

Carnegie  
Mellon  
University



**This is  
for the  
founders.**

Celebrating 50 years as Carnegie Mellon University



For the fierce industrialists and staunch philanthropists who pioneered advancements in Pittsburgh and created a legacy of promise that touches every corner of the globe.

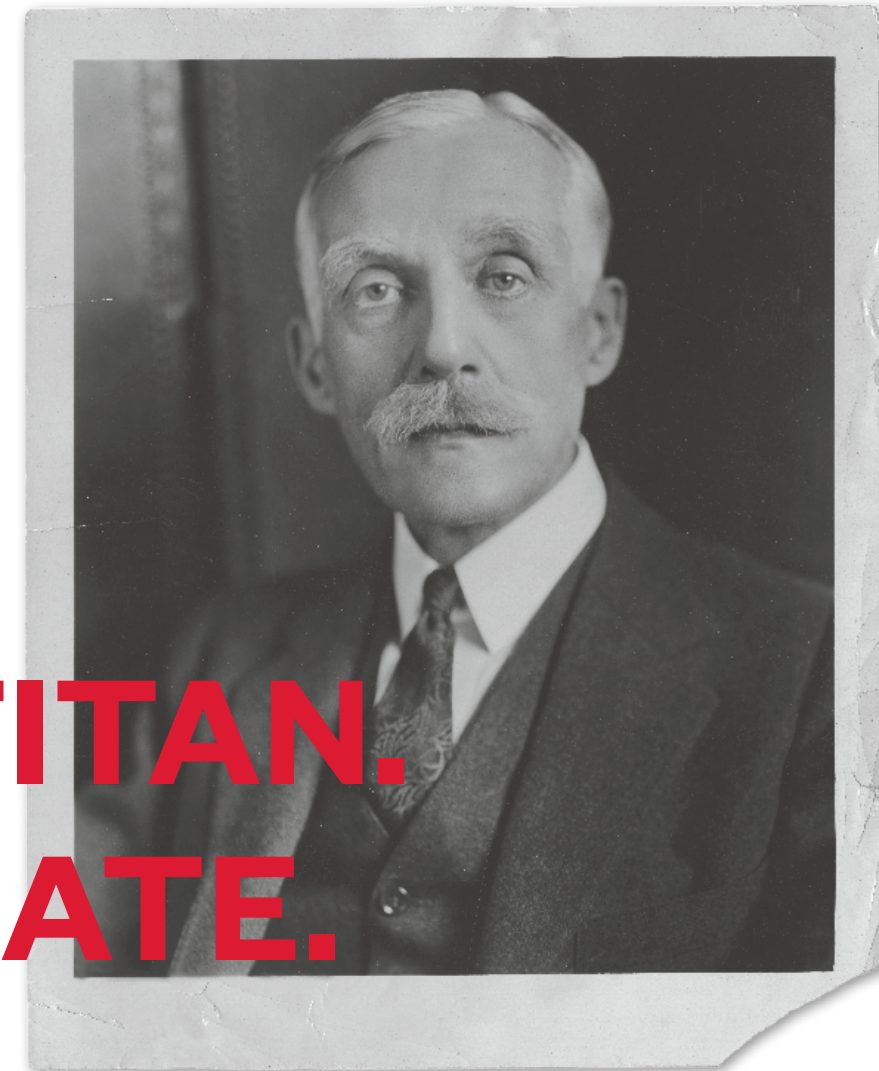
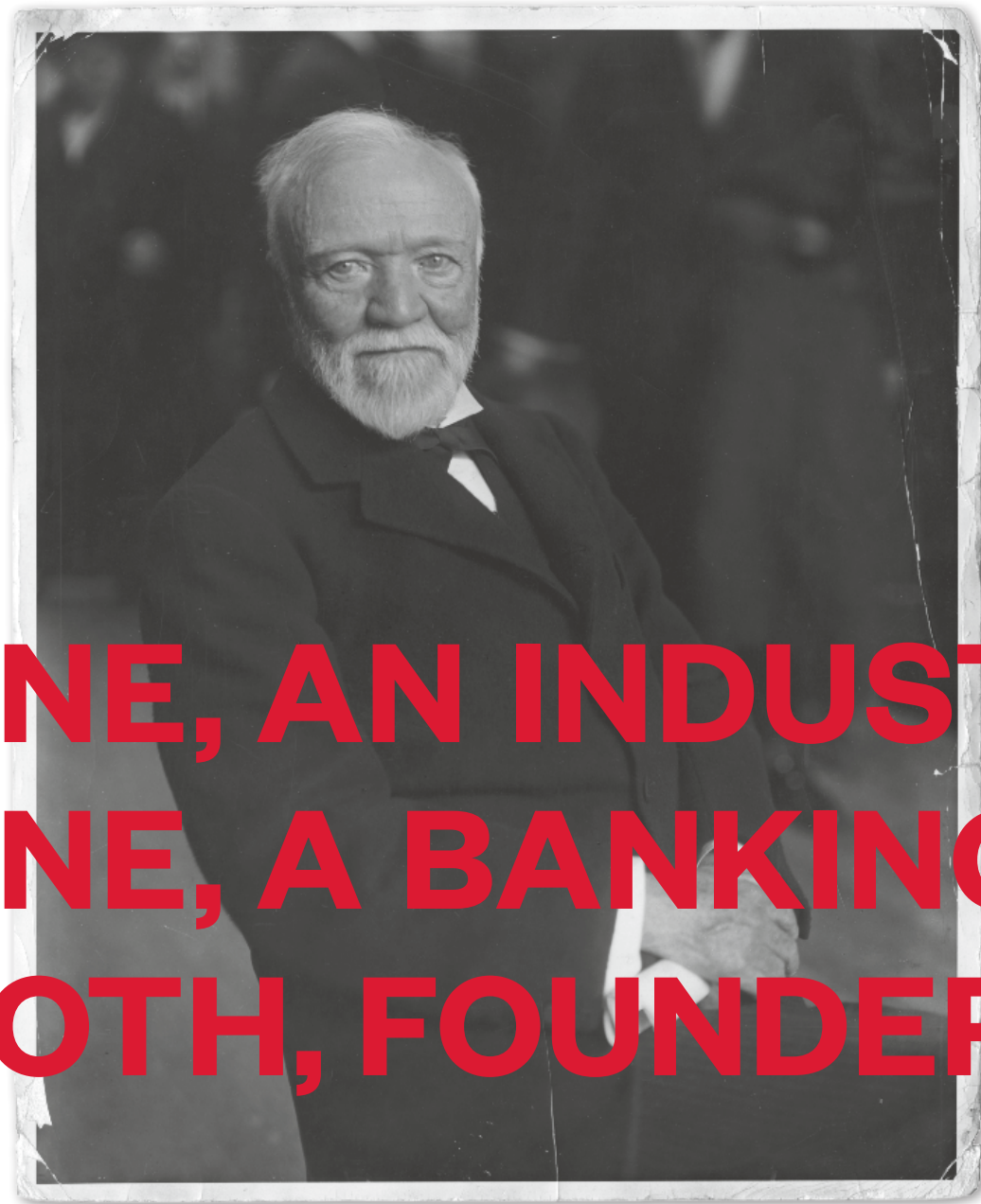
For the bold visionaries who stand ready to face new challenges with raw talent, deep focus, sharp intelligence and the sheer force of will.

For the forward-thinking leaders who keep their hearts in the work and their eyes on the future, holding firm to the belief that their breakthroughs will change it for the better.

For those audacious enough to dare to question what is, courageous enough to imagine what could be, and tenacious enough to make it happen.

This is for the idealists and the investigators, the thinkers and creators, the dreamers and doers who have made Carnegie Mellon University what it is today, and who will shape the world we'll all inhabit tomorrow.

**This is for the founder  
in all of us.**



**ONE, AN INDUSTRIAL TITAN.  
ONE, A BANKING MAGNATE.  
BOTH, FOUNDERS.**

**Andrew Carnegie**, a self-made industrialist, entrepreneur and philanthropist, believed profoundly in the value of learning in transforming human lives and communities. He founded Carnegie Technical Schools to bring educational opportunity to the children of working-class Pittsburgh residents.

**Andrew Mellon** was a Pittsburgh banker, venture investor and U.S. Secretary of the Treasury who, with his brother **Richard**, financed the Mellon Institute of Industrial Research based on his conviction that advances in knowledge were the true foundation of future prosperity.

These founders of institutions of higher learning fostered inventive thinking and advanced humanity—and 50 years ago, their legacies converged when Andrew's son, **Paul Mellon**, proposed a merger to form what we now know as Carnegie Mellon University, setting the stage for the greatest minds in the world to become founders here, too.





The Pausch Bridge on our campus is a constant reminder of Pausch's legacy, lighting the way for generations of risk-takers to come.



Someone has to be  
the first penguin.

*risk-takers*

Brave enough to make the first dive into treacherous waters, taking that initial risk so that others can follow. It's a theory that was embraced and shared by CMU alumnus and Professor **Randy Pausch**, who took his own risks in many ways: developing Alice, a free educational computer programming tool; creating his "The Last Lecture" talk, video and bestselling book that have inspired millions; and co-founding CMU's groundbreaking Entertainment Technology Center.





Each year, more than  
21 million Americans are  
diagnosed with an eye disease.

But there could be a solution. With a grant from the U.S. Department of Veterans Affairs, **Shawn Kelly**, senior systems scientist at CMU, has developed a retinal prosthesis that could restore functional vision to the blind. This microchip and thin-film electrode array could assist people living with diseases such as macular degeneration, as well as veterans who have suffered head and eye wounds.

Parlez-vous  
français?

You might if you used Duolingo. Outside of school, learning a new language can be time-consuming and expensive. That's why CMU alumnus and Professor **Luis von Ahn** and alumnus **Severin Hacker** developed their app, which is now the world's most popular language-learning program, with 200 million users.

Fundador

Oprichter

创始人

Fondateur

Tagapagtatag

Gründer

元祖

Founder

Fondatore

설립자

Założyciel

Conditor

संस्थापक



Not quite a person.

Plenty of personality.

