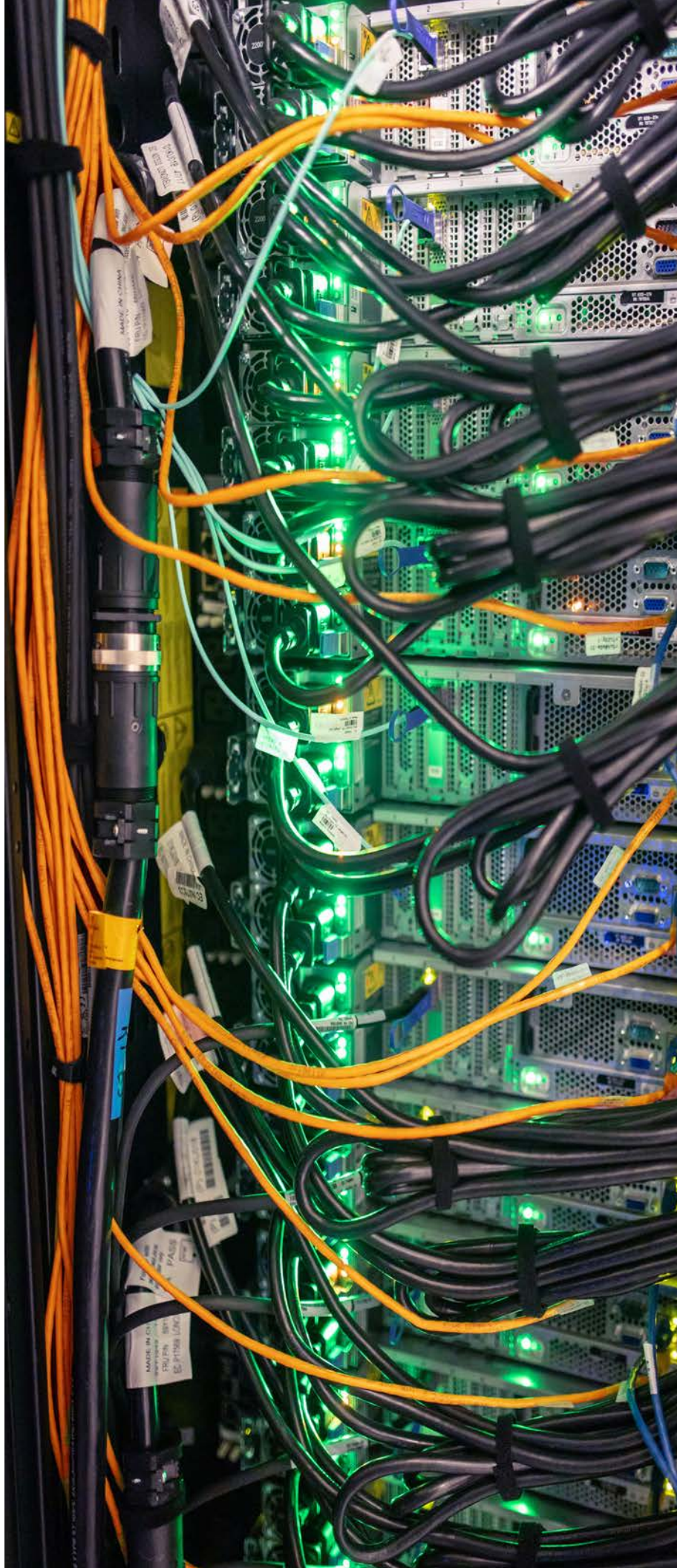


Table of Contents

1

Letter From the Director

Taking a Collaborative Approach
to Data Science

7

Letter From the Deputy Director

Data Science for Everyone

2

COVER STORY

Yelena Yesha

Joins UM as IDSC
Chief Innovation Officer

8

DATA ANALYSIS

CDC Weighs in on

Data Ethics During Covid-19

10

AUGMENTED REALITY

AR Application

Explores Spanish Colonial Paintings
and Architecture

4

APP DEVELOPMENT

xSAT Platform Launched

for Tracking and Early-Detection of
Covid-19 and other Outbreaks

18

MEDICAL DEVICE EPIDEMIOLOGY AND SURVEILLANCE

MDEpiNet and UM

Partner on New Medical Devices

6

LEADERSHIP

Jim Bottum to Lead

Strategic Initiatives for IDSC

10



20

LEADERSHIP

Data Ethics and Society

Director and Co-Director Appointed

22

BLOCKCHAIN

Fake News Detection

and Tracking Using Blockchain

27

NEUROTECHNOLOGY

Brain Investigators

Collaborative Initiative



Table of Contents

26

DATA VISUALIZATION

PCORI Awards

Interactive Evidence Map

Depicting Impact of Social Needs
Interventions on Health Outcomes

28

EDUCATION

New MS in Data Science

Degree Launches Collaborations

30

LEADERSHIP

Industry Advisory Board

Degree Launches Collaborations

32

DATA SCIENCE

Tel Aviv University

Partners with UM on Data Science

33

TECHNOLOGY PLATFORMS

IDSC Software Engineering

34

EXTENDED REALITY

Magic Leap Campus Tour

"The U Experience"

38

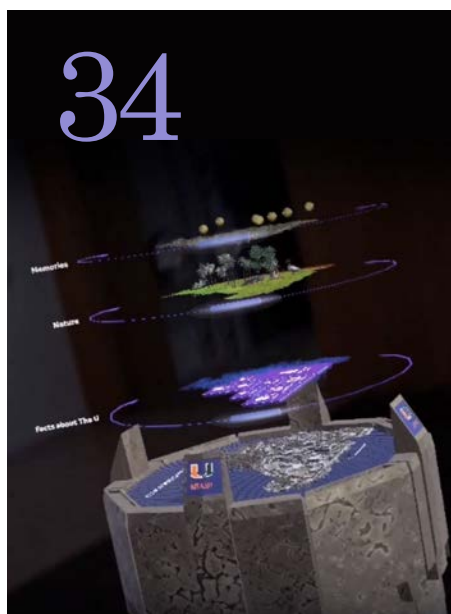
PHOTOS

IDSC Around Campus

40

TECHNOLOGY PLATFORMS

IDSC Advanced Computing



FROM THE DIRECTOR



Taking a Collaborative Approach to **Data Science**

Data science holds the key to tackling many of society's greatest challenges from COVID-19 to smart cities, social justice, and the global environment. Leading-edge computational approaches can extract hidden knowledge and generate fresh insights from large and complex datasets in many different sectors. That's why the University of Miami Institute for Data Science and Computing (IDSC) is taking a collaborative approach that leverages our state-of-the-art technology, including an AI-ready supercomputer and 5G+ edge computing environment.

As a member of UM's Frost Institutes of Science and Engineering, IDSC supports basic and applied research initiatives in schools and colleges across our University, sharing ideas, insights, and resources. IDSC is also launching new graduate and undergraduate student programs in data science, and building close ties with other U.S. and international academic institutions to develop educational, research, and community partnerships. IDSC's focus on collaboration extends to industry, government, and nonprofit partners who recognize the U's ability to provide valuable support. In that regard, I would like to thank our distinguished Industry Advisory Board members who are helping IDSC identify promising research directions.

IDSC welcomes the opportunity to explore how our powerful resources in data science and computing can help you achieve your research, training, and business goals.

A handwritten signature in black ink that reads "Nick".

