Carnegie Mellon University Qatar

Research Initiatives
2017–18

MILESTONES. ACHIEVEMENTS.
CMU-Q RESEARCH IN REVIEW.

Research Initiatives
2017–18

Table of Contents

Message from the dean

Welcome to *Research Initiatives, 2017-18*, Carnegie Mellon University in Qatar's compendium of research highlights from the last academic year.

At Carnegie Mellon, we often describe our research as "work that matters." As an institution, our mission is to investigate questions that will have a real impact on the world. Each of our faculty and student researchers can answer the question, "why does your research matter?" and at CMU-Q, they can also address the question, "why does your research matter to Qatar?"

For faculty members, research is a way to explore questions and deepen understanding within their areas of expertise. Our faculty researchers are dedicated to scientific inquiry, exploration and discovery, and their body of work demonstrates creativity, hard work and a commitment to finding real answers to questions we face in Qatar and around the world.

At CMU-Q, there is another reason why research matters: research enhances the learning environment, stimulating thought and curiosity. On our campus, undergraduate students have the opportunity to learn about the scientific process in a direct, hands-on way.

For students, participating in research nurtures the skills of creativity and critical thinking. Some students are inspired to continue their studies and pursue careers in research. For others, the intellectual rigor of research is invaluable experience in problem solving, and they can apply these skills in their professional careers, regardless of the industry.

Research Initiatives 2017-18 is a synopsis of the research at CMU-Q over the academic year. I encourage you to read through and learn more about the thought and inquiry taking place at Carnegie Mellon University in Qatar.

Michael Trick
**Dean**
Carnegie Mellon University in Qatar

Research at CMU-Q

A research institute like no other, Carnegie Mellon is home to the world's leading experts in a range of fields. In this tradition, Carnegie Mellon Qatar nurtures and develops opportunities for faculty members and students to build regionally relevant research programs in their areas of expertise.

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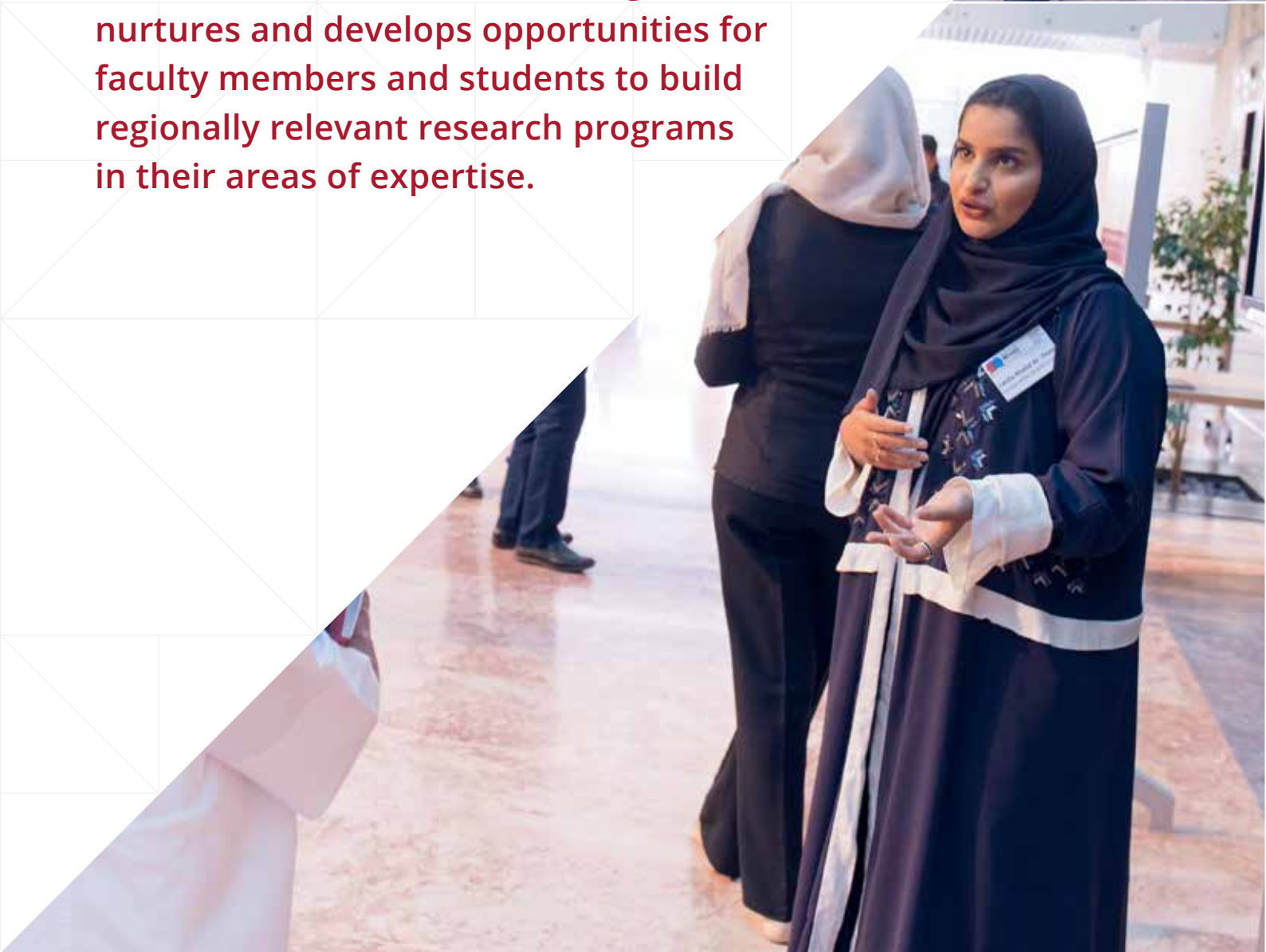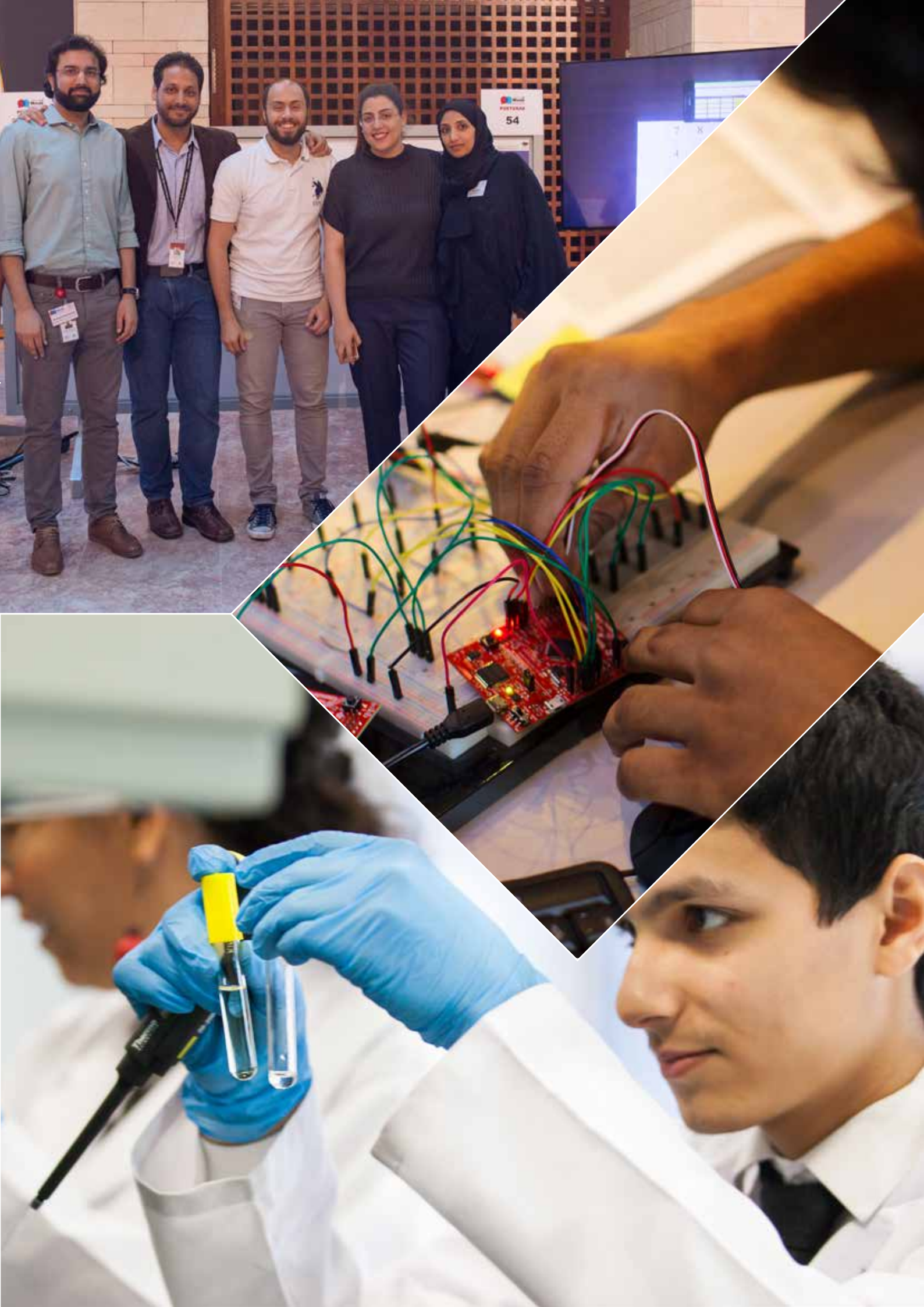
Faculty research