A unique mix of art and technology, Valerie was one of the world's first "roboceptionists." A collaboration between CMU Robotics Institute Research Professor **Reid Simmons** and School of Drama Professor **Anne Mundell**, she greeted visitors to Newell-Simon Hall with a lot of attitude and tons of stories to tell. Valerie came to life using technology that already existed, but was deployed in a different way. Using sensors to alert her to people passing by, Valerie could hold a conversation with users who typed their responses to her. A cutting-edge development at her inception in 2003, Valerie and her technology were later replaced by the still-active Tank — but she remains influential in artificial intelligence and social robots today.



# THE WORLD'S MOST PRESTIGIOUS PRIZE.



© The Nobel Foundation

Won by  
these founders.

## Lars Peter Hansen

Tepper School Former Faculty  
Economic Sciences, 2013

## Dale T. Mortensen

Tepper School, 1967  
Economic Sciences, 2010

## Oliver E. Williamson

Tepper School, 1962, 1963  
Economic Sciences, 2009

## Ada E. Yonath

Mellon College of Science  
Postdoctoral Fellow, 1969  
Chemistry, 2009

## Edward S. Rubin

College of Engineering Faculty  
Peace, 2007

## John L. Hall

Mellon College of Science,  
1956, 1958, 1962  
Physics, 2005

## Finn E. Kydland

Tepper School Faculty;  
Tepper School, 1972, 1973  
Economic Sciences, 2004

## Edward C. Prescott

Tepper School Former Faculty;  
Tepper School, 1967  
Economic Sciences, 2004

## Paul C. Lauterbur

Mellon Institute Former  
Researcher  
Physiology or Medicine, 2003

## Walter Kohn

## John A. Pople

Mellon College of Science  
Former Faculty  
Chemistry, 1998

## Robert E. Lucas Jr.

Tepper School Former Faculty  
Economic Sciences, 1995

## Clifford G. Shull

Mellon College of Science, 1937  
Physics, 1994

## John F. Nash Jr.

Mellon College of Science, 1948  
Economic Sciences, 1994

## Merton H. Miller

Tepper School Former Faculty  
Economic Sciences, 1990

## Franco Modigliani

Tepper School Former Faculty  
Economic Sciences, 1985

## Herbert A. Simon

Dietrich College/School of  
Computer Science/Tepper  
School Former Faculty  
Economic Sciences, 1978

## Paul J. Flory

Mellon Institute Former  
Researcher  
Chemistry, 1974

## Otto Stern

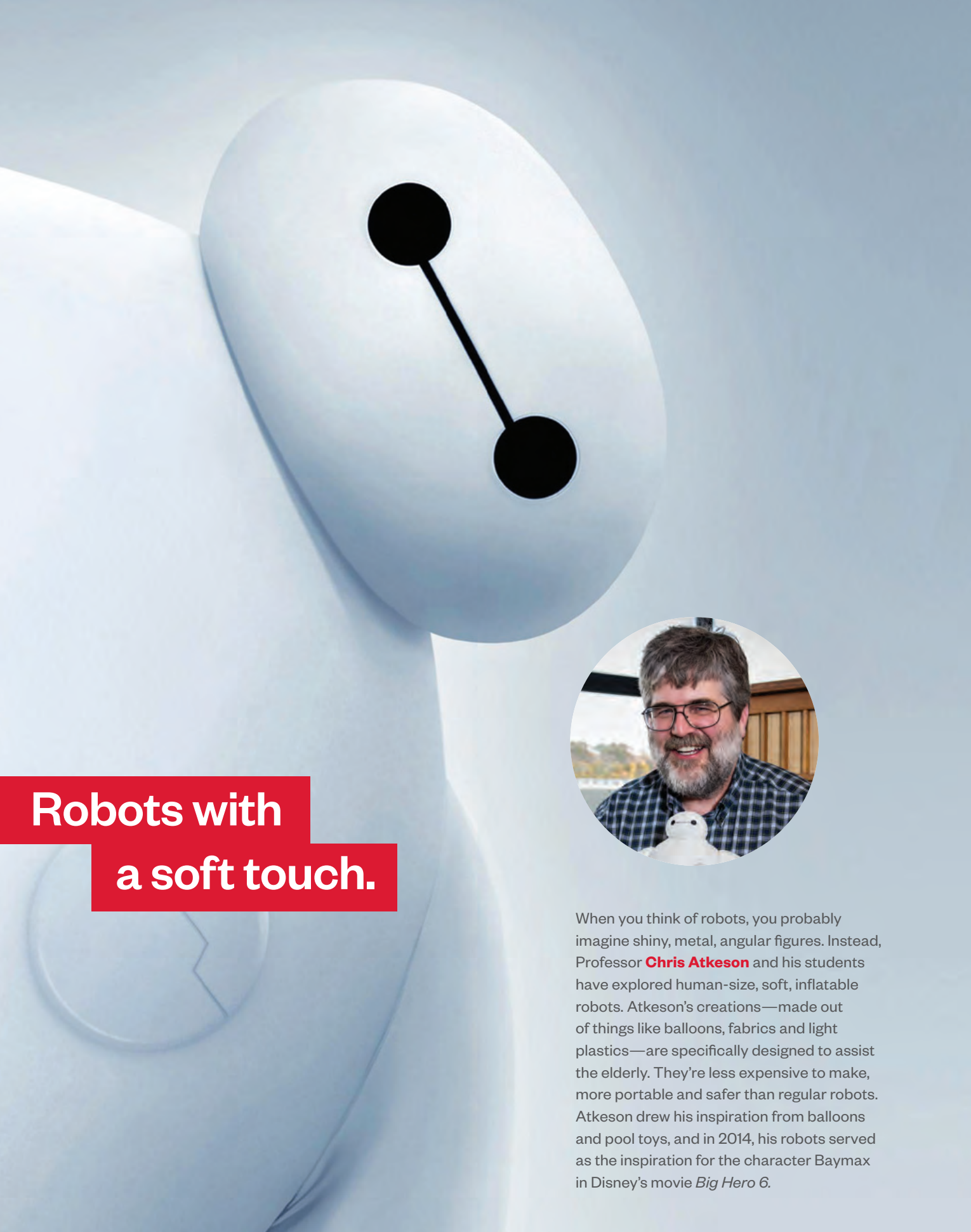
Mellon College of Science  
Former Faculty  
Physics, 1943

## Clinton J. Davisson

Mellon College of Science  
Former Faculty  
Physics, 1937

AND FOR THE INTELLECTUALS

WHO BRILLIANTLY PUSH THE ENVELOPE AND PROPEL US TO A HIGHER PLANE OF THINKING



**Robots with  
a soft touch.**



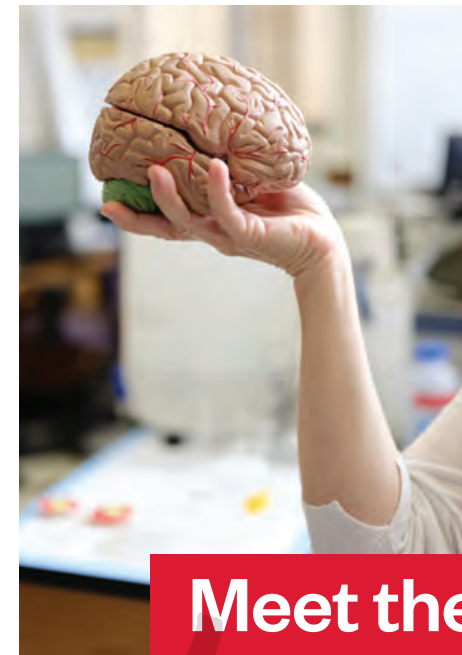
When you think of robots, you probably imagine shiny, metal, angular figures. Instead, Professor **Chris Atkeson** and his students have explored human-size, soft, inflatable robots. Atkeson's creations—made out of things like balloons, fabrics and light plastics—are specifically designed to assist the elderly. They're less expensive to make, more portable and safer than regular robots. Atkeson drew his inspiration from balloons and pool toys, and in 2014, his robots served as the inspiration for the character Baymax in Disney's movie *Big Hero 6*.



For injection drug users, one of the most profound ways to prevent diseases is to use clean needles. CMU Associate Professor Emeritus **Caroline Acker** knew that no needle exchanges existed in the region, and that's why in 1995 she co-founded her own. Prevention Point Pittsburgh is still going strong more than 20 years later, as it continues its work of preventing the spread of HIV/AIDS and hepatitis C, conducting overdose prevention and response education, and connecting program participants to services such as substance abuse treatment. It was one of the first programs in the country to distribute naloxone, the drug that reverses opioid overdoses, to people at risk for overdose and their associates.

**Safer streets  
with clean needles.**





**Meet the brain  
behind the brain.**

*innovators*

Professor **Alison Barth** devotes her work to studying how the brain rewires itself after every experience. By examining neurons at the macro level, Barth and her lab's researchers are deepening the world's understanding of human memory, which will allow others to treat brain injuries more effectively and help people learn faster, more efficiently and with less effort.

```
package client;

import common.Printer;

import java.rmi.RMISecurityManager;

import net.jini.discovery.LookupDiscovery;
import net.jini.discovery.DiscoveryListener;
import net.jini.discovery.DiscoveryEvent;
import net.jini.core.lookup.ServiceRegistrar;
import net.jini.core.lookup.ServiceTemplate;
```

```
public class TestPrinterSpeed implements DiscoveryListener {
```

A one-code-fits-all language.

Created by a founder.

```
    RMISecurityManager();
```

```
    private LookupDiscovery discover = null;
```

```
    private void discover() {
        discover = new LookupDiscovery(LookupDiscovery.ALL_GROUPS);
```

```
        discover.addDiscoveryListener(this);
        discover.start();
    }
```

```
}
```

```
public void discovered(DiscoveryEvent evt) {
```

```
    ServiceRegistrar[] registrars = evt.getRegistrars();
    Class[] classes = new Class[] {Printer.class};
```

```
    ServiceTemplate template = new ServiceTemplate(null, classes,
                                                    null);
```

```
    for (int n = 0; n < registrars.length; n++) {
        ServiceRegistrar registrar = registrars[n];
        ServiceMatches matches;
```

```
        try {
            matches = registrar.lookup(template, 1);
        } catch (java.rmi.RemoteException e) {
            e.printStackTrace();
            continue;
        }
```

```
        int speed = printer.getSpeed();
        if (speed >= 24) {
```

```
            printer.print("fast enough printer");
        } else {
```

```
            System.out.println("Printer too slow at " + speed);
        }
```

```
    }
```

```
}
```

```
public void discarded(DiscoveryEvent evt) {
```

```
}
```

```
public static void main(String[] args) {
```

```
    TestPrinterSpeed f = new TestPrinterSpeed();
```

```
    try {
        Thread.currentThread().sleep(10000L);
    } catch (java.lang.InterruptedExcepion e) {
```

```
    }
```

```
}
```

When it comes to coding, one Java is all you need. In 1995, CMU alumnus **James Gosling** created the trailblazing tech language that allowed developers to “write once, code anywhere.” With the ability to run the same program on many systems, Java eliminated the need to use different platforms for different machines — and now, it’s the language of choice for more than 10 million developers worldwide.