Nicholas Tsinoremas, PhD

IDSC FOUNDING DIRECTOR
VICE PROVOST FOR RESEARCH COMPUTING AND DATA



Machine Learning and Neural Networks: Pushing the Boundaries of Artificial Intelligence

Machine Learning
conjunction
Break
con

Big DATA
vizUM2019
Michael
Mannino

4/1/2019

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

QUICK
Architects, etc.
(Please check county)
State House
and Blue
Project

COVER STORY

Yelena Yesha

Joins UM as IDSC Chief Innovation Officer

Yelena Yesha, PhD, an award-winning researcher and technology industry leader, has joined IDSC as Chief Innovation Officer and Head of International Relations. She was also named Visiting Distinguished Professor in the Department of Computer Science. “Dr. Yesha is an internationally recognized leader in many fields, including cybersecurity, big data analytics, medical research, electronic commerce, and climate change,” said IDSC Director Nick Tsinoemas. “She will play a key role in advancing our program, assisting our faculty, and engaging academic and industrial partners here and around the world.”

Dr. Yesha’s accomplishments in technology in the last 25 years, include leading initiatives for NASA, IBM, the National Institute of Standards and Technology (NIST), and the National Science Foundation (NSF). As Director of the Center of Excellence in Space Data and Information Sciences (CESDIS) at the NASA Goddard Space Flight Center, she oversaw the development of Beowulf—a high-performance parallel computing system now used in universities and research labs worldwide—and major components of the Linux operating system, which were later commercialized by Red Hat. Along with publishing 11 books as author or editor, Dr. Yesha has written more than 200 papers in refereed journals and conference proceedings, and she has been awarded more than \$40M in external funding. She is a Fellow of the IBM Centre for Advanced Studies, and received the Faculty Fellow of the Year award in 2011.

In the 1990s, Dr. Yesha represented the U.S. at the G7 Summit, leading the development of resources on electronic commerce, and examining its impact on policy, governance, and compliance. She later received funding from the European Union and NSF to build a Master of Science in Electronic Commerce program across Europe. From 1997 to 2005, Dr. Yesha was Editor-in-Chief of the International Journal on Digital Libraries, and she now serves as Editor-in-Chief of the journal Smart Homecare Technology and Telehealth.

Since 2004, Dr. Yesha has been a leader in bringing Data Science tools such as machine learning and AI to health care, improving physicians’ diagnostic capabilities, and advancing precision medicine. Currently, Dr. Yesha is Director of the National Center for Accelerated Real Time Analytics (CARTA), one of the Industry/University Cooperative Research Centers (I/UCRC) funded through a grant from the National Science Foundation (NSF).

Dr. Yesha is also a Distinguished University Professor at the Department of Computer Science and Electrical Engineering at the University of Maryland, Baltimore County. A native of the Ukraine, she received her BSc degrees in Computer Science and in Applied Mathematics from York University, Toronto, Canada, in 1984, and her MSc and PhD degrees in Computer Science from The Ohio State University in 1986 and 1989, respectively. ■

xSAT Platform Launched

for Tracking and Early-Detection of Covid-19 and other Outbreaks

A team at IDSC has developed a first-of-its-kind early-detection platform for COVID-19 that will enable local residents to self-report symptoms and researchers and decision makers to visualize data and identify hot spots. By tracking social media posts, analyzing public health data, and creating an interactive online dashboard, University researchers and others will have the ability to identify new clusters of COVID-19 cases in real time, rather than days or weeks after an outbreak.

"With COVID-19, we need to get ahead of the curve, not just flatten it," said IDSC Director Nick Tsinoremas.



"This important public health initiative is also designed to quickly identify new infectious disease problems in the future."

Funded with a rapid response grant from the Office of the Vice Provost for Research, the early-detection platform is being deployed in Miami-Dade County, but will expand to include data from other geographic areas.

"We want to provide health care leaders, physicians, and the public with timely data for making decisions," said Tsinoremas. "Our platform will complement the contact tracing systems that focus on individuals who test positive for the coronavirus."

A Web-Based Application

For the platform, the IDSC team built a web-based situational awareness app that makes it easier to explore the data related to an infectious disease outbreak, said Chris Mader, IDSC's Director of Software Engineering. "We are taking COVID-19 data from multiple sources and giving users a variety of ways to visualize the information," he said.



For instance, the dashboard can show the locations of recent cases sorted by age, gender, and other variables. It also can separate Florida residents from visitors to help determine if infections were related to travel. Residents may find the "Symptom Tracker" tool useful in seeing how the outbreak is affecting their neighborhood, while the application's "Emerging Clusters" feature could help decision makers direct tracking, tracing, and other resources. Each tool includes maps, graphs, tables, and interpretations of the data on an interactive dashboard.

"In terms of scale, we can cover the entire state for some types of data, or look at individual Miami-Dade neighborhoods for other information," Mader said, adding that the application can also generate alerts to indicate new cases. "We are bringing geospatial and clinical data together so they be examined at the same time."

Social Media Posts

Along with the clinical data, the early-detection platform brings in the human element through social media posts. “We are correlating the COVID-19 cases with feeds on Twitter, Instagram, Facebook, Reddit, and other sites,” said Joel Zysman, Director of Advanced Computing at IDSC. “We plan to also make a self-reporting application available for users of Apple and Android smartphones.”



To train the University’s Triton supercomputer to identify local COVID-related posts, Zysman said his team created a data set based on pandemic-related posts from New York. “Now that we’ve trained the machine on data we know is good,

even a few hundred Miami-Dade posts will allow us to draw meaningful conclusions,” he said. “There are many reasons one can have a fever or a cough, but if many people are feeling ill in certain neighborhoods, that’s a good indication for health authorities to take a closer look.”

Designed to reflect Miami-Dade’s demographic diversity, Zysman noted that the platform’s database includes Spanish and Haitian Creole posts, in addition to English. “We don’t want to over- or under-represent COVID-19 cases in any neighborhoods,” he said. “We are also being careful to adjust for population density, as there will be more cases in urban than rural areas.” Without IDSC’s supercomputing resources, Zysman added, the early-detection platform could not sort through the vast trove of de-identified clinical data and social media posts. “Triton (the University’s latest Supercomputer) provides the horsepower for applying machine learning techniques and artificial intelligence (AI) strategies to the early-detection issue,” he said. “In the emerging field of infodemiology, AI, natural language processing, and sentiment analysis can be used to track positive and negative affect, as well as geospatial clusters of symptoms.”

Engaging the Community

Dr. Tsinoiremas said the interdisciplinary project integrates expertise from a variety of fields, including computer science, information engineering, statistics, and data science. “We also want to mobilize the communities within the University, South Florida, health providers, and the public, to collaborate in the continued development and use of this powerful interactive platform,” he said. “We look forward to working with many partners and stakeholders to make this first-of-its-kind initiative the most useful it can be.” ■

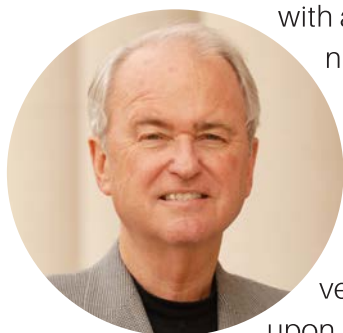


xsat.idsc.miami.edu

LEADERSHIP

Jim Bottum to Lead Strategic Initiatives for IDSC

IDSC welcomes James R. “Jim” Bottum as Director of Strategic Initiatives. In this role, he will be responsible for building collaborative alliances and partnerships with academia, industry, and community organizations.



“As I look at the national landscape of emerging data science initiatives, IDSC appears to have some unique qualities that I find very exciting. IDSC is being built upon the very successful foundation of the University’s Center for Computational Science (CCS), founded in 2007. In addition to the significant computational and data infrastructure this affords IDSC, CCS also built up a significant professional staff to assist researchers with a diverse set of large-scale data and simulation needs. Coupling these capabilities with IDSC’s forward-looking set of programmatic areas provides me a very rich base for developing strategic partnerships,” Jim said.