Research in 2017–18

15
ongoing NPRP
research projects

6
new seed grants

12
book chapters

53
journal articles

53
NPRP grants
over 10 cycles

34
conference
presentations

New projects

Language Policy in Globalized Contexts

Dudley Reynolds will be conducting research for a monograph titled *Language Policy in Globalized Contexts*, to be published by the World Innovation Summit for Education (WISE) in conjunction with its 2019 summit. The monograph will present case studies of how a school or system has responded to local needs in order to craft a program of multilingual instruction.

Incoming sub-awards

With Qatar University

QHCN: Towards reliable and efficient mHealth system with multimodal processing and communications for effective remote patient diagnosis
Lead PI: **Amr Mohamed**, Qatar University
PI: **Khaled Harras**, CMU-Q
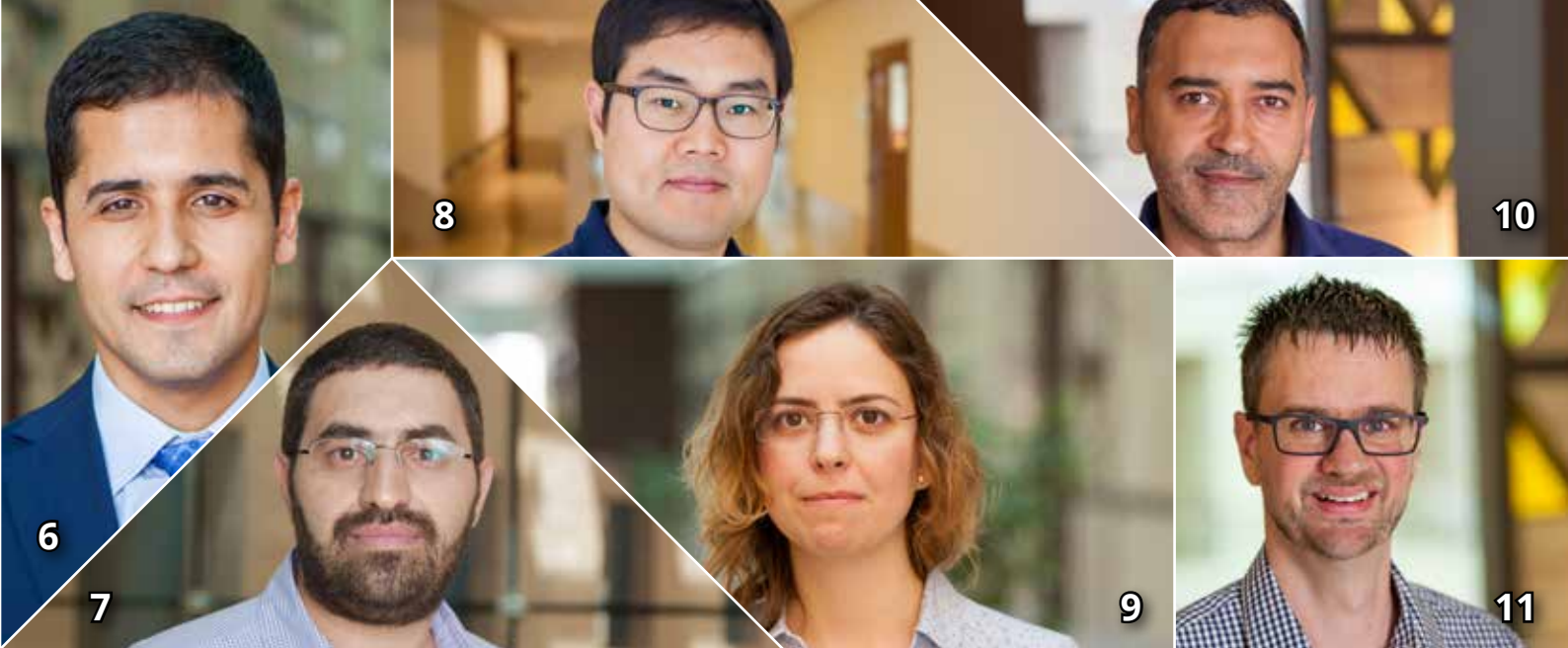
With Hamad Medical Corporation