The software

used to design this very book.

Developed by a founder.



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Adobe, co-founded in 1982 by CMU alumnus **Charles Geschke**, was the first company in the history of Silicon Valley to become profitable in its first year. Even if you’re not a frequent user of its famous suite of design software, you see hundreds of photos, logos, publications and advertisements touched by its products every day.





He made the  
kidney exchange  
more efficient.

CMU Professor **Tuomas Sandholm** saw a need to increase the efficiency of kidney exchanges. That's why he developed the leading algorithms that find swapping cycles and chains among willing but incompatible donor-patient pairs. Since 2010, his work has powered the UNOS kidney exchange, where the algorithms optimize the exchange possibilities twice a week for 69 percent of all transplant centers in the United States.



He made more  
transplants possible.

In 2010, CMU Professor **Sridhar Tayur** conceived OrganJet, a company that provides free advice to patients about transplant list options and access to affordable air transport for those who are multi-listed for organ transplants in the U.S. With the additional goal of increasing the organ supply, Tayur also developed an inspiring nudge video in 2016 that improved organ donation rates and was highlighted by the White House.

By combining his expertise in supply chain management with his passion for health care innovation, Tayur's work is decreasing transplant wait times, increasing the number of transplantations and reducing organ discards — and thus improving quality of life and increasing the number of lives saved.

LET'S JUST STOP  
FOR A SECOND  
TO APPRECIATE  
THE FACT THAT

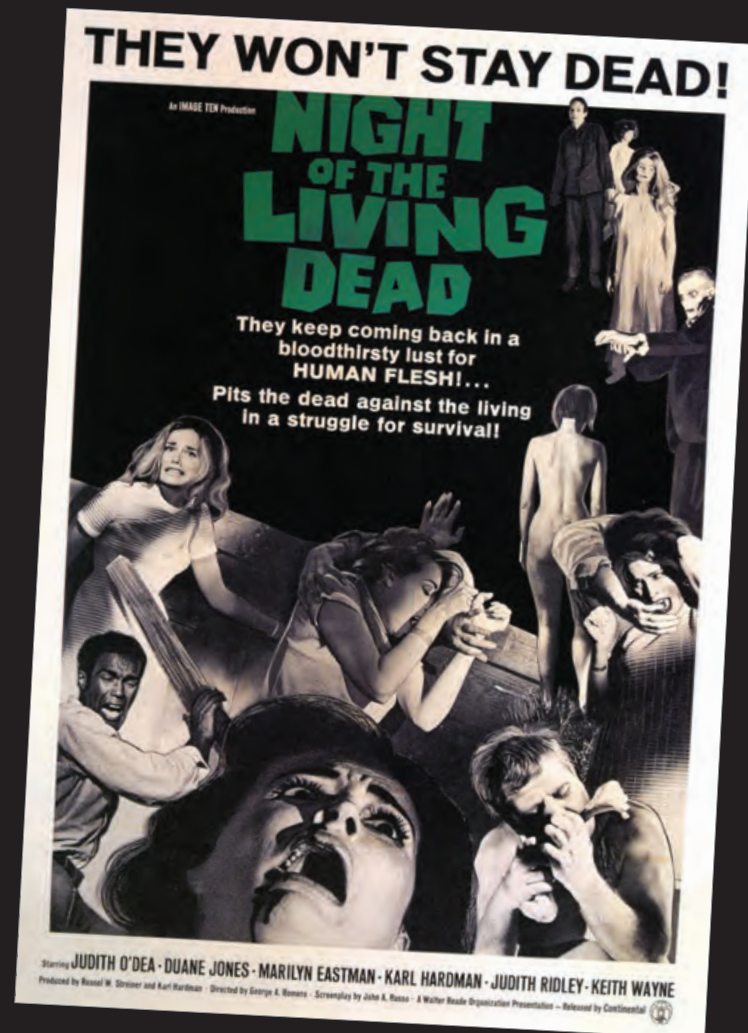
# WI-FI WAS ESSENTENTIALLY INVENTED HERE.

Streaming TED Talks in your favorite cafe: brought to you by CMU  
Professor **Alex Hills**, who in 1993 founded the Wireless Andrew initiative—  
a campus-wide network that allowed computers to wirelessly  
connect to the internet.



In 1968, they rose  
from the dead.

Before that, they lived in the mind of CMU alumnus **George Romero**, who developed the movie that led to a nationwide obsession with zombies that continues to this day.



In 1990, he brought  
computer animation to life.



In 1990, **James Duesing**, director of CMU's Center for the Arts in Society, created one of the earliest examples of animation using a desktop computer. His work has spanned hand-drawn, 3-D and motion-capture projects. Duesing's animation frequently offers comical and eccentric reflections on human interactions and desires in realms poisoned by environmental disaster or cut off from nature.

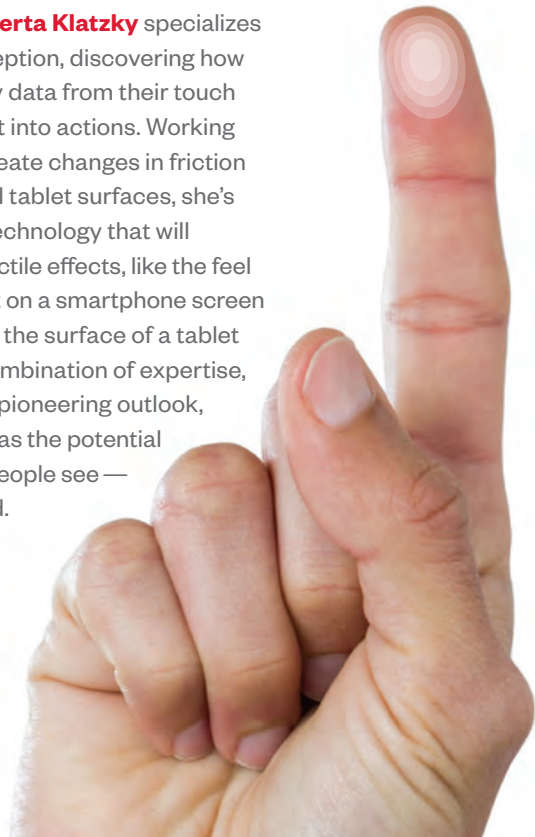
His work has been exhibited and broadcast all over the world in places like the Sundance Film Festival and the Museum of Modern Art, and he has received numerous awards and grants, including a regional Emmy Award from the National Academy of Television Arts and Sciences and an American Film Institute Independent Filmmaker Fellowship.



# Inventors

Putting more touch  
in touchscreen.

CMU Professor **Roberta Klatzky** specializes in the study of perception, discovering how people take sensory data from their touch receptors and turn it into actions. Working with engineers to create changes in friction on glass phones and tablet surfaces, she's developing haptic technology that will produce different tactile effects, like the feel of a swatch of velvet on a smartphone screen or a raised graph on the surface of a tablet computer. With a combination of expertise, collaboration and a pioneering outlook, Klatzky's research has the potential to change the way people see — and feel — the world.







Infinite options.

One clear answer.

In order to make fuller use of the human, social and technological capabilities of professionals like managers, engineers and doctors, University Professor **Denise Rousseau** developed evidence-based management. This science-informed practice, based on a large body of social science and management research, is designed to help people make better-informed decisions that work. In the real world, small-business owners can decide which organizational structure allows them to grow the most, tech CEOs can decide which product has the most potential market value, and doctors can make better diagnoses and provide better treatment options to patients.



30 teams.

162 games each.

One schedule.

Before **Michael Trick**, dean at Carnegie Mellon Qatar, optimized the scheduling process of Major League Baseball, the entire schedule was made mostly by hand. Using his background in computational methods in optimization, Trick and his team were able to schedule an entire season at the speed of a fastball. MLB selected Trick's schedule back in 2004, and still uses his scheduling algorithms today.





And these founders  
invent them.

Carnegie Mellon's **Engineering and Public Policy** program was a pioneer when it was created more than four decades ago, spurred by faculty from what are now the College of Engineering and Heinz College. Later joined by professors from the School of Computer Science, Mellon College of Science, Tepper School of Business, and Dietrich College of Humanities and Social Sciences, they recognized a need to rigorously examine — and prepare students to address — the profound societal repercussions of technology.

The department's faculty, students and alumni dedicate their work to studying technical and scientific issues that intersect with and inform public policy. They have played a central role in understanding and providing solutions for geopolitical concerns such as climate change, the health and environmental effects of our energy systems, and information and communication.

This founder  
cultivates fields.

By the year 2040, there will be more people on the planet than there is food to feed them. That's why CMU scientist **George Kantor** is leading FarmView, a comprehensive initiative employing sensors, robotics and artificial intelligence. These technologies will improve plant-breeding and crop-management practices, and help identify and exploit high-yield, high-protein crops that succeed with minimal care in varying climates.



# BROADWAY'S BIGGEST DISTINCTION.

Bestowed on these founders.