Prior to joining IDSC, Jim was Founding Director of the Center of Excellence in Next Generation Computing and Creativity, as well as a Research Professor in the Department of Electrical and Computer Engineering at Clemson University until his retirement in July 2019. (He continues as Research Professor Emeritus in the Clemson Emeritus College.) Jim is also an Internet2 Presidential Fellow, and consults with the American Indian Higher Education Consortium (AIHEC) on a National Science Foundation (NSF) grant to improve cyberinfrastructure at our Nation’s Tribal Colleges and Universities.

In addition, Jim was Vice Provost and CIO for Computing and IT at Clemson. From July 2006 to August 2016, he led Clemson’s efforts to build a state-of-the-art cyberinfrastructure for education, research, and service. These efforts resulted in Clemson becoming a Top 100 Supercomputing Site on the TOP500 world list, linking Clemson to the national research infrastructure, and bridging academia and IT staff together on innovative initiatives. Prior to Clemson, Jim was Purdue University’s first CIO beginning in August of 2001. And before Purdue, he was the Executive Director for the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign.

Jim was also the original Principal Investigator on the national Advanced Cyberinfrastructure Research and Educational Facilitation (ACI-REF) Project [NSF Award #1341935], a \$6 million dollar award to enable a national network of Advanced Cyberinfrastructure Research and Education Facilitators (ACI-REFs) to broaden the impact of advanced computing resources at 6 member campuses. This resulted in an NSF Research Coordination Networks program entitled the “Campus Research Computing Consortium (CaRC)” made up of 28 campuses from around the nation that provide a national forum for the exchange and dissemination of best practices, expertise, and technologies, and enabled the advancement of campus-based research computing activities. Jim has also served as an Expert for the NSF. ■

FROM THE DEPUTY DIRECTOR



Data Science for Everyone

Data science is rapidly becoming an essential discipline for students and adults. Understanding the construction of datasets, the use of analytic tools, and the assumptions that go into computational models are vital skills in science, business, and the humanities. In atmospheric and marine science, for example, data science tools are helping us improve hurricane forecasts, and better understand the impacts of sea level rise and climate change.

We believe data science needs to be more than a “black box,” accessible only by computational experts with years of specialized training. Instead, Data science concepts and skills need to be offered to students of all ages, from middle and high schoolers to college and university students, to adults in a wide range of professions.

In the past year, our educational program has taken important steps in that direction, as the Center for Computational Science (CCS) has been incorporated into the Institute for Data Science and Computing (IDSC). This fall, we are offering a new Master of Science in Data Science program. While initially offered through our virtual learning platform, this graduate-level program will include an internship experience with our industry partners. We are also planning a new undergraduate course, “Data Science for Everyone,” designed to introduce UM students to this fascinating, evolving field.

Please join us on this journey as we strive to make data science literacy an essential aspect of 21st century society.

A stylized, handwritten signature of Ben Kirtman in black ink.

Ben Kirtman, PhD

IDSC DEPUTY DIRECTOR
DIRECTOR, IDSC EARTH SYSTEMS

DATA ANALYSIS

Data Ethics + Covid-19

UM-CDC Panel Discuss Challenges

From contact tracing to communicating with the public, the COVID-19 pandemic presents ethical challenges to data professionals. “Good science depends on producing, understanding, analyzing, and communicating data, and then vetting it with other scientists,” said Nick Tsinoremas, IDSC Director. “With COVID-19, the timeline is very compressed, creating both practical and ethical challenges for data scientists at every step of the process.”

Dr. Tsinoremas moderated a July 23, 2020, online discussion on “Data Ethics During COVID-19” with: Brian Lee, Senior Advisor, Informatics, Centers for Disease Control and Prevention (CDC) Office of the Chief Information Officer; Kenneth Goodman, PhD, Founder and Director, UM Institute for Bioethics and Health Policy, and Director, Data Ethics and Society, IDSC; and Soyeon Ahn, PhD, Chair and Professor, Department of Educational and Psychological Studies (EPS) in the School of Education and Human Development.



More than 200 faculty, students, and professionals attended the virtual discussion, which was hosted by IDSC, the UM Institute for Bioethics and Health Policy, and UM Ethics Programs. Michael Mannino, PhD, IDSC Director of Programs, organized the event.

“With COVID-19, the more information we have, the

more lives we can save,” said Dr. Goodman. “But we are not doing a very good job of gathering essential data, or analyzing it in a way that engenders trust with the public.”

Collecting and Analyzing Data

Dr. Tsinoremas remarked ethical issues come into play when collecting COVID-19 data, such as different reporting systems used by cities, counties, and states. “It is very challenging to have multiple sources of data from populations with different attributes,” said Dr. Ahn, who leads the UM Research, Evaluation, and Measurement program. “Another issue is that the people collecting data may not be applying the same standards or understand the consequences of their processes. That increases the difficulty of harmonizing all this information.”



From the CDC’s perspective, Mr. Lee said that variety of data feeds is one of the public health organization’s biggest challenges. “Our colleagues are working on validating the collection processes and data fields so we can have ‘apples to apples’ comparisons,” he said. “This certainly is not as simple as analyzing one set of data collected over a decade.” Mr. Lee said CDC professionals are addressing the issue of determining what data is most important and useful for an intended audience. “We want to produce information that can be easily understood by the public, while providing

information about the lineage of the data for public health professionals,” he said. “We are working with stakeholder groups to determine which information should be given the most priority.”

Once the data has been gathered, writing the analytical software or preparing a database needs to be done with veracity, transparency, and accountability, said Dr.

Goodman. That’s particularly important with COVID-19 as different types of data become available.

Dr. Ahn said that analysis of evolving COVID-19 information may require bringing in professionals with different data skill sets, such as what to add as variables, and how to process the content.



Mr. Lee stated much of the CDC’s work goes into designing and developing transparent data sets. “We want anyone in the world to be able to see how the datasets have been produced, linked, and cleaned,” he said. “As sources change or fields are added, we need to have a clear audit trail—not just to confirm the validity, but to gain the extra meanings from the data.” Dr. Goodman added that the CDC has been a “trusted broker” for providing information during the pandemic. “The CDC has gotten things right, although it has been vastly under-resourced,” he said. “Our public health departments are also doing a good job with their local data.”

Contact Tracing

Back in 1854, John Snow, one of the founders of modern Epidemiology, tried to understand a cholera outbreak in London by tracing individual cases. He put dots on a map where people were getting sick and was able to identify contaminated wells in the neighborhood, explained Dr. Goodman. “Contact tracing can be a great public health tool.” “But ethical issues also come into play,” said Dr. Tsinoresmas, adding “How do we balance the desire for personal privacy with protecting the public?”

One approach is for public health agencies to set clear ground rules on how COVID-19 data will be collected and used, said Dr. Goodman. “Trust is vital for managing the process,” he said. “However, many people feel their mobile devices are under surveillance for marketing purposes. The big tech companies need to address this issue in order to mitigate worries about a robust contact tracing process.”

Communicating With The Public

Another daunting ethical issue for public health professionals is communicating COVID-19 findings to the public, said Dr. Ahn. “We need to present the data so it can easily be understood and interpreted.” For example, a data chart should not be compressed horizontally or vertically to highlight a COVID-19 finding or trend. Dr. Tsinoresmas pointed out that many people are looking for simple, binary answers to questions like, “Should I get a COVID-19 test or not?”