Personalised drug selection for cancer treatment in Qatar
LPI: **Peter Coveney**, University College London
Co-LPI: **Mohamad Ussama Al Homsi**, Hamad Medical Corporation
PI: **Valentin Ilyin**, CMU-Q

1) **Dudley Reynolds** 2) **Michael Trick** 3) **Khaled Harras** 4) **Valentin Ilyin** 5) **Nesrine Affara** 6) **Serkan Akguc**
7) **Mohammad Hammoud** 8) **Taeyong Park** 9) **Giselle Reis** 10) **Mohamed Zayed** 11) **Ryan Riley**

New seed grants

▲ Delineating the role of cancer-associated fibroblasts in solid tumors
Nesrine Affara

▲ Addressing the sample selection bias issue in finance research using private firms, with a particular focus on the effect of national culture on key corporate decisions
Serkan Akguc

▲ A distributed system for estimating triangle counts in graph streams
Mohammad Hammoud

▲ Longitudinal analysis of media coverage and public attention: data mining and applications
Taeyong Park

▲ Automating the meta-theory of proof systems
Giselle Reis

▲ Structural and electronic properties of quantum magnets
Mohamed Zayed

In the news

Michael Trick was part of an FCC team that was awarded the 2018 Franz Edelman Award for Achievement in Advanced Analytics, Operations Research, and Management Science. The team created a revolutionary approach to meet the demand for the spectrum used for wireless communication in North America. *American Security Today*

A research team has discovered BranchScope, a variant of the Spectre security vulnerability that could allow an attacker to access sensitive data through a side-channel attack method. The team included CMU-Q's **Ryan Riley**. *Security Week*

Mohamed Zayed, working with a large international team of researchers, observed a novel quantum phase transition that lay the groundwork for new technologies that could transcend semiconductor-based circuits in computers. *Nature Middle East*

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Annual Research Conference

The research from CMU-Q played an important role at Qatar Foundation's Annual Research Conference 2018 (ARC'18), contributing to advances and developments in crucial areas to Qatar.

Highlights of CMU-Q at ARC'18

Michael Trick presented an overview of the CMU-Q research activities, highlighting new funded projects that fall within the Energy and Environment Pillar, the Health and Biomedical Pillar, and the Computing and Information Technology Pillar.

Within the Social Sciences, Arts and Humanities Pillar, **Dudley Reynolds** presented his research "How English teachers think about professional development."

John O'Brien spoke on a panel about the future of financial technologies.

CMU-Q's project, Alice Middle East, was featured as part of the Qatar National Research Fund booth as a project that has made a significant impact on Qatar.

The QNRF booth included Meddy, an online physician referral service that was developed by two CMU-Q alumni.

Ongoing NPRP projects

The National Priorities Research Program (NPRP) is the main funding program of Qatar National Research Fund (QNRF). CMU-Q faculty members continued work on 13 projects during the academic year.

◢ Role of the PDZ and LIM containing protein Zasp in integrin-mediated cell adhesion
Lead PI: **Mohamed Bouaouina**

◢ Arab author profiling for cyber-security
Lead PI: **Anis Charfi**
PI: **Abdelmajid Ben Hamadou,** Centre de Recherche en Numérique de Sfax (CRNS), Tunisia
PI: **Paolo Ross**, Polytechnic University of Valencia, Spain

◢ New mathematical models for the large stratin swelling response of biological tissues: Applications to edema, inflammation, and pregnancy
Co-Lead PI: **Hasan Demirkoparan**
Lead PI: **Thomas Pence**, Michigan State University

◢ Teams of aquatic/aerial robots for marine environmental monitoring (TARMEM)
Lead PI: **Gianni Di Caro**
PI: **Enrico Simetti**, Interuniversity Center of Integrated Systems for the Marine Environment (ISME), Genova, Italy
PI: **Filippo Arrichiello**, Interuniversity Center of Integrated Systems for the Marine Environment (ISME), Cassino, Italy

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- Scalable analytics engine for big graphs on the cloud
  Lead PI: **Mohammad Hammoud**
  PI: **Tamar Elsayed**, Qatar University
  PI: **Rami Melhem**, University of Pittsburgh

- Towards mobile opportunistic cloud computing: Enabling generic computation offloading to extreme heterogeneous entities
  Lead PI: **Khaled Harras**

- MADAR: Multi-Arabic dialect applications and resources
  Co-Lead PI: **Kemal Oflazer**
  Lead PI: **Nizar Habash**, New York University Abu Dhabi

- Testing English reading comprehension through deep text analysis and question generation
  Lead PI: **Kemal Oflazer**
  PI: **Teruko Mitamura**, Carnegie Mellon University