## René Auberjonois

**College of Fine Arts, 1962**  
Best Actor, Supporting or Featured (Musical), *Coco* (1970)

## Christian Borle

**College of Fine Arts, 1995**  
Best Actor, Featured Role (Play), *Peter and the Starcatcher* (2012); Best Actor, Featured Role (Musical), *Something Rotten!* (2015)

## Jamie deRoy

**College of Fine Arts, 1967**  
Best Musical as Producer, *A Gentleman's Guide to Love and Murder* (2014); Best Play as Producer, *Vanya and Sonia and Masha and Spike* (2013); Best Revival (Play) as Producer, *The Norman Conquests* (2009)

## Peggy Eisenhauer

**College of Fine Arts, 1983**  
Lighting Design, *Lucky Guy* (2013), *Assassins* (2004), *Bring in 'da Noise, Bring in 'da Funk* (1996)

## Katie Finneran

**College of Fine Arts, 1989–1990**  
Best Actress, Featured Role (Musical), *Promises, Promises* (2010); Best Actress, Featured Role (Play), *Noises Off* (2002)

## Jules Fisher

**College of Fine Arts, 1960**  
Lighting Design, *Lucky Guy* (2013), *Assassins* (2004), *Bring in 'da Noise, Bring in 'da Funk* (1996), *Jelly's Last Jam* (1992), *The Will Rogers Follies* (1991), *Grand Hotel* (1990), *Dancin'* (1978), *Ulysses in Nighttown* (1974), *Pippin* (1973)



## Sutton Foster

**College of Fine Arts, 1992–1993**  
Best Actress (Musical), *Anything Goes* (2011), *Thoroughly Modern Millie* (2002)

## Herb Gardner

**College of Fine Arts, 1956**  
Best Play, *I'm Not Rappaport* (1986)

## Renée Elise Goldsberry

**College of Fine Arts, 1993**  
Best Actress, Featured Role (Musical), *Hamilton* (2016)

## Cherry Jones

**College of Fine Arts, 1978**  
Best Actress (Play), *Doubt* (2005), *The Heiress* (1995)

## Pamela Winslow Kashani

**College of Fine Arts, 1987**  
Best Musical as Producer, *Memphis* (2010)

## John Arthur Kennedy

**College of Fine Arts, 1936, 1966**  
Best Actor, Supporting or Featured (Dramatic), *Death of a Salesman* (1949)

## Eugene Lee

**College of Fine Arts, 1962**  
Scenic Designer, *Wicked* (2004), *Sweeney Todd* (1979), *Candide* (1974)

## Judith Light

**College of Fine Arts, 1970**  
Best Actress, Featured Role (Play), *The Assembled Parties* (2013), *Other Desert Cities* (2012)

## Patina Miller

**College of Fine Arts, 2006**  
Best Actress (Musical), *Pippin* (2013)

## Roger Morgan

**College of Fine Arts, 1961**  
Lighting Design, *The Crucifer of Blood* (1979)

## Leslie Odom Jr.

**College of Fine Arts, 2003**  
Best Actor (Musical), *Hamilton* (2016)

## Martin Platt

**College of Fine Arts, 1971**  
Best Play as Producer, *Vanya and Sonia and Masha and Spike* (2013)

## Billy Porter

**College of Fine Arts, 1991**  
Best Actor (Musical), *Kinky Boots* (2013)

## Ellis Rabb

**College of Fine Arts, 1953**  
Best Director (Play), *The Royal Family* (1976)

## Lester Rawlins

**College of Fine Arts, 1950**  
Best Actor, Featured Role (Play), *Da* (1978)

## Ann Roth

**College of Fine Arts, 1953**  
Best Costume Design (Play), *The Nance* (2013)

## Mel Shapiro

**College of Fine Arts, 1961**  
Best Book (Musical), *Two Gentlemen of Verona* (1972)

## Sada Thompson

**College of Fine Arts, 1949**  
Best Actress (Dramatic), *Twigs* (1972)

## Tamara Tunie

**College of Fine Arts, 1981**  
Best Musical as Producer, *Spring Awakening* (2007)

AND FOR THE ORIGINALS WHO USE THEIR CREATIVE

TALENTS TO BRING PURE MAGIC TO THE STAGE AND ENTHRALL US WITH THEIR INGENUITY





#MADEBYAFOUNDER

Originally known as the “pound sign,” the hashtag is now ubiquitous in social media, allowing people to tag, group and search posts by subject — a concept first proposed on Twitter in 2007 by CMU alumnus **Chris Messina**.

## Tag, you're it.

One simple action online could lead to your identity being stolen. Tagging friends in a photo may seem harmless, but privacy expert and CMU Professor **Alessandro Acquisti** is proving otherwise. By combining social media with facial recognition software, public records and cloud computing, he demonstrated how easy it is to identify strangers, gain their personal information, predict their interests and sometimes even get access to sensitive identifiers such as Social Security numbers.







All drive, no driver.

University Professor and world-renowned roboticist **Red Whittaker** has been fueling his drive to develop autonomous modes of transportation since 1973. His creations have searched for fallen meteorites in the ice fields of Antarctica, ventured into the craters of active volcanoes in Alaska, cleaned up nuclear waste at Three Mile Island and won the \$2 million DARPA Urban Challenge, a prestigious long-distance road race. For his next project, he's shooting for the moon, developing space robotics technology with the goal of taking payloads to our lunar neighbor and beyond.

AND FOR THE REVOLUTIONARIES WHO CONQUER UNKNOWN

TERRAINS, OPENING UP NEW ROADS OF POSSIBILITY THAT SPAN THE ENTIRE UNIVERSE



With thousands of hours of video footage,  
it can be hard to find  
the most critical moments.

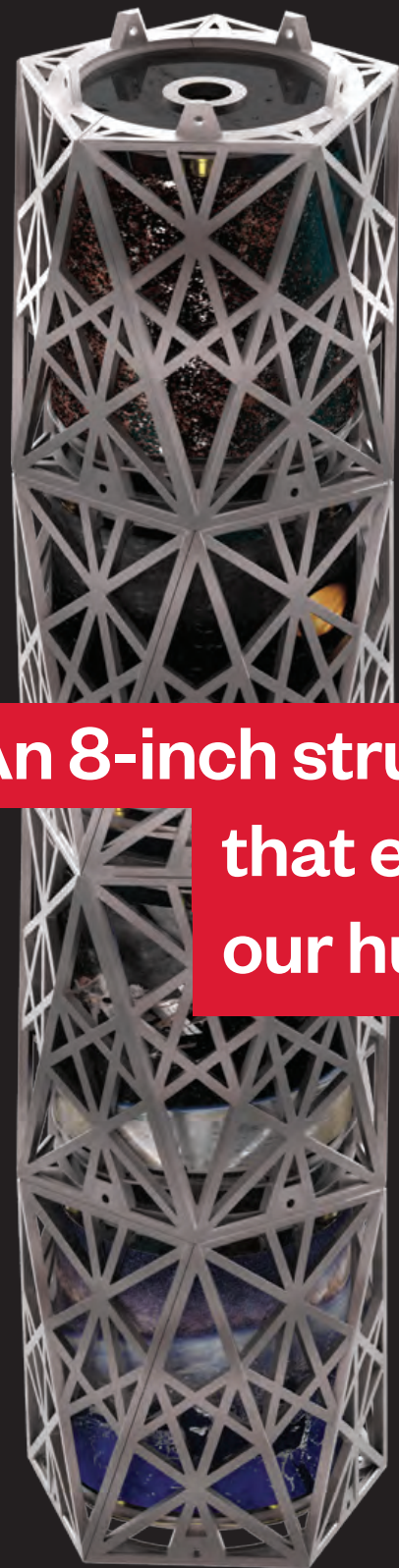


In the era of social media, where video is more prominent and abundant than ever before, CMU Professor **Jay Aronson** is finding more efficient ways to watch it all. To improve the way we monitor conflicts and human rights violations, the history faculty member is collaborating with colleagues in the School of Computer Science to harness powerful machine learning and computer vision-based techniques pioneered at Carnegie Mellon. The video analysis system they developed filters out irrelevant material and automatically tags videos that contain specific objects, actions, sounds or language that indicate war crimes, human rights violations and other atrocities. Other tools synchronize and geolocate video lacking metadata so that it can be used to reconstruct events over time and space.

Aronson and his colleagues are working with conflict-monitoring and human rights organizations around the world to implement these systems. The ultimate goal of this work is to make the documentation of human rights violations simpler and more convincing.







A collaboration of more than 300 artists, designers, educators, scientists, choreographers, poets, fabricators, technologists, writers, scholars and musicians, the MoonArk is a sculpture containing hundreds of images, poems, music, nano objects and earthly samples that will be sent to the moon aboard an Astrobotic Lander.

Led by Professor **Mark Baskinger** and retired Professor **Lowry Burgess**, who previously curated the first art payload taken into space in 1989, the tiny museum of human history weighs in at just 8 ounces and is designed to last thousands of years.

An 8-inch structure  
that encapsulates  
our humanity.

AND FOR THE FUTURISTS WHO THINK LIGHT-YEARS



A chemical  
process  
that enhances  
our lives.

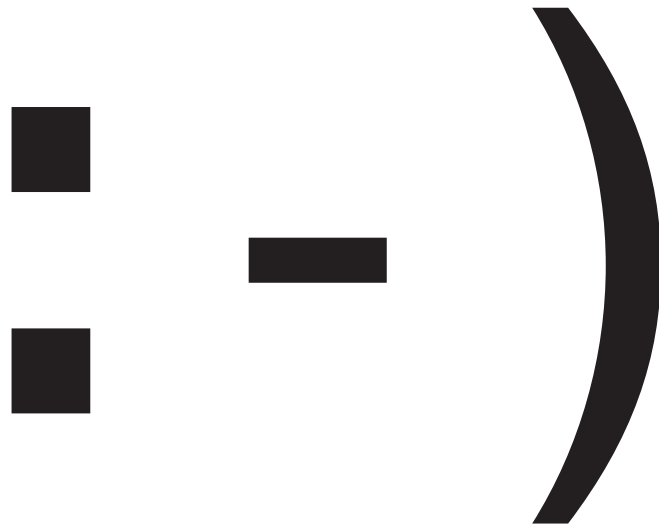


Thanks to Atom Transfer Radical Polymerization, cars get better gas mileage and paints are brighter than they were 20 years ago. Invented by University Professor **Krzysztof Matyjaszewski** in 1995, this chemical process revolutionized macromolecular engineering by enabling precise control over molecular architecture and function, resulting in better, smarter materials. ATRP has been used by companies worldwide to make many products that impact diverse fields, including appliances, automotive manufacturing and cosmetics.