Responding to that question, Dr. Goodman said it is very difficult to communicate scientific findings when they are expressed as probabilities. It’s even more difficult in the contentious U.S. political climate. As he said, “We have done a terrible job in conveying the importance of simply wearing a mask. It is against that background that we need to think about how we can best communicate the importance of public health measures to the public.” ■



Catch the Replay

youtube.com/watch?v=Sn1vxasODa0

AUGMENTED REALITY

AR Application Explores Spanish Colonial Paintings and Architecture





Nuestra Señora de la Merced Chapel
at Corpus Christi Catholic Church
Allapattah, Miami

University of Miami art history students have access to an augmented reality (AR) application to explore Colonial Spanish paintings and architecture, thanks to a collaboration between IDSC and the College of Arts and Sciences.

Building on the University's partnership with Magic Leap, this advanced AR application opens the door to virtual studies of the large collection of Colonial art at Nuestra Señora de la Merced Chapel at Corpus Christi Catholic Church in Miami.

"The La Merced Chapel is home to an extraordinary collection of donated art, and I have taken prior classes there to study the paintings," said Karen R. Mathews, Associate Professor of Art and Art History. "Through the Provost's initiative and funding from the College



of Arts and Sciences, this leading-edge research project allows us to bring the Chapel to students on campus, as well as audiences around the world—an important consideration in the time of COVID, when so much learning is done virtually."

Located in Allapattah, a neighborhood to the NW of downtown Miami, the Chapel reflects the dream of Corpus Christi's long-time pastor, Father José Luis Menéndez, to recreate the spirit of an old Peruvian church. Construction began in 2005 on La Merced Chapel, which houses an expanding collection of 200-plus works from throughout South and Central America, and the Caribbean.

UM Art students and IDSC professionals began collaborating in 2019, and the AR application was completed during the spring 2020 semester, despite the disruptions related to COVID-19. "We used drones and LiDAR laser scanning technology to map the Chapel's interior

and exterior, while collecting high-resolution photos of the paintings," said Chris Mader, IDSC Director of Software Engineering. "Next, we used Magic Leap's platform, along with the gaming engine Unity, to create a detailed interactive experience."

Mathews added that the AR application creates an immersive experience with detailed information on five of the Chapel's paintings, as well as its architecture. "By clicking on points of interest, you can open an audio and a text block—an ideal approach for students and adults with different learning abilities," she said.



Unlike a virtual reality (VR) experience, the AR app allows the students to control their interactions with the Chapel and its artwork. "You can walk around a model of the exterior of the Chapel, and zoom in to see the interior and the paintings. You can select a painting, take it out of the Chapel, and place it on a wall in the real-world room you're currently in to see it life size, or bring out another painting for comparison. There is so much educational potential in this application, which offers a different way to appreciate great art."

Mader said the project demonstrates IDSC's ability to produce an end-to-end interactive digital experience. "We have been creating three-dimensional maps, models, and reconstructions models for a variety of purposes," he added. "We are also developing a course for the School of Communications that uses 3D for storytelling."

"We come to IDSC with ideas, and they say, 'Let's go!'"

The art history AR application is just the latest



point cloud created using senseFly Albris drone

collaboration between Mathews and the IDSC team. The IDSC Software Engineering team includes Amin Sarafraz, PhD, a Research Assistant Professor of Civil, Architectural, and Environmental Engineering whose research interests include Machine Learning, Photogrammetry, and Computer Vision. "We have worked together for more than four years, on a variety of projects relating to the Digital Humanities," Mathews said. "For example, they created a new algorithm to remove distortion from aerial drone photos and obtain crisp, clean outlines of architectural structures. The knowledge and experience of IDSC's data and computing professionals has been fundamental to our success. We come to IDSC with ideas, and they say, 'Let's go!'" ■



Nuestra Señora de la Merced Chapel Augmented Reality Tour

Art Historical Content Created By
Spring 2020 ARH 270-Q Students

TOOLS

Magic Leap 1 Creator Edition

Unity 2019.2

Maya 2020.1

Blender 2.8

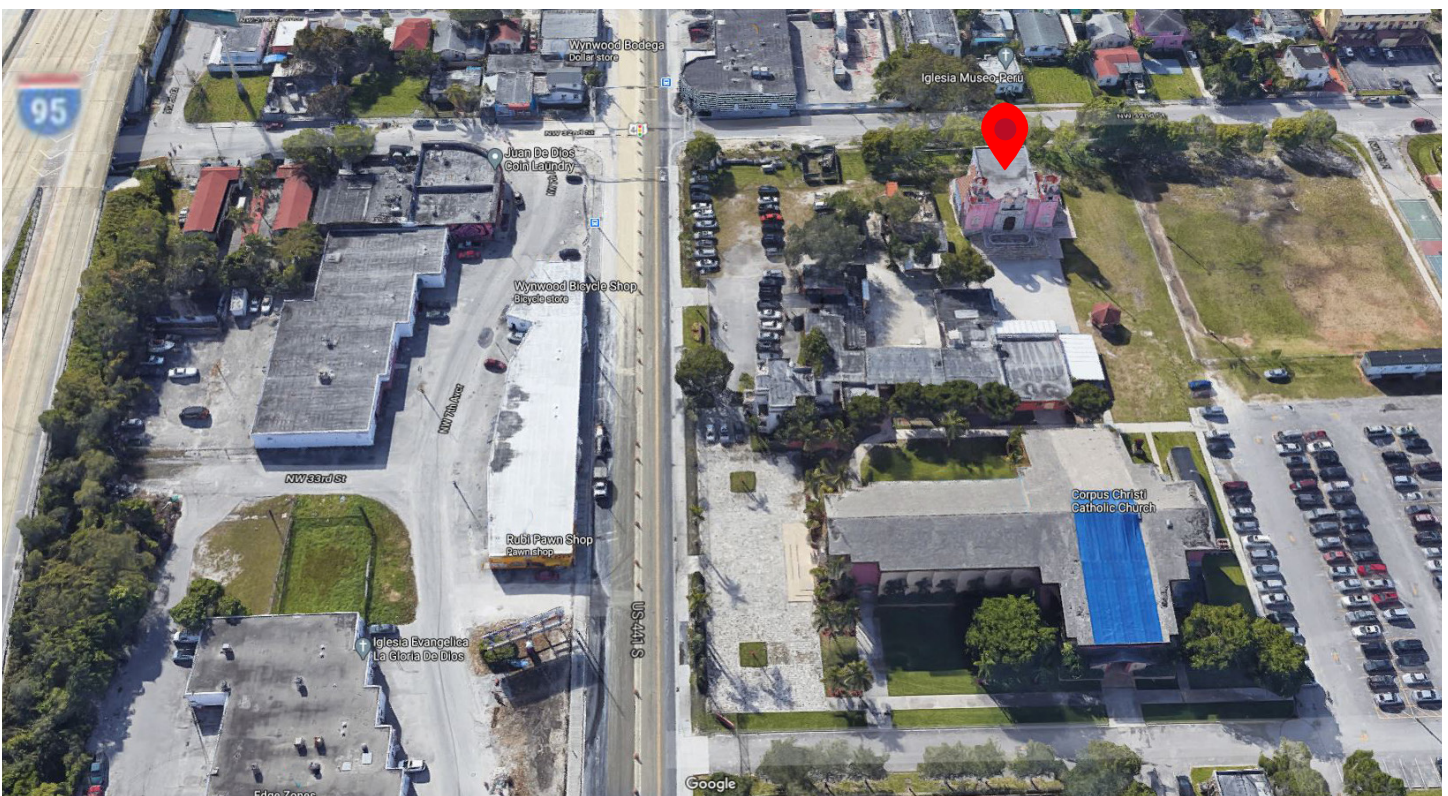
Adobe Illustrator

Adobe Photoshop

Leica RTC 360 Laser Scanner

Nikon DSLR Camera

SenseFly Albris Drone





RETABLO

The retablo at Nuestra Señora de la Merced Chapel is created in the Andean Baroque style, where the local flora and fauna of Peru are accompanied by Christian iconographic elements. Retablos were developed to aid those who could not read the Bible, nor understand the Latin Mass.