- SLATE-Q: Scaffolding literacy in academic and tertiary environments: The case of communication in information systems
  Lead PI: **Silvia Pessoa**
  PI: **Susan Hagan**
  PI: **Divakaran Liginlal**
  PI: **Selma Limam Mansar**
  PI: **Thomas Mitchell**
  PI: **Ahmar Mahboob**, University of Sydney
  PI: **Ryan Miller**, Kent State University

- Bringing computer science to secondary schools – Curriculum design and implementation
  Lead PI: **Saquib Razak**

1) Members of the SLATE-Q team
2) *Dean Trick* addresses ARC'18
3) Alice Middle East display at ARC'18
4) *Dudley Reynolds*
5) The Meddy display

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- Automated verification of properties of concurrent, distributed and parallel specifications with applications to computer security
  Co-Lead PI: **Giselle Reis**
  Lead PI: **Iliano Cervesato**, Carnegie Mellon University
  PI: **Carsten Schürmann**, University of Copenhagen

- Using bacteriophages as biomonitoring tools for water quality measurements
  Lead PI: **Annette Vincent**
  PI: **Valentin Ilyin**
  PI: **Basem Shomar**, Qatar Environment and Energy Research Institute (QEERI), HBKU

- Molecular profiling of breast cancer transcriptome and splicing aberrations
  Lead PI: **Ihab Younis**

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Faculty highlights

Workshop on Modernization of Official Statistics in Qatar

Chadi Aoun presented at the workshop hosted by the Qatar Ministry of Development Planning and Statistics. Aoun offered his perspective on using geographic information systems for effective policy development.

Lakeside Labs Research

Gianni Di Caro delivered a keynote address titled "Robot Swarms: The human-in-the-loop" at the Lakeside Labs Research Days 2017, an interdisciplinary workshop held in collaboration with the University of Klagenfurt in Austria.

IEEE International Conference on Cloud Computing

Mohammad Hammoud was appointed chair of the cloud software engineering track of the 2018 IEEE International Conference on Cloud Computing.

Q-SmartLab and FinTech in Qatar

Under the direction of **John O'Brien** and **Fuad Farooqi**, CMU-Q's Security Market Analysis Research and Trading Lab has been exploring financial technology in Qatar. Q-SmartLab developed a private blockchain, which will be deployed for educational purposes in the 2018-19 academic year.

Turkish Natural Language Processing

Kemal Oflazer edited a comprehensive volume titled *Turkish Natural Language Processing*, and either authored or co-authored nine of the 16 chapters. The volume was published by Springer Verlag in 2018.

Honorable mention, Best Article 2017

Silvia Pessoa and **Tom Mitchell**, along with co-author **R.T. Miller**, received honorable mention for the Best Article Award 2017 in *Journal of Second Language Writing* for "Emergent arguments: A functional approach to analyzing student challenges with the argument genre." A second article by Pessoa, Mitchell and Miller was selected for *Best of the Journals in Rhetoric and Composition 2017.*

International workshops

Giselle Reis served as program chair for the Encyclopedia of Proof Systems workshop in Brazil and the 13th International Workshop on Logical Frameworks and Meta-Languages: Theory and Practice in Oxford.

Kemal Oflazer

Study on academic reading preferences

Alicia Salaz, along with co-authors **Diane Mizrachi**, **Serap Kurbanoglu** and **Joumana Boustany,** studied the reading format preferences of more than 10,000 college and university students in 21 countries. The study, which was published in *PLOS One*, shows that the majority of university students prefer to read their academic materials in print.

Information Security Conference

Nui Vatanasakdakul spoke at the fourth Information Security Conference organized by Qatar Central Bank, sharing her views on the challenges and future directions of cyber security in the financial sector.

Qatar Research Leadership Program

Annette Vincent was the CMU-Q representative for the 2017 Qatar Research Leadership Program, part of Qatar National Research Fund.

Alumni spotlight

Umm-Kulthum Umlai became the first person to discover and characterize a phage from a sand sample in Qatar. Her research was recognized at the 2014 Qatar Foundation Annual Research Forum, where she received the award for best student poster in the Energy and Environment category.

> Studying at CMU-Q taught me to work effectively under pressure while balancing my work, family and social life. One of my favorite professors used to say, 'Start early and don't let things snowball!'

Umlai graduated from CMU-Q in 2016 and then completed her master's degree in biomedical research at Imperial College London. She is now pursuing her Ph.D. in genomics and precision medicine at Hamad Bin Khalifa University.

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Student research

Research is an essential element of the undergraduate experience. For some students, undergraduate research will be just the beginning of a career in scientific exploration, experimentation and analysis. For others, the intellectual rigor of research is invaluable experience in problem solving, which is a critical skill for every professional discipline.

Student research at a glance

16
College Honors theses

4
Qatar Student-Initiated Undergraduate Research Program (QSIURP) awards

16
students presented at international research conferences

36
Meeting of the Minds undergraduate posters

International conferences

◢ IGEM 2017 Giant Jamboree Competition, Boston, USA
Yasmin Abdelaal, Albandari Al-Khater, Dina Nayel Al Tarawneh, Najlaa Al Thani, Aisha Fakhroo, Al-Reem Johar, Saad Rasool, Kawthar Alsadat Jafarian, Fatema Abdul Salik

◢ OurCS 2017, Carnegie Mellon University, Pittsburgh, USA
Zeina Darwiche, Katharine Phelps, Shaden Shaar and Fatma Tlili

◢ 23rd International Conference on Cancer Research and Pharmacology, Edinburgh, Scotland
Nourhan El Khattib, Boshra Al Sulaiti

◢ ACM MobiCom, Snowbird, Utah, USA
Aliaa Essameldin

◢ Very Large Databases Conference, Rio de Janeiro, Brazil
Omar Khattab

◢ 32nd AAAI Conference on Artificial Intelligence, New Orleans, USA
Rohit Krishnan Pillai

1) *Meeting of the Minds 2018* 2) ***Fatma Tlili*** *wins Best Project*
3) ***Dr. Barak Yehya*** 4) ***Dean Trick*** *and* ***Munir Tag*** *present the QNRF awards*

Meeting of the Minds 2018

The annual Meeting of the Minds symposium featured more than 50 research posters, including 36 from undergraduate students. The first Meeting of the Minds was held in 1995 at Carnegie Mellon University's Pittsburgh campus, and CMU-Q has held its own annual event since 2007.