AHEAD AND THE CHEMISTS WHOSE REACTIONS TOUCH OUR LIVES IN INNUMERABLE WAYS

# Computer scientists can be pretty funny.

No really, that's not a joke. If it were, we might put a smiley-face emoticon after it—like the one CMU Professor **Scott Fahlman** invented to distinguish sarcastic “joke” posts from serious ones in his department’s online message boards. It’s been 35 years since that digital grin made its first appearance. From this small beginning evolved whole families of text-based emoticons and then, in 1999, the emoji used billions of times per day.



1982



2017

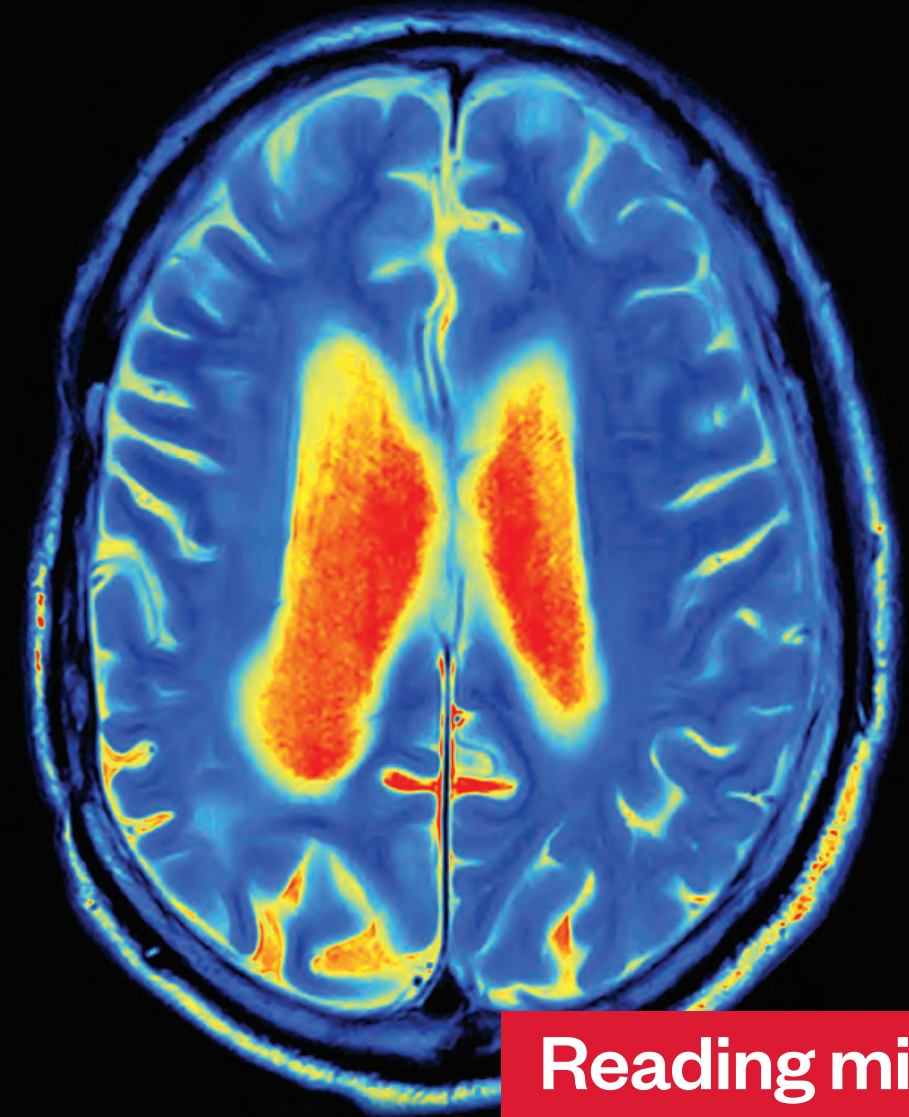




## Studying crimes.

University Professor **Alfred Blumstein** has led a life of crime—specifically, understanding why people commit it and how likely they are to offend again. By reviewing existing knowledge on the frequency and duration at which someone commits crimes, Blumstein developed a framework for collecting information about individual criminal careers and their parameters, while also describing how this information can be used to refine the justice system. Known as one of the top researchers in criminology and operations research in 21st-century America, his work has reshaped the way we think about things like crime measurement, sentencing and prison populations, demographic trends, and drug-enforcement policy.

AND FOR THE INVESTIGATORS WHO DIG DEEP TO UNCOVER INFORMATION



## Reading minds.

“Mind reader” and University Professor **Marcel Just** is using new brain imaging techniques to identify the content of thoughts. By analyzing the patterns from an fMRI, Just is able to determine if someone is thinking of a familiar object, experiencing an emotion or reading a sentence. This method of brain imaging can be used for diagnosing psychiatric disorders by detecting alterations in thought patterns, and for enhancing the way individual scientific concepts come to be represented in a person’s brain.

AND THE ANALYSTS WHO GIVE US GLIMPSES OF THE INNER WORKINGS OF THE HUMAN MIND



# THE HIGHEST ACCOLADE IN HOLLYWOOD.



Earned by  
these founders.

## Kiran Bhat

**School of Computer Science, 2004**  
Technical Achievement, for the design and development of the ILM facial performance-capture solving system (2016)

## Holly Hunter

**College of Fine Arts, 1980**  
Best Actress in a Leading Role, *The Piano* (1993)

## Drew Olbrich

**School of Computer Science, 1992**  
Technical Achievement, for creating the Light system for computer graphics lighting at PDI/DreamWorks (2013)

## Iain Matthews

**School of Computer Science  
Adjunct Faculty**  
Scientific and Engineering, for the design, engineering and development of the FACETS facial performance capture and solving system at Weta Digital (2016)

## Ann Roth

**College of Fine Arts, 1953**  
Best Costume Design, *The English Patient* (1996)

## Richard Shoup

**College of Engineering, 1965,  
School of Computer Science, 1970**  
Scientific and Engineering, for pioneering efforts in the development of digital paint systems (1997)

## Stephen Schwartz

**College of Fine Arts, 1968**  
Best Music, Original Song, "When You Believe" from *The Prince of Egypt* (1998) and "Colors of the Wind" from *Pocahontas* (1995)

Best Music, Original Musical or Comedy Score, *Pocahontas* (1995)

©AMPAS.





## Saving lives.

The U.S. opioid epidemic is just the latest wave of harmful drug activity that concerns University Professor **Jonathan Caulkins**. As a public policy expert, he models markets, the efficacy of interventions and the effects of enforcement. In doing so, he has uncovered surprising pathways that lead to drug use, and has championed data-driven reforms that limit the abuse of both legal and illegal drugs. Knowing that no single change will end narcotics abuse, Caulkins instead works for common-sense approaches that reduce societal costs and emphasize helping people with treatments that work.



## Skipping lines.

If you've signed up for TSA PreCheck, you know how amazing it feels to breeze through the security line and keep your shoes on. Also pretty amazing? A precursor to the PreCheck system was designed by a **Heinz College** student team in 2003.



# ARTIFICIAL INTELLIGENCE WITH REAL UNDERSTANDING.



For CMU researcher **Rita Singh**, artificial intelligence that simply understands the content of human speech isn't enough. Through her research, she is producing algorithms that allow computers to understand and respond to humans by gauging their persona, their intent, their background and their environment through voice alone, all with an acuity that surpasses that of the human brain. Because a person's voice is as unique to them as their fingerprint or DNA, researchers could potentially build a profile of any human on earth just by listening to an audio recording of their voice.



**Microchip.**



**Macro impact.**



In the early '90s, University Professor **José Moura** and then-Ph.D. student **Aleksandar Kavcic** observed that disk drives were getting smaller and smaller — but the amount of data being stored was only growing. With the chasm between size and storage needs ever expanding, they were concerned about the ability to accurately recover and successfully read stored bits of data. Together they developed technology that enabled chips to read data from high-speed, high-performance disk drives with as few errors as possible. From large servers to laptops, their patented design has been used in more than 3 billion computers.



# discoverers

3-D-printed human tissue.

Made possible by  
a founder.



By hacking a 3-D printer to allow it to print soft biological materials, Professor **Adam Feinberg** and his team can create human tissue from scratch — a major feat in the world of medical research. Ultimately, his work could allow doctors to see how patients would react to different treatments without clinical trials or animal testing, to repair a heart without a transplant — and even to generate an entire human organ.







## Lighting the way for safer, cleaner hospitals.

Photocatalysts use light to generate hydrogen and suppress the growth of microorganisms on surfaces. But usually they either are highly toxic or don't perform well. Professors **Mohammad Islam, Paul Salvador** and **Greg Rohrer** solved this problem by separating the photocatalysis half-reactions into different channels using nanomaterials, resulting in increased performance in visible light. Their progress could give hospitals a safer, more effective way to disinfect surfaces and even kill drug-resistant bacteria by using photocatalysts and visible light instead of ultraviolet light.





**Ingenuity knows no borders.**



Recognizing the need to transform the educational landscape worldwide, Carnegie Mellon opened its campus in **Qatar** in 2004, and became the first U.S. research university with an in-country presence in Africa with the opening of its **Rwanda** campus in 2012. Today, CMU Qatar proudly boasts 400 students from more than 40 countries, and CMU Africa has awarded master's degrees in information technology and electrical and computer engineering to more than 100 graduates.

AND FOR THE VOYAGERS WHO CROSS OCEANS AND CONTINENTS TO BRING OPPORTUNITIES

TO UNDERSERVED POPULATIONS



# THE MOST IMPRESSIVE ACHIEVEMENT IN COMPUTER SCIENCE.



© 2012 Association for Computing Machinery.

Attained by  
these founders.