MEDICAL DEVICE EPIDEMIOLOGY AND SURVEILLANCE

MDEpiNet and UM

to Collaborate on New Medical Devices

By joining a national collaborative partnership, the University of Miami Institute for Data Science and Computing (IDSC) will contribute to the analysis and evaluation of new medical devices designed to improve patient care. "Our IDSC faculty will share their extensive data skills and knowledge of the health care industry as a new partner of the Medical Device Epidemiology Network (MDEpiNet)," said Nicolas Tsinoremas, PhD, Director of the Institute, who recently entered into a memorandum of understanding with MDEpiNet.

MDEpiNet is a global public-private partnership that brings together leaders in health care, academic medical centers, patient groups, payers, and government, to advance a national patient-centered medical device evaluation and surveillance system.

"We are excited to work with IDSC to conduct pilot and demonstration projects relevant for big data security and research," said Art Sedrakyan, MD, PhD, Director of MDEpiNet's Coordinating and Science Infrastructure Center, and Professor of Healthcare Policy and Research, leading the Institute for Health Technologies and Interventions at Weill Cornell Medicine in New York.



research, and numerous national and international coordinated registry networks for technology research and surveillance."

Yelena Yesha, PhD, UM Visiting Distinguished Professor and IDSC Chief Innovation Officer will serve as a Co-Chair of MDEpiNet's Artificial Intelligence (AI) and Blockchain task force, and Dr. Tsinoremas will be Co-Chair of the partnership's COVID-19 rapid response task force.



Since its establishment in 2010, the MDEpiNet Coordinating Center at Weill Cornell Medicine supports activities under a cooperative agreement with the U.S. Food and Drug Administration (FDA), and the Center for Devices and Radiological Health.

MDEpiNet's objectives include:

- /// Advancing the development and testing of new approaches to patient-focused medical device evidence evaluation
- /// Improving how medical device information is generated, synthesized, and appraised throughout the life cycle of a device
- /// Facilitating broad-based collaboration as a part of the learning health care ecosystem to harness existing investments in real-world data systems for medical device evaluation



/// Building a strategically Coordinated Registry Networks (CRN) infrastructure through a collaborative CRN Community of Practice, and

/// Developing methodologies to support the use and creation of real-world evidence.

"We look forward to defining collaborative projects that will allow us to accelerate the evaluation of medical devices in terms of safety and efficacy," said Dr. Yesha. "This new collaboration will support the evidence-based development and assessment of medical devices throughout the health care sector." ■



LEADERSHIP

Data Ethics and Society

Director and Co-Director Appointed

Kenneth W. Goodman, PhD, and Otávio Bueno, PhD, have been named Director and Co-Director of Data Ethics and Society for the University of Miami Institute for Data Science and Computing (IDSC).

Kenneth W. Goodman, PhD, FACMI, FACE

Dr. Goodman is Founder and Director of the UM Miller School of Medicine Institute for Bioethics and Health Policy, which has been designated a World Health Organization (WHO) Collaborating Center in Ethics and Global Health Policy (one of 12 in the world). He is also Co-Director of University of Miami Ethics Programs, integrating ethical, legal, and social issues into UM initiatives in many disciplines. In addition, Dr. Goodman also directs the Florida Bioethics Network,

and chairs the UHealth University of Miami Hospital Ethics Committee and the Adult Ethics Committee for Jackson Memorial Health System. Academically, he is a Professor of Medicine at the Miller School with appointments in the Departments of Philosophy, Health Informatics, Public Health Sciences, Electrical and Computer Engineering, Anesthesiology, and the School of Nursing.

Along with his UM roles, Dr. Goodman is a Co-Founder of the North American Center for Ethics and Health Information Technology (a partnership with the Center for Bioethics at Indiana University). He is past Chair of the Ethics Committee of AMIA (American Medical Informatics Association), a Fellow of the American

College of Medical Informatics (FACMI), and, a Fellow of the American College of Epidemiology (FACE) and a past Chair of its Ethics Committee.

Dr. Goodman's research has emphasized issues in health information technology, and in epidemiology and public health. His latest book, "Ethics, Medicine, and Information Technology: Intelligent Machines and the Transformation of Health Care," identifies and analyzes issues in biomedical informatics.

Otávio Bueno, PhD

Dr. Otávio Bueno is a Professor, Chair, and the Cooper Senior Scholar in Arts and Sciences in the University of Miami Department of Philosophy. He has held visiting professorships or fellowships at Princeton University, University of York (UK), University of Leeds, and the University of São Paulo. His research focuses on the philosophy of science, philosophy of mathematics, philosophical logic, metaphysics, epistemology, and philosophy of art.

Dr. Bueno has published more than 200 papers in journals such as *Noûs*, *Mind*, *The British Journal for the Philosophy of Science*, *Philosophy of Science*, *Philosophical Studies*, *Synthese*, *Journal of Philosophical Logic*, *Studies in History and Philosophy of Science*, *Analysis*, and *Erkenntnis*. He is the co-author of "Applying Mathematics: Immersion, Inference, Interpretation," and Editor of "Individuation, Process, and Scientific Practices," among other books. He is also an Editor-in-Chief of *Synthese*.

"From personal privacy to fake news, legal, ethical, and social concerns permeate the research, teaching, and applications of data science and computing," said IDSC Director Nick Tsinores. "We were very fortunate to engage these two distinguished academic leaders in the field of ethics who will help guide the responsible growth and development of IDSC's Data Ethics and Society program." ■



BLOCKCHAIN

Fake News Detection and Tracking Using Blockchain

UM Visiting Distinguished Professor and IDSC Chief Innovation Officer Yelena Yesha, PhD, is launching a collaborative blockchain project to detect and track fake news by identifying the source in real time. “The coronavirus pandemic has led to an explosion of misinformation, such as ‘miracle cures’, as well as scammers trying to take advantage of people, and others who spread rumors for fun,” said Dr. Yesha. “As information spreads quickly in social media, it is an urgent task to develop methods for preventing the spread of fake news.”



Dr. Yesha will collaborate with her colleagues at IDSC and at CARTA, the Center for Accelerated Real Time Analytics, to develop a process using blockchain to determine the origin of suspected fake news articles. Dr. Yesha is currently the Director of CARTA, one of

the Industry/University Cooperative Research Centers funded through a grant from the National Science Foundation (NSF).

“Early on, the use of blockchain was mostly in the financial sector,” said Dr. Yesha. “Now, because of its low cost and high security, the use of blockchain for authentication is receiving rapidly growing interest in many fields. By applying blockchain to social media communications we hope to authenticate information that is critical to human welfare.”

Blockchain is a modern system for authenticating various types of transactions by comparing ledgers posted to a decentralized group of computers. Each transaction—such as a social media post—has a time stamp. With the use of a cryptographic encoding, time stamps, and data in a distributed network, any forgery of data can be quickly detected, according to Dr. Yesha.

While many algorithms have been proposed for blockchain, the new initiative will use Chios, which offers fine-grained access control. Dr. Yesha’s team will develop a computer program demonstrating how to capture fake news using Chios, and a set of experimental results to show the effectiveness of blockchain in tracking suspect posts.