The expert judges represented organizations from across Qatar.

Best project

◢ **Fatma Tlili** won the Best Project Award for her research into developing an automated process for detecting cracks and defects in concrete. Tlili used a combination of image processing and deep learning techniques to identify and map potential cracks using images taken by drones.

Best Poster

◢ **Latifa Khalid Al Thani** was recognized with the Best Poster award for her project to recreate virtually how visitors interact with museum artifacts.

> For a full list of Meeting of the Minds award winners, please see Appendix B.

QNRF awards

◢ Qatar National Research Fund provided a panel of judges who selected projects in each of the areas of biological sciences, computer science and information systems.

> It was very difficult to make these selections, because these were all great projects from great students. QNRF is very proud to support these young researchers.
>
> **Munir Tag**, Senior Program Manager, ICT Qatar National Research Fund

Ministry of Development Planning and Statistics awards

◢ The Ministry of Development Planning and Statistics recognized five projects that contributed to Qatar's future.

> These five projects were judged based on how aligned they are with the second National Development Strategy 2018–2022 of Qatar. All of the projects showed very valuable research, and all the students involved should be proud.
>
> **Dr. Barak Yehya,** Expert, Ministry of Development Planning and Statistics

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Internships and summer programs

Carnegie Mellon Summer Research Institute

Five students attended the Summer Research Institute at the Carnegie Mellon main campus. The 10-week program is an immersive research experience that involves recombinant DNA techniques and biochemical methods directed towards the functional analysis of proteins and enzymes.

Qatar Biomedical Research Institute

Six biological sciences students completed the rigorous research-based summer internship program at Qatar Biomedical Research Institute. The students worked on projects in the areas of cancer research, neuroscience research and diabetes research.

National Center for Cancer Care and Research

CMU-Q and the NCCCR, part of Hamad Medical Corporation, collaborated for the purposes of research and education. Four students participated in medical observerships where they shadowed oncologists and carried out biomedical research.

Robotics Institute Summer Scholars program

Three computer science students attended the Robotics Institute Summer Scholars program at Carnegie Mellon's main campus in Pittsburgh. The 11-week summer undergraduate research program immerses a diverse cohort of scholars in cutting-edge robotics projects.

Interdisciplinary research

IGEM competition at MIT

A CMU-Q student team was awarded Bronze Achievement at the International Genetically Engineered Machines competition hosted by the Massachusetts Institute of Technology in Boston. This is the first time CMU-Q has fielded a team at the annual IGEM competition, which included 310 teams from 44 countries.

The team developed an easy, quick way for the oil industry to test if there is biofilm build-up in offshore pipelines. A rapid and reliable test could lead to the oil industry reducing their use of biocides, which would in turn lessen the negative impact on the marine ecosystem.

The interdisciplinary student team included **Yasmin Abdelaal, Albandari Al-Khater, Dina Nayel Al Tarawneh, Najlaa Al Thani, Aisha Fakhroo, Al-Reem Johar, Saad Rasool, Kawthar Alsadat Jafarian** and **Fatema Abdul Salik**. The team received additional coaching by **Cheryl Telmer**, a research biologist at Carnegie Mellon's Pittsburgh campus.

*1) Student **Najlaa Al Thani** completed a QBRI research internship 2) The **IGEM** team 3) Student **Mohammed Zakaria** presents his senior honors thesis*

Senior honors theses

- Using technology to bridge the communication gap between migrant workers and physicians: the example of Qatar, **Ali Abbas**

- Testing the recruitment of pluripotent mRNAs and/or proteins into stress granules using human induced pluripotent stem cells (hiPSCs), **Farah Ayman AbdelHamid AbdelAziz**

- Mitochondrial dysfunction associated with aspartame toxicity in kidney cells, **Maria Ali**

- A novel post-transcriptional mechanism for inhibiting the expression of PTEN in breast cancer, **Boshra Mohammed Al-Sulaiti**

- Mouse-click vs eye-gaze: A study of natural interactions with intangible digital cultural artifacts, **Latifa Khalid Jabor Al Thani**

- Understanding the usage of technology amongst university students, **Manisha Dareddy**

- MAPK14 splicing as a novel biomarker in breast cancer, **Nourhan Mohamed Saad ElKhatib**

- Interactive evaluation and training of classifiers under limited resources, **Sabit Hassan**

- Behavior analysis using multi-sensor data, **Mir Mohammed Daanish Ali Khan**

- A learning approach to vision-based coarse robotics localization in industry, **Aisha Hassan Mohamed**

- A mixed initiative approach to survivable path planning using imprecise information, **Rohith Krishnan Pillai**

- RISE: Real-time information system for emergency detection, **Umair Waheed Qazi**

- Studying phosphorylation of kindlin F1 loop and interactions with protein partners, **Saad Rasool**