## Shafi Goldwasser

Mellon College of Science, 1979  
2012

## Leslie Gabriel Valiant

School of Computer Science  
Former Faculty  
2010

## Edmund Clarke

School of Computer Science/  
College of Engineering Faculty  
2007

## Manuel Blum

School of Computer  
Science Faculty  
1995

## Edward Feigenbaum

College of Engineering, 1956;  
Tepper School, 1960  
1994

## Raj Reddy

School of Computer  
Science Faculty  
1994

## Ivan Sutherland

College of Engineering, 1959  
1988

## Robert Floyd

School of Computer Science  
Former Faculty  
1978

## Dana Scott

Dietrich College/Mellon College  
of Science/School of Computer  
Science Emeritus Faculty  
1976

## Allen Newell

School of Computer Science  
Former Faculty  
1975

## Herbert Simon

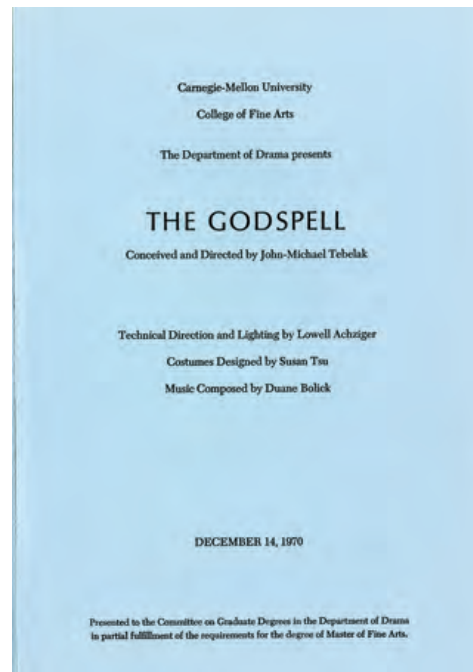
Dietrich College/  
School of Computer Science/  
Tepper School Former Faculty  
1975

## Alan Perlis

Mellon College of Science, 1942;  
School of Computer Science  
Former Faculty  
1966 (the first ever awarded)



They wrote  
the masterpiece.



What began as **John-Michael Tebelak's** master's thesis project became an international sensation, appearing in theaters from Broadway to Brazil. *Godspell*, hailed for its unique take on the last days of Jesus Christ, became a collaboration with fellow CMU alumnus **Stephen Schwartz**—and its first production was right here at Carnegie Mellon in 1970.

Creators



**Susan Tsu**, costume designer, CMU alumna and University Professor, is a veritable superstar in the world of theater, creating wearable works of art that send a powerful message and capture the true essence of a character. While her name might not appear in marquee lights, it's well recognized in the industry as synonymous with imagination and innovation. Tsu's designs have appeared on stages across the globe, but her first major pieces—and arguably her most famous—were the hippie-clown costumes she designed for the original production of *Godspell* at Carnegie Mellon's Studio Theatre.

She dressed  
the parts.





**Girl Processes Daily Ration  
of Early Rice**

Copyright Edda L. Fields-Black

Once unmourned  
and unmarked.

Now honored

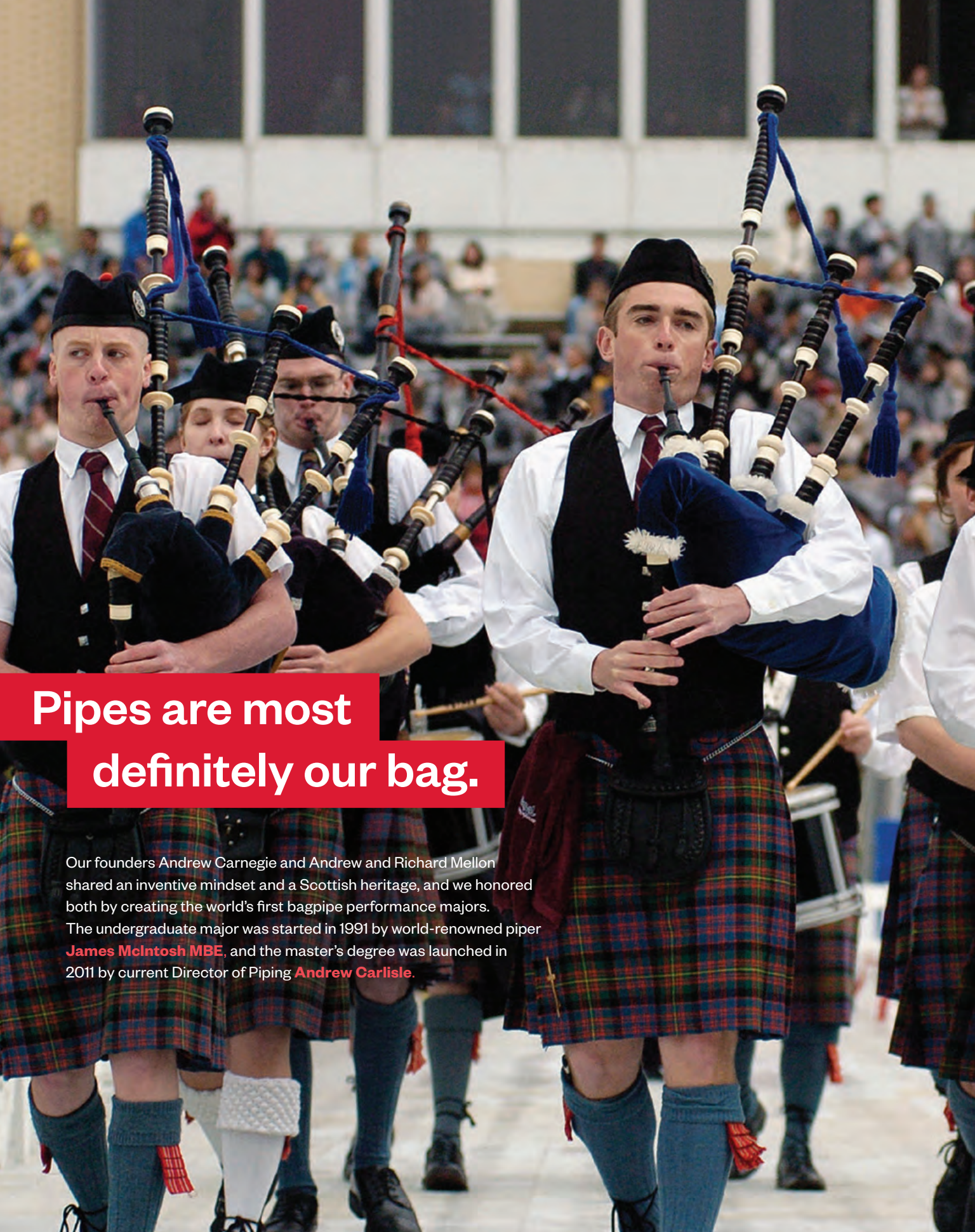
and celebrated.

A tribute to those enslaved and brutalized on rice plantations in the Lowcountry of South Carolina and Georgia, Professor **Edda L. Fields-Black's** *Requiem for Rice* was selected by Carnegie Mellon's Center for the Arts in Society Performance Initiative for 2015–2017. This modern take on a classic requiem features a full symphony orchestra and choir, as well as West African dance, drumming and singing, and African-American spirituals. Fields-Black wanted to recognize the exploited laborers who helped launch and sustain, yet never profited from, the commercial rice industry of the South, and to create something beautiful out of an otherwise painful history of enslavement.

*Requiem* ends in a celebration of the lives, ingenuity and sacrifices of African ancestors, reclaiming history and culture for future generations and reconciling peoples of African, African-American and European descent.





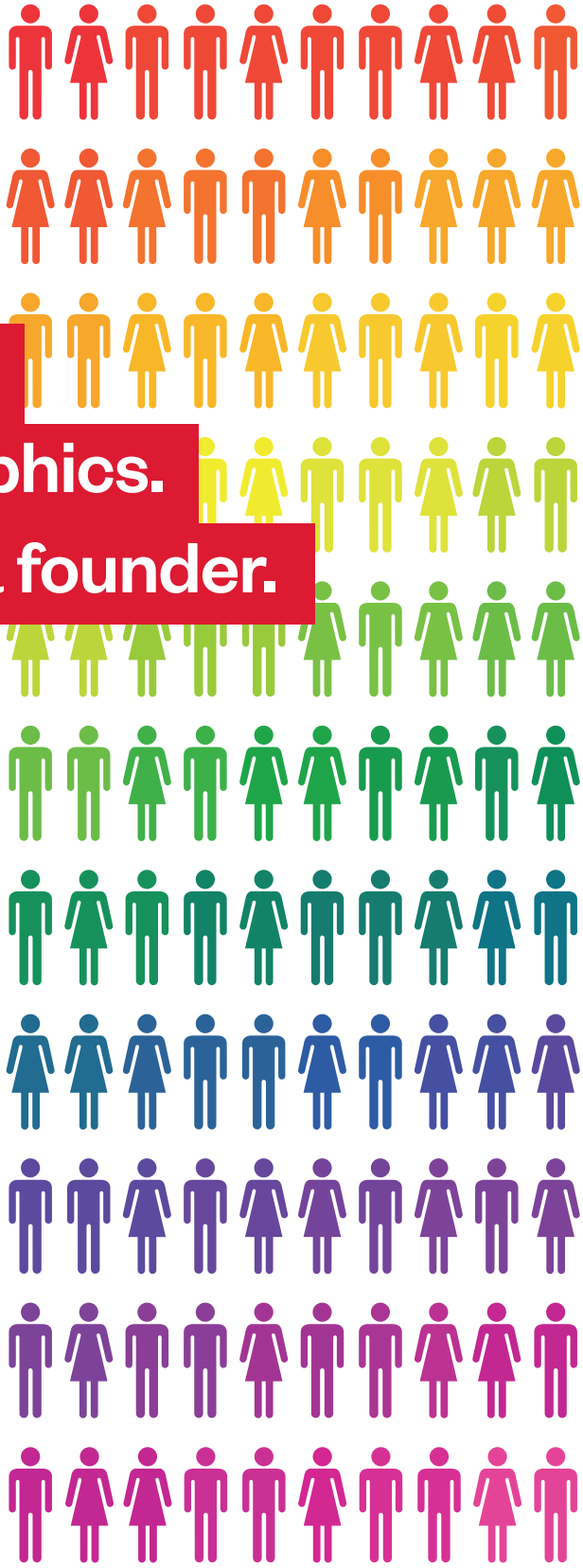


**Pipes are most definitely our bag.**


Our founders Andrew Carnegie and Andrew and Richard Mellon shared an inventive mindset and a Scottish heritage, and we honored both by creating the world's first bagpipe performance majors. The undergraduate major was started in 1991 by world-renowned piper **James McIntosh MBE**, and the master's degree was launched in 2011 by current Director of Piping **Andrew Carlisle**.