“Leveraging cutting-edge, IDSC can be a leader in authenticating social media communications,” said Dr. Yesha. “An effective blockchain tool can play a vital role in combating the spread of fake news.” ■

NEUROTECHNOLOGY

Brain Investigators

Collaborative International Initiative

Researchers from IDSC are exploring the interface between the human brain and technology through a collaborative international initiative. “We are working closely with scientists from Europe and Israel in fields like medical informatics, brain-computer interfaces, and biomarkers for diseases like COVID-19,” said Yelena Yesha, PhD, UM Visiting Distinguished Professor and IDSC Chief Innovation Officer. “These novel interfaces allow people to interact with the environment by directly processing brain signals, thus bypassing the natural pathways of nerves and muscles.”

In her role at IDSC and as Director of CARTA, Dr. Yesha is collaborating on brain modeling applications with Mira Marcus-Kalish, PhD, Director of International Research



Collaborations at Tel Aviv University in Israel. Dr. Yesha helped organize the 2020 BRAIN Initiative®

Investigators Meeting, a virtual global conference held in June. “The Conference provided a forum for discussing exciting scientific developments and potential new directions, and identifying areas for collaboration and research coordination,” said Dr. Yesha. She added that CARTA’s contribution to the initiative could include collaboration with medical centers for recipients of prosthetics, access to medical data of the South American and African-American populations, and research from The Miami Project to Cure Paralysis.

Other UM participants from the BRAIN meeting were

IDSC Education Director Dr. Mitsunori Ogihara, who moderated a session on the “Medical Informatics Platform (MIP),”



including Data Sharing, Cybersecurity, and Cloud Computing. Odelia Schwartz, PhD, Associate Professor of Computer Science and Director of the UM Brain and Machine Learn-

ing Laboratory, moderated a session on “Biomarkers.” Faculty members from several leading universities discussed “Computational Modeling and Human Brain Simulation,” and “Closed-loop AI-NeuroRobotics” as well as medical informatics and biomarkers.



The 2020 BRAIN Conference was hosted by the Building Reliable Advances and Innovation in Neurotechnology (BRAIN) Center, an I/UCRC at Arizona State University, and the University of Houston. “Our goal is to support rigorous testing of the efficacy, safety, and long-term reliability of neurotechnology that would not be otherwise possible within the traditional ‘silos’ of academic, industry, regulatory, and clinical communities,” said



José Luis Contreras-Vidal, PhD, Professor of Electrical and Computer Engineering at the University of Houston.



DATA VISUALIZATION

PCORI Awards

Evidence Map Depicting Impact of Social Needs Interventions on Health Outcomes

Data specialists at IDSC are collaborating with national consulting firm MDB, Inc., in designing and developing an interactive evidence map displaying the impact of social needs interventions on health outcomes. "Our multidisciplinary UM team



will effectively translate scientific findings and data into a visual evidence map to help physicians, researchers, and health insurance systems see patterns that otherwise would not be evident," said Alberto Cairo, PhD, IDSC Visualization, Data Communication, and Information Design Director.

work for various populations, opening the door to improved health outcomes," said Baker, whose firm works with the U.S. Department of Health and Human Services (HHS), and other Federal agencies.

Last fall, Baker reached out to UM's professionals at IDSC and the School of Communication to prepare a proposal for the leading-edge national project, and he received approval in May. "PCORI will provide the research data on social needs interventions, and we will bring that information to life," said Baker. "Our team blends UM faculty, graphic designers, web developers, and user experience experts to deliver a clear and user-friendly interactive evidence map to PCORI."

Michael D. Baker, founder of MDB, Inc., leads the collaborative team in the project:



"Social Needs Interventions and Health Outcomes: An Evidence Map" for the Patient-Centered Outcomes Research Institute (PCORI). A Washington, DC, nonprofit launched in 2010, PCORI funds

studies that can help patients and those who care for them make better-informed healthcare choices. "Data visualization in this evidence map will empower communities, health systems, purchasers, payers, and other stakeholders by depicting which interventions

Baker said a group of researchers will conduct a thorough search of the literature on social needs interventions, and will prepare their findings for visualization. Then, Dr. Cairo will guide the design, development, and testing of the interactive evidence map, which will consist of several data visualizations. "This involves visually mapping quantities using properties such as height, length, position, and color to bring out patterns and relationships within the data," said Dr. Cairo. "Effective design visualization reflects both the purpose of the tool and its users, and the graphic elements need to convey the information in an accurate, understandable manner."



Other UM professionals include:

/// Christopher Mader, Director of IDSC's Software Engineering team, will assist with the design, development, and programming of the evidence map.

/// Lenny Martinez, a designer and engineer at the School of Communication, will be the main developer, and

/// Barbara Millet, PhD, Director of the UM User Experience (UX) Lab, and Assistant Professor of Interactive Media at the School of Communication, will guide the user testing.

"The goal of an evidence map is to facilitate evidence-informed decision making for clinicians and their patients," said Baker. "We are confident this important initiative will achieve that goal." ■



Chris Mader



Lenny Martinez



Barabara Millet

EDUCATION

New MS in Data Science Degree Launches Collaborations

From cybersecurity to applying artificial intelligence in Business, the University of Miami Institute for Data Science and Computing (IDSC) is launching a wide range of collaborative educational programs.

“Being able to analyze data and interpret the results is now a basic skill, like being able to read and write.”

“We believe data science skills are important for successful careers in many fields,” said Mitsunori Ogihara, PhD. Dr. Ogihara is a Professor of Computer Science,

Director of IDSC Workforce Development and Education, and Interim Director of IDSC AI and Machine Learning. “Being able to analyze data and interpret the results is now a basic skill, like being able to read and write.”



Dr. Ogihara said IDSC is working with schools and colleges across all UM campuses to develop data science classes and mini-courses tailored to the learning needs of students planning careers in medicine, business, science, and other disciplines. “There is a misconception that a data scientist should be able to do everything,” he said, “But there are specializations within this field, and we want to open the door for students to explore those learning opportunities.”

The Master of Science in Data Science program begins with the fall 2020 semester. This new graduate program offers four specialty tracks, and includes a professional internship.

- /// Technical Data Science
- /// Marine and Atmospheric Science
- /// Data Visualization
- /// Smart Cities

The University will also be offering a new undergraduate course entitled “Data Science and Computing for Everyone.”

Later this year, IDSC plans to offer IBM Skills Academy training in data science, AI, blockchain, quantum computing, and cybersecurity. Participants in this “train the trainer” program will include UM faculty members who will receive an IBM digital badge upon completion. “We hope to customize this course by incorporating IDSC’s resources, such as special data sets or our supercomputers,” added Dr. Ogihara.

IDSC is also developing an executive artificial intelligence course in collaboration with the Miami Herbert Business School, said Michael Mannino, PhD, IDSC Director of Programs. “We are building partnerships with other academic institutions and business organizations, including the Miami-Dade Beacon Council, to develop the skilled STEM workforce of the future.”

IDSC is also working to expand the data science edu-

cational pipeline in several ways, said Dr. Mannino. For instance, IDSC faculty members will be working with minority high school students in the Breakthrough Miami program this fall, as well as high school students from Ransom Everglades High School. Other learning partnerships are planned for later this year.

IDSC is also advancing an articulation agreement with Miami Dade College for students interested in data science careers. "After earning a Bachelor's degree, they would enter our Master's program, and take advantage of our internship opportunities," said Dr. Mannino. "We

believe this coordinated initiative will open the door to career opportunities here in South Florida for talented STEM students."



Looking ahead, the IDSC team is applying for a collaborative National Science Foundation (NSF) grant for a regional cybersecurity workshop with UM, Florida International University, and Miami Dade College. The focus would be "Post Disaster Smart Response and Resilience in Critical Infrastructure Security and Data."