- Deep learning and pattern analysis for crack detection, **Fatma Tlili**

- Technology and parents of children with autism, **Layan Yousef**

- Measuring corporate transparency in sustainability reporting: A study of the energy sector, **Mohammed Zakaria**
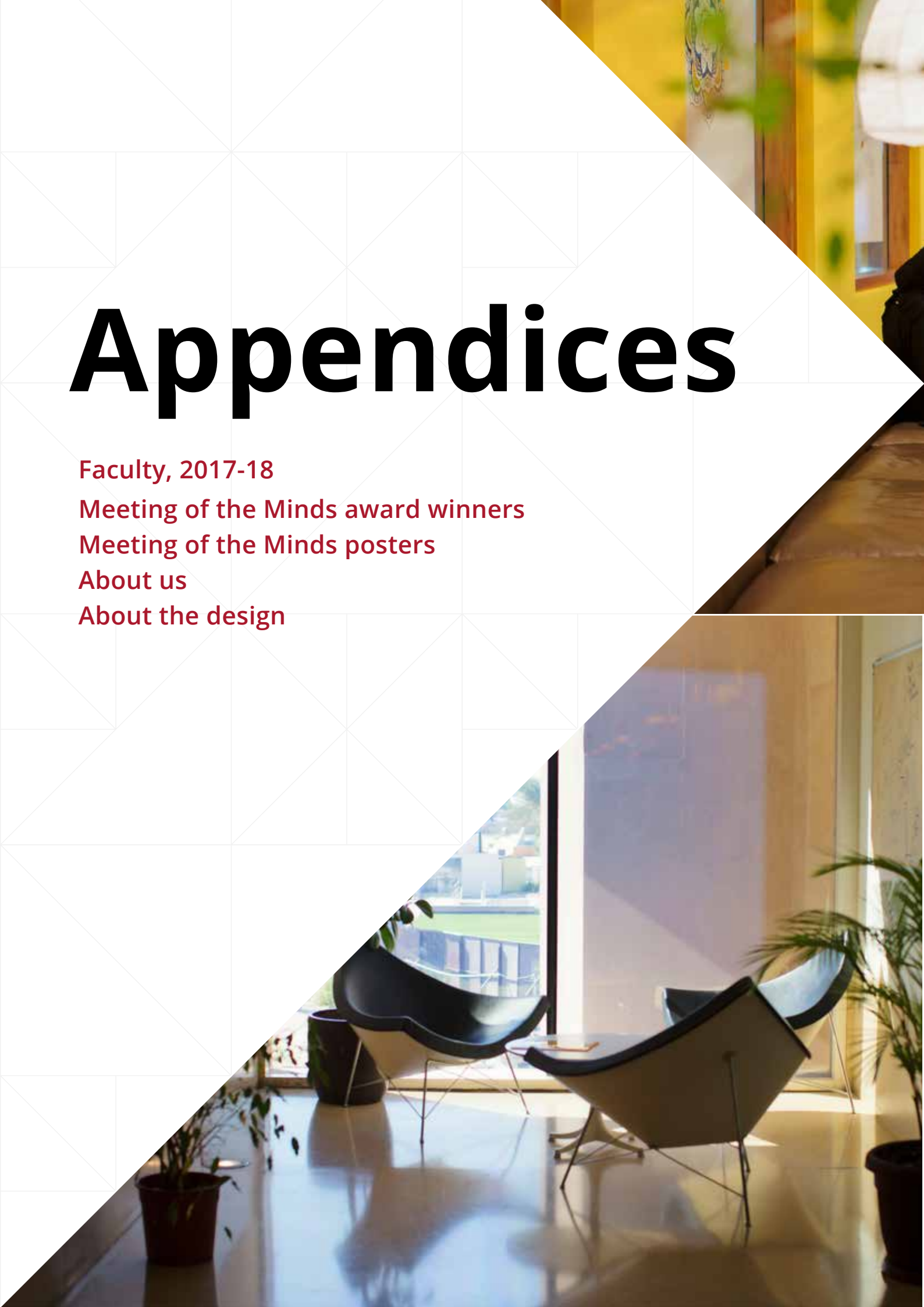
Appendices

Appendix A: Faculty, 2017-18

Nesrine Affara
Assistant Teaching Professor, Biological Sciences

Mustafa Akan
Associate Professor, Operations Management

Serkan Akguc
Assistant Teaching Professor, Finance

Chadi Aoun
Associate Teaching Professor, Information Systems

Ravichandra Bachu
Assistant Teaching Professor, Chemistry

Ilker Baybars
Dean and CEO Emeritus
George Leland Bach Chair
Professor, Operations Management

Peter Boatwright
Allan D. Shocker Professor of Marketing and New Product Development

Serra Boranbay-Akan
Assistant Teaching Professor, Economics

Houda Bouamor
Visiting Assistant Teaching Professor, Computer Science

Mohamed Bouaouina
Assistant Teaching Professor, Biological Sciences

Jennifer Bruder
Visiting Assistant Professor, Organization and Behavior

Stephen Calabrese
Visiting Associate Professor, Economics

Anis Charfi
Associate Teaching Professor, Information Systems

Milton Cofield
Distinguished Service Professor, Business Management

Hasan Demirkoparan
Associate Teaching Professor, Mathematics

Gianni Di Caro
Associate Teaching Professor, Computer Science

Fuad Farooqi
Associate Teaching Professor, Finance

John Gasper
Associate Teaching Professor, Economics

David Emmanuel Gray
Assistant Teaching Professor, Philosophy

Susan Hagan
Associate Teaching Professor, English

Mohammad Hammoud
Assistant Teaching Professor, Computer Science

Khaled Harras
Program Director, Computer Science
Associate Teaching Professor, Computer Science

Erik Helin
Special Lecturer, Spanish

Adam Hodges
Visiting Assistant Professor, English

Ludmila Hyman
Assistant Teaching Professor, English

Zeinab Ibrahim
Teaching Professor, Arabic Studies

Valentin Ilyin
Associate Teaching Professor, Computational Biology

Aaron Jacobson
Visiting Assistant Professor, History

Lansiné Kaba
Thomas M. Kerr Distinguished Career Professor

Christos Kapoutsis
Assistant Teaching Professor, Computer Science

Niraj Khare
Assistant Teaching Professor, Mathematics

Ramesh Krishnamurti
Professor, Architecture

Finn Kydland
Nobel Laureate (2004)
The Richard P. Simmons Distinguished Professorship
University Professor, Economics

Cecile Le Roux
Visiting Assistant Professor, Organization and Behavior

Divakaran Liginlal
Teaching Professor, Information Systems

Selma Limam Mansar
Senior Associate Dean, Education
Area Head, Information Systems
Teaching Professor, Information Systems

Teresa MacGregor
Director, Library

Drew Mallory
Visiting Assistant Professor, Organization
and Behavior

Patrick McGinnis
Program Director, Business Administration
Distinguished Career Professor, Business
Communication

Thomas Mitchell
Associate Teaching Professor, English

John O'Brien
Senior Associate Dean
Area Head, Business Administration
Associate Professor, Accounting and
Experimental Economics

Joyce Oates
Assistant Teaching Professor, Psychology

Kemal Oflazer
Associate Dean, Research
Area Head, Computer Science
Teaching Professor, Computer Science