**More inclusive and accurate demographics. Brought to you by a founder.**

CMU Professor **Lowell Taylor** was the co-author of the first paper studying the gay and lesbian population to ever appear in the flagship journal *Demography*. By demonstrating how data from the U.S. Census can be used to study same-sex couples, he helped launch the rapid growth of a new subfield of demographic studies that assists social scientists and is used in making better-informed public policy.

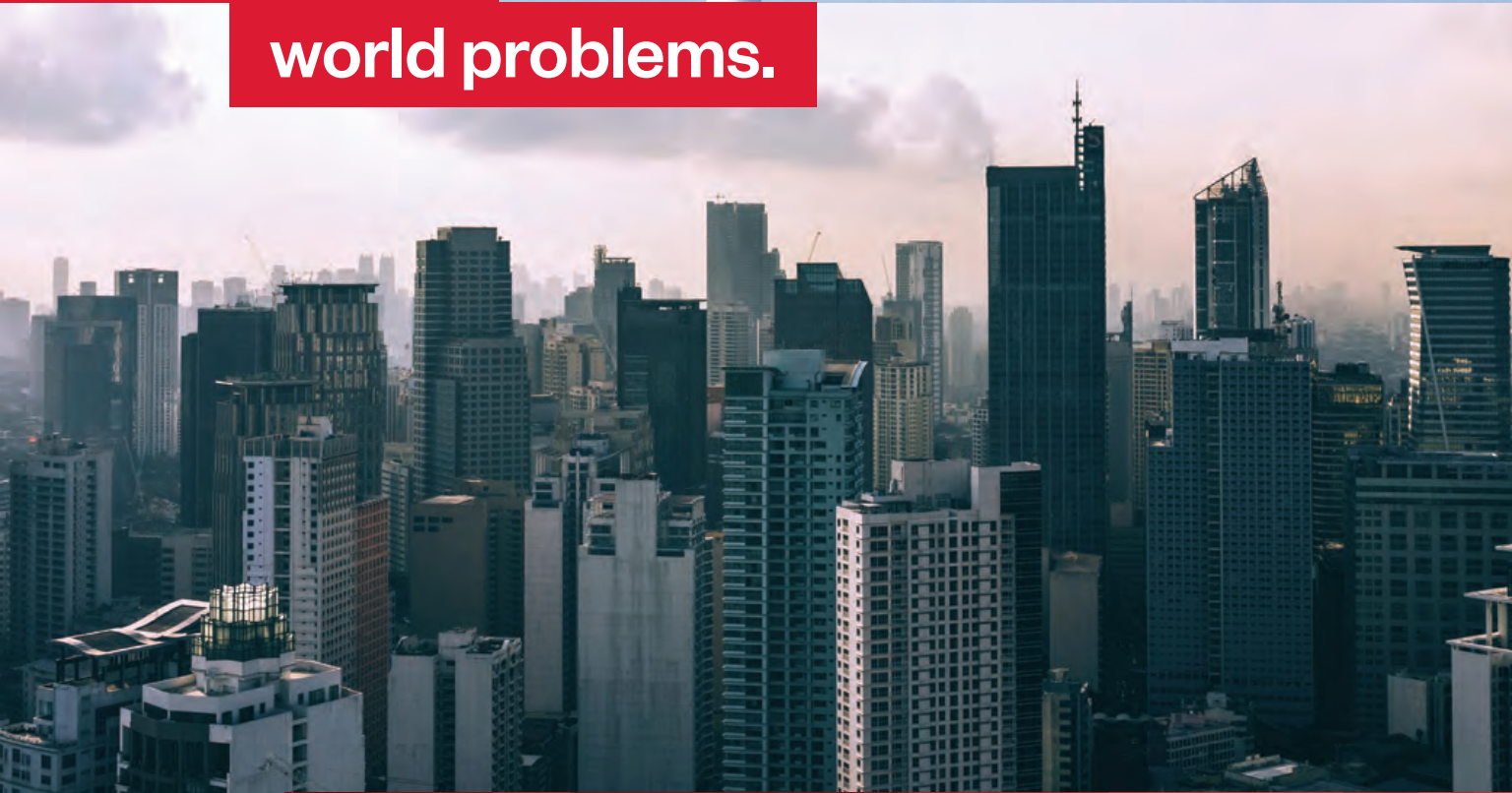






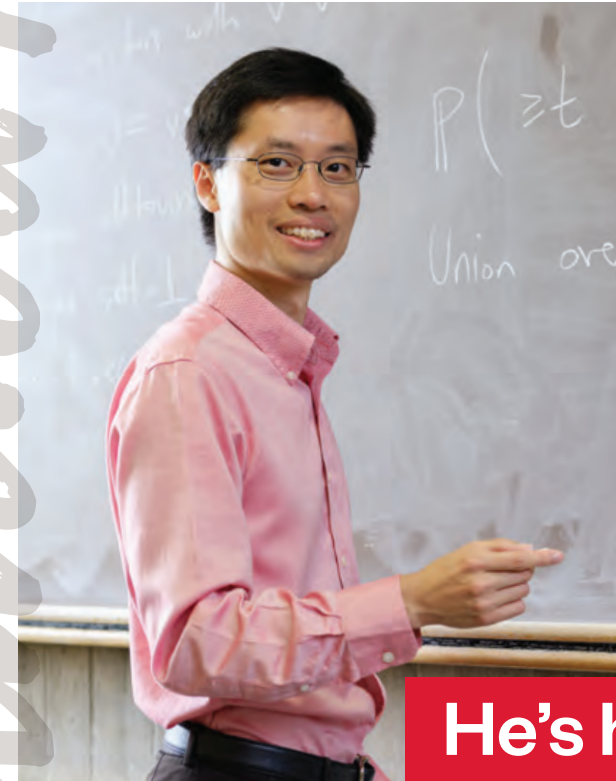
Our 21st-century society faces a host of complex problems, including inequality, climate change and forced migration, among many others. School of Design Professor and Head **Terry Irwin** and her colleagues have created a new field of research, practice and study—Transition Design—that is aimed at helping societies transition toward more sustainable futures. Its goal is not modest: the reconception of entire lifestyles to embrace Cosmopolitan Localism, which is more place-based and convivial, yet sophisticated in its global awareness and exchange of technology.

**She's solving  
world problems.**



AND FOR THE GAME-CHANGERS WHO SET THEIR SIGHTS ON A SUSTAINABLE

educators



**He's helping you  
solve yours.**

Professor **Po-Shen Loh** is a math evangelist, for whom math education is a creative endeavor. As the founder of Expii, a free personalized learning platform, he is transforming the way people learn math: focusing on engagement and personal challenge rather than standardized achievement.

His algorithms match learners with questions and explanations at their level, informed by his real-life experience as coach of the United States International Mathematical Olympiad team, which placed first out of more than 100 countries in back-to-back years. Loh is determined to change the way society views math—and he's achieving this vision one problem at a time.

FUTURE AND THE EDUCATORS WHO APPROACH LEARNING WITH INFECTIOUS ENTHUSIASM





**More power to you.**



A.I.-powered robotic assistants aren't just a futuristic fantasy. Thanks to CMU Professor **Henny Admoni**, intelligent, autonomous robots can help people live richer lives. Her robots help people with disabilities complete complex daily tasks independently. By developing algorithms grounded in human behavior research, she created robots that are able to detect, interpret and respond to verbal and nonverbal communication, improving the way assistive robots and humans interact. These robots include home assistants, educational tutors and therapy tools for people with social deficits.



**More empowerment to her.**

CMU Professor **Linda Babcock** focuses her research on finding out what factors hold women back from asking for what they want. Her book *Women Don't Ask: Negotiation and the Gender Divide*, recognized by *Fortune* magazine as one of the 75 smartest business books of all time, empowered women to speak up in the workplace and inspired the first Girl Scout badge for negotiation.



# MASTERING THE LEARNING CURVE.



Just like people, organizations have learning curves that affect their productivity. Perhaps no one understands this better than CMU Professor **Linda Argote**, who literally wrote the book on the subject. Argote's book *Organizational Learning: Creating, Retaining and Transferring Knowledge* set the standard for research and analysis in the field, and is considered to be the foremost publication on the topic today.





“Can you hold the  
elevator door, please?”

Makers

It's common to hear this request from a colleague or fellow hotel guest. At Carnegie Mellon, you might hear it from a robot. CoBots, developed by University Professor **Manuela Veloso**, are robots that use symbiotic autonomy, which makes them aware of their perceptual, physical and reasoning limitations and allows them to proactively ask for help from humans. They can be found regularly navigating our hallways — so don't be startled if one stops and asks you for help getting on the elevator.





# TELEVISION'S TOP HONOR.

Awarded to these founders.