Dr. Mannino believes this type of collaborative workshop can leverage each institution's strengths, such as UM's resources in fields like supercomputing and deep learning. "Our region is affected by hurricanes, sea-level rise, and many other infrastructure issues," he said. "By taking an integrated approach, our institutions can play a greater role in addressing these challenges, and finding potential solutions." ■



NEW DEGREE

Master of Science in Data Science

This degree provides interdisciplinary connections and experiential learning opportunities across all aspects of data science and computing, from machine learning to marine science, city planning, or communications.

Students from any academic discipline are invited to explore advancing their careers with foundational knowledge on the applications and implications of data in a variety of fields.

For more information, please contact the Office of Interdisciplinary and Professional Studies at 305.284.8783.

Data Scientist

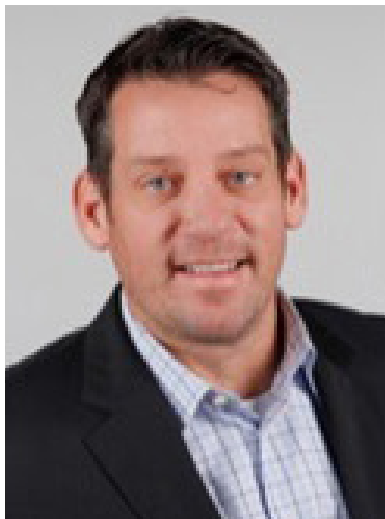
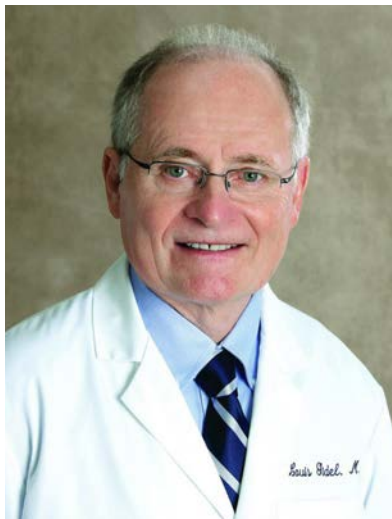
"The sexiest job of the 21st century."

-HARVARD BUSINESS REVIEW

UNIVERSITY
OF MIAMI



msdatascience.miami.edu



LEADERSHIP

Industry Advisory Board

Advances IDSC Mission

A team of distinguished technology professionals is advancing the collaborative mission of the University of Miami Institute for Data Science and Computing (IDSC) by serving on the Industry Advisory Board.

"We are committed to making South Florida a hub for the data sciences and integrating leading-edge tools and applications into decision-making processes for all industries," said Nick Tsinoremas, IDSC Founding Director and Vice Provost for Research Computing and Data. "Our valued members of the Industry Advisory Board support our research, education, and commercialization initiatives in the Western Hemisphere, and around the world."

The Board Members include:

/// **Matthew Denesuk**, Senior Vice President, Data Analytics & AI, Royal Caribbean Cruises, Ltd.

/// **Laura Gabrysiak**, Data Science Manager at Visa and Founder, R-Ladies Miami

/// **Louis Gidel**, PhD, MD, Chief Medical Informatics and Quality Officer, Baptist Health South Florida

/// **Jonathan Hammond**, Head of Sales, North America Commercial Enterprise & Education, Adobe Digital Media Platform and Solutions

/// **Roy Lowrance**, Chief Data Scientist, Autonomous Professional Development, serves as Chairman of IDSC's Industry Advisory Board. He has designed and

developed artificial intelligence applications that help adult learners achieve their educational objectives. He is also Founder and CEO of Applied Data Science, LLC, in New York.

/// **Pete Martinez**, Chairman and CEO, Game Changer Tec, LLC, and CEO, Sivotec Analytics

/// **Kevin McKenzie**, Vice President for Information Technology and Chief Information Security Officer, Dollar Tree

/// **Robert Moniz**, PEng, President, GlassHouse Systems, US, is Vice Chairman of the IDSC Industry Advisory Board. His company is a leading enterprise IT solution provider.

/// **Fabio Ribeiro**, General Partner, TUZ Ventures, and Chief Technology Officer, Aura Minerals, Inc.

/// **Yuda Saydun**, President, Cyvent, a cyber security solutions provider

"Our Industry Advisory Board Members will help catalyze IDSC's data-intensive research focused on the needs of the region," said Dr. Tsinoremas.

"Through interdisciplinary collaborations with our industry partners, we can address today's pressing societal challenges, and advance individual, family, and community well being." ■

DATA SCIENCE

Tel Aviv University

Partners with UM on Data Science

A new international partnership between IDSC and Tel Aviv University in Israel will open the door to collaborative research, learning, and cultural initiatives.

"We are looking forward to creating exciting opportunities for our researchers, faculty, and students, to expand their horizons," said Nick Tsinoremas, IDSC Director, who recently signed a memorandum of understanding with Tel Aviv University (TAU).

"This international partnership, across continents with special focus on data science, is very timely these days while we are trying to understand the universe and human wellbeing," said Yaron Oz, Professor and Provost, Tel Aviv University. "The goal is to provide a broad picture of the human body functioning in its surrounding, while converging knowledge, data and technologies. The data science





can provide us with the tools to combine and analyze the micro and macro environmental features in a secure and safe mode, providing reliable outcomes towards translational research and development."

Founded in 1956, TAU is Israel's largest and most comprehensive institution of higher learning and research with 125 schools and departments across the spectrum of science, humanities, and the arts, all located in one campus enabling the convergence and

cross disciplinarity of science & technology. It is also Israel's biggest bio-medical research and teaching complex and has 128 research centers.

"Interdisciplinary collaboration is a core value of the academic culture at both UM and TAU," said Dr. Yelena Yesha, UM Visiting Distinguished Professor and Chief Innovation Officer, IDSC. "We look forward to establishing a framework for mutually beneficial collaboration." For example, IDSC's resources in supercomputing and informatics could accelerate TAU's drug discovery program, according to Dr. Yesha. "We can help their biomedical researchers identify potential drug targets, develop new pharmaceuticals, and reposition existing drugs," she said. "That work could accelerate the commercialization of new therapies and benefit patients around the world."

Along with a variety of research partnerships, other prospective areas of IDSC and TAU's collaboration include academic seminars, exchange programs for faculty, students, and staff, and cultural and artistic activities. ■



IDSC

Software Engineering



IDSC's professional software engineers actively seek collaborative partners for new and innovative software application and systems development projects. Core competencies include:

- Software Application Conceptualization, Design, Implementation, and Project Management
- AI and Machine Learning
- Computer Vision, Photogrammetry, and 3D Reconstruction
- Drones and Aerial Surveys with a Focus on Urban Spaces
- Extended Reality XR (Augmented AR, Virtual VR, Mixed MR)
- GIS and Geospatial Application Development
- Multi-Tier Web-Based Application Development
- Participatory Mapping + Community-Centered GIS Development
- Search/Complex Data
- Semantic Web
- Spatial Surveying and Architectural Documentation

IDSC Software Engineering offers expertise for collaborators who need to include novel software systems as part of their projects, including expert personnel for inclusion in grant proposals, and the development of prototypes or initial analysis in preparation for proposal submission.



305.243.4962 | idsc@miami.edu
idsc.miami.edu/platforms/sweng



“ The benefits of XR include increased content understanding, better grasp of spatial structures, long-term memory retention, and increased student motivation.

EXTENDED REALITY

The U Experience

Magic Leap Campus Tour

By combining their creativity with powerful computing tools, University of Miami (UM) graduate students Maria Aguilar and Manouj Govindaraju crafted an extended reality (XR) application to welcome incoming freshman. Now, campus newcomers will be able put on a Magic Leap 1 set and 'walk' through the campus, learn about academics, athletics, and other topics, and listen to UM students talking about their fondest memories.