Marion Oliver
Area Co-Head, Arts and Sciences
Teaching Professor, Mathematics

Taeyong Park
Visiting Assistant Teaching Professor, Statistics

Silvia Pessoa
Associate Teaching Professor, English

Daniel Phelps
Program Director, Information Systems
Associate Teaching Professor,
Information Systems

Saquib Razak
Associate Teaching Professor, Computer
Science

Benjamin Reilly
Associate Teaching Professor, History

Giselle Reis
Assistant Teaching Professor, Computer Science

Dudley Reynolds
Area Co-Head, Arts and Sciences
Teaching Professor, English

Ryan Riley
Associate Teaching Professor,
Computer Science

Gordon Rule
Area Head, Biological Sciences
Professor, Biological Sciences

Alicia Salaz
Senior Librarian and Information Scientist

Francesco Sguera
Visiting Assistant Teaching Professor,
Organizational Behavior

Peter Stüttgen
Visiting Associate Teaching Professor, Marketing

Michael Trick
Dean
Harry B. and James H. Higgins Professor of
Operations Research

Stephen Vargo
Visiting Assistant Professor,
Business Administration

Nui Vatanasakdakul
Visiting Associate Professor,
Information Systems

Annette Vincent
Program Director, Biological Sciences
Associate Teaching Professor, Biological
Sciences

George White
Distinguished Career Professor,
Entrepreneurship

Zelealem Yilma
Assistant Teaching Professor, Mathematics

Ihab Younis
Assistant Teaching Professor, Biological
Sciences

Mohamed Zayed
Associate Teaching Professor, Physics

Appendix B: Meeting of the Minds 2018 award winners

Best Project

1. Fatma Tlili, "Deep learning and pattern analysis for crack detection."
Advisor: **Gianni Di Caro**

2. Mohammad Osaama Bin Shehzad, "Classification of bacterial diversity in Qatar ballast water samples using QIIME bioinformatics pipeline."
Advisors: **Annette Vincent**, **Basem Shomar**, Qatar Environment and Energy Research Institute

3. Muhammad Ali Bashir, Umair Qazi, "RAES: Road accidents and emergency services in the United States."
Advisor: **Chadi Aoun**

Best Poster

Latifa Khalid Al Thani, "Communicate through your eyes: A study of natural interactions with a digital cultural artifact."
Advisor: **Divakaran Liginlal**

QNRF Awards

Biological Sciences: **Boshra Al-Sulaiti, Reem Elasad and Ettaib El Marabti,** "A novel post-transcriptional mechanism for inhibiting the expression of PTEN in breast cancer."
Advisor: **Ihab Younis**

Computer Science: **Rohith Krishnan Pillai,** "Mixed initiative system for survivable path planning in cluttered environments."
Advisor: **Gianni Di Caro**

Information Systems: **Ali Abbas,** "Doctor-patient communication in Qatar."
Advisor: **Selma Limam Mansar**

Ministry of Development Planning and Statistics Awards

Boshra Al-Sulaiti, Reem Elasad and Ettaib El Marabti, "A novel post-transcriptional mechanism for inhibiting the expression of PTEN in breast cancer."
Advisor: **Ihab Younis**

AlReem Johar, "Life bacterial detection using RNA extraction from ballast water sample."
Advisor: **Annette Vincent**

Aya Nour and **Fatema Abdul Salik,** "Testing for the presence of genetic modifications in common corn products — tortilla chips and corn flour."
Advisor: **Annette Vincent**

Mohammed Zakaria, "Measuring corporate transparency in sustainability reporting: A study of the energy sector."
Advisors: **Divakaran Liginlal, Chadi Aoun**

Postgraduate: **Ossama Obeid, Salam Khalifa, Nizar Habash, Houda Bouamor, Wajdi Zaghouani, Kemal Oflazer,** "MADARi: A web interface for joint Arabic morphological annotation and spelling correction."

Appendix C: Meeting of the Minds posters

Biological Sciences

Effects of different stresses on pluripotent stem cell fate

Are you sure your soy is non-GMO?

Phenotypic and behavioral characterization of MDA-MB 231/468 breast cancer cell lines

Detection of CP4-EPSPS and other GM genes in soy milk variants

A novel post-transcriptional mechanism for inhibiting the expression of PTEN in breast cancer

Mitochondrial dysfunction associated with aspartame toxicity in kidney cells

Is corn syrup used in processed products extracted from genetically modified corn?

Classification of bacterial diversity in Qatar ballast water samples using QIIME bioinformatics pipeline

Identification of post transcriptional regulatory factors of PTEN expression in breast cancer cells

Investigating the presence of 35s promoter, CRY1A(b), Bat and Pat genes as markers for genetic modification in three commercial *Zea Mays* (Corn) food products

MAPK14 splicing as a novel biomarker in regulating breast cancer

Analysis of genetically modified (GM) marker genes in maize-based products using multiplex PCR and ELISA

Life bacterial detection using RNA extraction from ballast water sample

Truncations of Drs1 arms provide insight into their possible functions

Testing for the presence of genetic modifications in common corn products – tortilla chips and corn flour

Studying phosphorylation of Kindlin F1 loop and interactions with protein partners

Investigating oxidative stress induced by aspartame in human embryonic kidney cells

The varying amount of genetic modifications in non-GMO labelled products from the USA and Europe

Computer Science

An oracle characterization of the polynomial-size alternating hierarchy

Interactive evaluation and training of classifiers

Minimizing cost of accuracy estimation of automated classifiers

Behaviour analysis using multi-sensor data

A learning approach to vision-based coarse robotics localization in industry

Computational analysis of the role of MTCP1 in T-cell leukaemia

Mixed initiative system for survivable path planning in cluttered environments

Relating children's automatically detected facial expressions to their behavior in RoboTutor

Deep learning and pattern analysis for crack detection

Information Systems

Doctor-patient communication in Qatar

Trust in commerce through Instagram in Qatar

Communicate through your eyes: A study of natural interactions with a digital cultural artifact

Parents of children of autism and technology use by the children

RAES: Road accidents and emergency services in the United States

A study on the use of educational tools amongst university students

RISE: Real-time information system for emergency detection

NEOS: Saving receipts electronically

Measuring corporate transparency in sustainability reporting: A study of the energy sector

Postgraduate posters

Delay tolerant computing

The MADAR Arabic dialect corpus and lexicon

Guidelines and annotation framework for Arabic author profiling

Teams of aquatic and aerial robots for marine environmental monitoring

Offloading mobile storage to underutilized edge devices

Extending the range via ad-hoc communication for cooperative robotic watercraft

RAMOS: A resource-aware multi-objective system for edge computing

MADARi: A web interface for joint Arabic morphological annotation and spelling correction

Event coreference using neural network classifiers

Fine-grained Arabic dialect identification

Formalization of financial trading systems in a concurrent logical framework (CLF)

About us

For more than a century, Carnegie Mellon University has challenged the curious and passionate to imagine and deliver work that matters. A private, top-ranked and global university, Carnegie Mellon sets its own course with programs that inspire creativity and collaboration.

In 2004, Carnegie Mellon and Qatar Foundation began a partnership to deliver select programs that will contribute to the long-term development of Qatar. Today, Carnegie Mellon Qatar offers undergraduate programs in biological sciences, business administration, computational biology, computer science, and information systems. Nearly 400 students from 38 countries call Carnegie Mellon Qatar home.

Graduates from CMU-Q are making a deep impact in Qatar and around the world. Most choose careers in top organizations, and many have completed graduate studies. A growing number are pursuing entrepreneurial projects. With 11 graduating classes, the total number of alumni is nearly 800.

To learn more, visit www.qatar.cmu.edu and follow us on:

- ◢ **Twitter:** @CarnegieMellonQ
- ◢ **Instagram:** @carnegiemellonq
- ◢ **Facebook:** CarnegieMellonQ
- ◢ **YouTube:** CarnegieMellonQatar
- ◢ **LinkedIn:** Carnegie Mellon Qatar

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About the design

The wall of the main walkway of the Carnegie Mellon University in Qatar building is an intricate pattern in colored Egyptian glass, sandstone and steel. Created by artist **Pilar Climent**, the wall is the largest piece of art that architects Legorreta + Legorreta have ever integrated into a building.

For the CMU-Q community, this art piece forms the backdrop for the challenges, celebrations, connections and achievements of university life. We have incorporated the triangle motif into *Research Initiatives 2017–18* to symbolize the shared experience of this academic year.
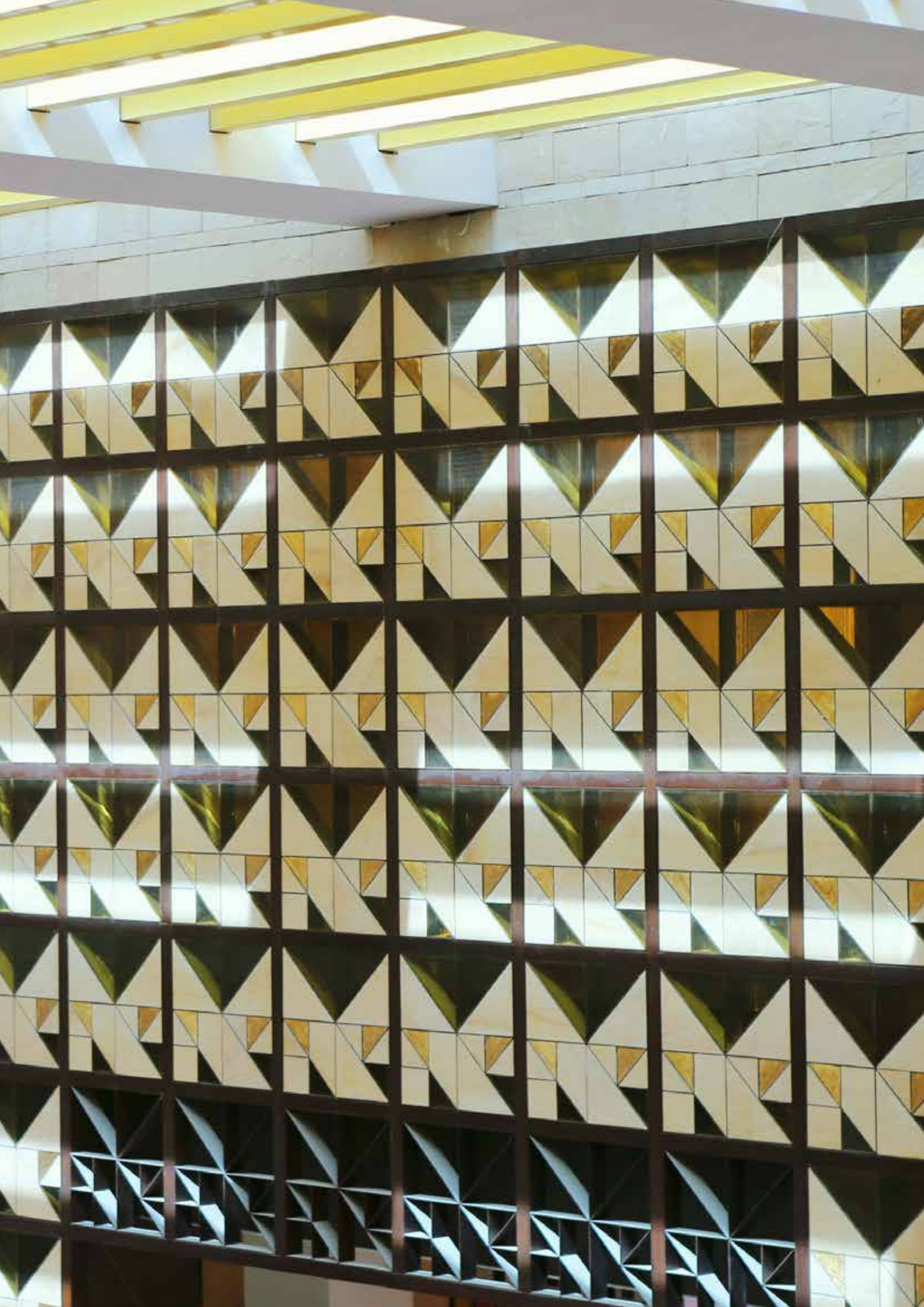
My heart is
~
in the work

Andrew Carnegie

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