"Today's Generation Z students can get bored with conventional orientation programs and campus tours, so we wanted to engage them through an exciting, immersive experience," said Manouj, who graduated with Maria in May with a Master of Fine Arts (MFA) degree.

For Maria, creating an interactive XR application was a "thrilling" way to use powerful computing and data tools. "It will help new students make a deep connection with the University, inspire the new generation, and seed their 'Canes love."

Launched by UM Student Affairs and supported by IDSC, "The U Experience" combines real-world and virtual environments in an interactive XR application that goes beyond virtual reality (digital only) and augmented reality, which adds a digital dimension to real-world video.

"This is a phenomenal multidisciplinary project that brings students, faculty, and research staff together,"

said Nick Tsinoremas, IDSC Founding Director and Vice Provost for Research Computing and Data. "It demonstrates that that XR coupled with artificial intelligence and powerful computing represent how we will all be interacting, learning, and creating knowledge in a hybrid physical and digital world."

Maria and Manouj looked at the main concerns of Generation Z students and their families about college life, and designed and developed the XR application in keeping with UM initiatives for student orientation and retention, according to Prof. Kim Grinfeder, Director of the School of Communication Interactive Media Program. "From the outset, we wanted to provide a collaborative, forward-thinking project that allowed our students to focus on what's next in computing." He added "The ability to translate knowledge into a digital product is one of our priorities and it's great to see it come together in such an innovative package."

Phase one of The U Experience was tested in the Magic Leap Lab at the Richter Library last August. "That gave us a great opportunity to try the first version of the app with users, learn from them, and come up with this new version," said Maria. "The support we received from IDSC and our advisors from the Interactive Media Program was amazing."

IDSC provided technical support including access to the University's supercomputer. "The team used a LiDAR (Light Detection and Ranging) laser system to measure distances across the University, and provided

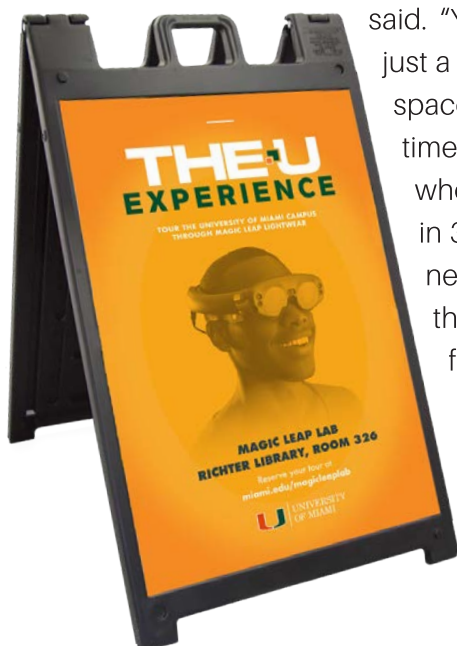
us with the generated 3D mesh, which we were able to directly plug into the application,” said Manouj. “The scale of the project would not have been the same, if not for the IDSC’s computing resources.”

Maria noted that the benefits of XR include increased content understanding, better grasp of spatial structures, long-term memory retention, and increased student motivation, and that XR applications can significantly change the way information is delivered to college students.

“This project provides opportunities for future development, such as adding more layers of information, exploring new interactions with data visualizations, and testing the experience in other platforms,” she said. “It also opens up opportunities for evaluation and comparison with traditional programs for freshmen orientation.”

Both Maria and Manouj felt the XR project was a powerful learning experience, helping them develop their data science skills, while contributing to the future of the University. “When designing an extended reality app, there seem to be a million possibilities,” Maria

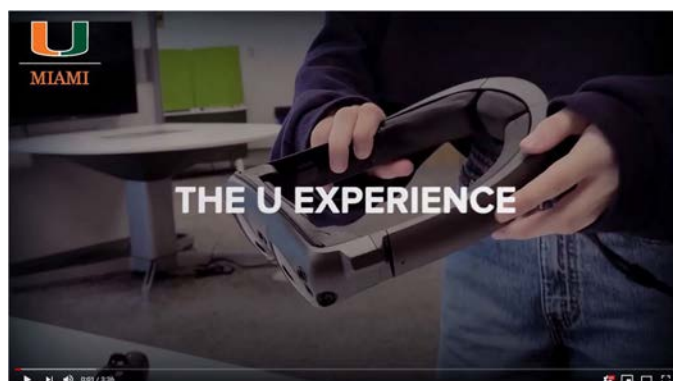
said. “Your artboard is not just a rectangle, it’s a 360° space and it takes some time to start imagining a whole new experience in 3D. But we created a new version of the app that gives the user a feeling of being in a new environment.”



“I will definitely be using supercomputers in my future.”

Manouj plans to become an XR applications developer. “Understanding your target users is vital when developing these experiences,” he said. “I will definitely be using supercomputers in my future.”

Maria believes effective use of data is essential for any field in academics or industry. “We need to keep the research, design, and development of products, services, and applications based on data,” she said. “I’m looking forward to seeing what’s coming next.” ■



Transform The Way
You Learn About The U

youtube.com/watch?v=ssaVILCfWpQ





Maria Aguilar



Manouj Govindaraju



Kim Grinfeder



Barbara Millet

The U Experience

Capstone Project

uexperience.wixsite.com/uexperience

M.F.A. in Interactive Media
Maria Aguilar • Manouj Govindaraju

CONCEPT

By translating the concept of Magicverse, different layers of information on top of a 3D map of the University of Miami Coral Gables campus were developed. Each layer was carefully designed taking into consideration the motivations and concerns of students. The layers complement each other creating an experience that will allow students to learn about the different aspects of the University of Miami, and will help them adjust to college life.

ADVISORS

Kim Grinfeder • Barbara Millet

TOOLS

Unity 2019.2
Maya 2020.1
Blender 2.8
Adobe Illustrator
Adobe Photoshop
Adobe Dimension
Figma
Magic Leap 1 Creator Edition
Leica RTC 360 Laser Scanner
Nikon DSLR Camera
SenseFly Albris Drone





Alberto Cairo and VizUM speaker Jessica Hullman



Getting into the Halloween spirit at GOT



Sensors Working Group uncovers rare bird call



Partnering with Architecture for Smart Cities Conference

IDSC around campus

Reflecting on the past and looking forward to resuming event gatherings. Annual IDSC events include: the Big Data Conference, Smart Cities Miami Conference, Data Intersections Symposium, and VizUM Symposium.



Big Data poster session winner Joseph Gross



Provost Jeffrey Duerk speaks at Triton Launch Celebration



IDSC Industry Advisory Board Chairman Roy Lowrance examines a Big Data Poster Competition entry



Nick at NFL 1st & Future Superbowl Pitch Panel



Frost Science Camp tour with IDSC Advanced Computing stops at the Viz Lab for a demo



Nick and Ben at the Triton Launch Celebration



Software Engineering's Amin Sarafraz helps with Magic Leap demos at The State of the U Address



"The U Experience" orange carpet at The State of the U Address



Chris Mader (center front) with Architecture and Ubetica group at Zenciti Research Unit



Advanced Computing

Rated one of the Top 5 academic institution supercomputers in the country for 2019, TRITON, the U's newest supercomputer, is a state-of-the-art IBM power9 GPU-accelerated system, representing a new approach to computational and data science.

IDSC Advanced Computing consults on storage solutions, hardware, installation, systems administration, storage maintenance, account maintenance, and end-user support.

The AC team can also provide design and implementation of high-performance solutions, scientific programming, parallel code profiling, and code optimization.



305.243.4962 | idsc@miami.edu
idsc.miami.edu/platforms/advanced-computing



UNIVERSITY OF MIAMI
INSTITUTE for DATA SCIENCE
& COMPUTING