## Alana Billingsley

**College of Fine Arts, 2004**  
Primetime Emmy® for Outstanding Art Direction for Variety or Nonfiction Programming, *The 54th Annual Grammy Awards* (2012)

## Steven Bochco

**College of Fine Arts, 1966**  
Primetime Emmys for Outstanding Drama Series, *NYPD Blue* (1995), *L.A. Law* (1987, 1989), *Hill Street Blues* (1981, 1982, 1983, 1984); Outstanding Writing for a Drama Series, *L.A. Law* (1987), *Hill Street Blues* (1981, 1982)

## Nanrose Buchman

**College of Fine Arts, 1976**  
Primetime Emmy for Outstanding Costumes for a Series, *Fame* (1987)

## Casey Childs

**College of Fine Arts, 1978, 1980**  
Daytime Emmys for Outstanding Drama Series Directing Team, *All My Children* (2003), *Another World* (1992)

## John Conboy

**College of Fine Arts, 1956**  
Daytime Emmys for Outstanding Drama Series, *Santa Barbara* (1990), *The Young and the Restless* (1975, 1983); Outstanding Drama Special, *The ABC Afternoon Playbreak* for Episode "The Other Woman" (1974)

## James Cromwell

**College of Fine Arts, 1964**  
Primetime Emmy for Outstanding Supporting Actor in a Miniseries or Movie, *American Horror Story: Asylum* (2013)

## Ted Danson

**College of Fine Arts, 1972**  
Primetime Emmys for Outstanding Lead Actor in a Comedy Series, *Cheers* (1990, 1993)

## Bob Finkel

**College of Fine Arts, 1940**  
Primetime Emmys for Outstanding Variety Music or Comedy Series, *The Andy Williams Show* (1966, 1967)

## James Frawley

**College of Fine Arts, 1959**  
Primetime Emmy for Outstanding Directing for a Comedy Series, *The Monkees* (1967)

## Will Gossett

**College of Fine Arts, 2015**  
Primetime Emmy for Outstanding Lighting Design/Lighting Direction for a Variety Special, *Grease: Live* (2016)

## Christopher Goutman

**College of Fine Arts, 1976**  
Daytime Emmys for Outstanding Direction for a Drama Series, *One Life to Live* (2014), *As the World Turns* (2007), *All My Children* (1995); Outstanding Drama Series, *As the World Turns* (2001, 2003)

## Mariette Hartley

**College of Fine Arts, 1965**  
Primetime Emmy for Outstanding Lead Actress in a Drama Series, *The Incredible Hulk* (1979)

## Brian Hemesath

**College of Fine Arts, 1997**  
Daytime Emmys for Outstanding Costume Design/Styling, *Sesame Street* (2011, 2015)

## Michael Hissrich

**College of Fine Arts, 1988**  
Primetime Emmys for Outstanding Drama Series, *The West Wing* (2001, 2002); Outstanding Special Class Program, *The West Wing: Documentary Special* (2002)

## Holly Hunter

**College of Fine Arts, 1980**  
Primetime Emmys for Outstanding Lead Actress in a Miniseries or a Special, *The Positively True Adventures of the Alleged Texas Cheerleader-Murdering Mom* (1993), *Roe vs. Wade* (1989)

## Douglas Huszti

**College of Fine Arts, 1994**  
Primetime Emmy for Outstanding Art Direction for a Single-Camera Series, *Boardwalk Empire* (2011)

## Romain Johnston

**College of Fine Arts, 1951**  
Primetime Emmys for Outstanding Art Direction for Variety or Nonfiction Programming, *The Sentry Collection Presents Ben Vereen: His Roots* (1978), *The Mac Davis Show* (1977)

## Cherry Jones

**College of Fine Arts, 1978**  
Primetime Emmy for Outstanding Supporting Actress in a Drama Series, *24* (2009)

## Jack Klugman

**College of Fine Arts, 1948**  
Primetime Emmys for Outstanding Continued Performance by an Actor in a Leading Role in a Comedy Series, *The Odd Couple* (1971, 1973); Outstanding Single Performance by an Actor in a Leading Role, *The Defenders* (1964)

## Suttirat Anne Larlarb

**College of Fine Arts, Past Faculty**  
Primetime Emmy for Outstanding Art Direction for Variety or Nonfiction Programming, *London 2012 Olympic Games Opening Ceremony* (2013)

## Eugene Lee

**College of Fine Arts, 1962**  
Primetime Emmys for Outstanding Production Design for a Variety, Nonfiction, Reality or Reality-Competition Programming, *Saturday Night Live* with host Alec Baldwin (2017); Outstanding Art Direction for Variety or Nonfiction Programming, *Saturday Night Live* with host Justin Timberlake/host Martin Short/host Ben Affleck (2013)

## Jared Leese

**College of Fine Arts, 1995**  
Daytime Emmys for Outstanding Costume Design/Styling, *Sesame Street* (2011, 2015)

## Alfred Lehman

**College of Fine Arts, 1949, 1950**  
Primetime Emmy for Outstanding Costumes for a Series, *Murder, She Wrote* (1986)

## Andrew Leitch

**College of Fine Arts, 2012**  
Primetime Emmy for Outstanding Production Design for a Narrative Program, Half-Hour or Less, *Veep* (2017)

## Judith Light

**College of Fine Arts, 1970**  
Daytime Emmys for Outstanding Actress in a Drama Series, *One Life to Live* (1980, 1981)

AND FOR THE ARTISTS WHO ENRAPTURE US WITH THEIR GRIPPING PERFORMANCES ON

SCREENS ALL OVER THE COUNTRY



## Kenneth Love

**College of Fine Arts, 1976**

News and Documentary Emmy for Outstanding Individual Achievement in a Craft — Sound, *Realm of the Alligator* (1987)

## Marilyn Lowey

**College of Fine Arts, 1976**

Primetime Emmy for Outstanding Lighting Direction (Electronic) for a Miniseries or Special, *Neil Diamond... Hello Again* (1986)

## Mark Malmberg

**College of Fine Arts, 1979**

News and Documentary Emmy for Outstanding Individual Achievement in Design, *MSNBC ID Package* (1996); Primetime Emmy for Outstanding Main Title Design, *MTV Liquid TV* (1992)

## Sonia Manzano

**College of Fine Arts, 1972**

Daytime Emmys for Outstanding Writing in a Children’s Series, *Sesame Street* (1984, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1994, 1995, 1998, 1999, 2001, 2002, 2003)

## Nancy Marchand

**College of Fine Arts, 1949**

Primetime Emmys for Outstanding Supporting Actress in a Drama Series, *Lou Grant* (1980, 1981, 1982); Outstanding Continuing Performance by a Supporting Actress in a Drama Series, *Lou Grant* (1978)

## Rob Marshall

**College of Fine Arts, 1982**

Primetime Emmys for Outstanding Choreography, *Tony Bennett: An American Classic* (2007), *Annie* (2002); Outstanding Directing for a Variety Special, *Tony Bennett: An American Classic* (2007); Outstanding Variety, Music or Comedy Special, *Tony Bennett: An American Classic* (2007)

## Noel Maxam

**College of Fine Arts, 1990**

Daytime Emmys for Outstanding Drama Series Directing Team, *The Young and the Restless* (1998, 1999, 2001, 2002)

## John McDaniel

**College of Fine Arts, 1983**

Daytime Emmys for Outstanding Talk Show, *The Rosie O'Donnell Show* (2001, 2002)

## John Ford Noonan

**College of Fine Arts, 1966**

Primetime Emmy for Outstanding Writing for a Drama Series, *St. Elsewhere* (1984)

## Daniel Orlandi

**College of Fine Arts, 1976**

Primetime Emmy for Outstanding Costumes for a Variety Program or Special, *The Magic of David Copperfield XI: The Explosive Encounter* (1989)

## Jill Farren Phelps

**College of Fine Arts, 1972**

Daytime Emmys for Outstanding Drama Series, *The Young and the Restless* (2014, 2015), *General Hospital* (2005, 2006, 2008, 2012), *Santa Barbara* (1988, 1989, 1990); Outstanding Achievement in Design Excellence for a Drama Series, *General Hospital* (1982); Outstanding Special Class Special, *The Young and the Restless: Tribute to Jeanne Cooper* (2014)

## Michael Pressman

**College of Fine Arts, 1972**

Primetime Emmys for Outstanding Drama Series, *Picket Fences* (1993, 1994)

## John Shaffner

**College of Fine Arts, 1976**

Primetime Emmys for Outstanding Art Direction for a Multi-Camera Series, *George Lopez* (2005); Outstanding Art Direction for Variety or Nonfiction Programming, *The Magic of David Copperfield XV: Fires of Passion* (1993), *The Magic of David Copperfield XIV: Flying — Live the Dream* (1992), *The Magic of David Copperfield XIII: Mystery on the Orient Express* (1991); Daytime Emmys for Outstanding Achievement in Art Direction/Set Decoration/Scenic Design, *Ellen: The Ellen DeGeneres Show* (2004, 2007)

## Richard Shoup

**College of Engineering, 1965**

**School of Computer Science 1970**
Technical and Engineering Emmy for Outstanding Achievement, Engineering Development, concept and development of the first electronics graphics creative system (1983)

## Gary Smith

**College of Fine Arts, 1956**

Primetime Emmys for Outstanding Variety, Music or Comedy Special, *The 51st Annual Tony Awards* (1998), *Barbra: The Concert* (1995), *Baryshnikov on Broadway* (1980), *Steve & Eydie Celebrate Irving Berlin* (1979), *Bette Midler: Ol' Red Hair Is Back* (1978), *Singer Presents Burt Bacharach* (1971); Outstanding Art Direction for a Series, *Perry Como’s Kraft Music Hall* (1962); News and Documentary Emmy for Outstanding News and Documentary Program Achievement — Programs and Segments, *ABC 2000: The Millennium* (2000)

## Joe Stewart

**College of Fine Arts, 1977**

Primetime Emmys for Outstanding Art Direction for a Variety or Nonfiction Programming, *The Magic of David Copperfield XV: Fires of Passion* (1993), *The Magic of David Copperfield XIV: Flying — Live the Dream* (1992), *The Magic of David Copperfield XIII: Mystery on the Orient Express* (1991); Daytime Emmys for Outstanding Achievement in Art Direction/Set Decoration/Scenic Design, *Ellen: The Ellen DeGeneres Show* (2004, 2007)

## Brian Stonestreet

**College of Fine Arts, 1988**

Primetime Emmys for Outstanding Art Direction for Variety or Nonfiction Programming, *The 54th Annual Grammy Awards* (2012), *The 47th Annual Grammy Awards* (2005), *The 42nd Annual Grammy Awards* (2000)

## Scott Storey

**College of Fine Arts, 1985**

Primetime Emmy for Outstanding Art Direction for Variety, Music or Nonfiction Programming, *2008 MTV Video Music Awards* (2009)

## Chikako Suzuki

**College of Fine Arts, 2004**

Primetime Emmy for Outstanding Art Direction for Contemporary Program, Half-Hour or Less, *House of Lies* (2014)

## Ryan Tanker

**College of Fine Arts, 2010**

Primetime Emmy for Outstanding Lighting Design/Lighting Direction for a Variety Special, *Grease: Live* (2016)

## Jack Taylor

**College of Fine Arts, 1973**

Primetime Emmy for Outstanding Art Direction for a Miniseries or Movie, *I’ll Be Home for Christmas* (1989)

## Bruce Weitz

**College of Fine Arts, 1966**

Primetime Emmy for Outstanding Supporting Actor in a Drama Series, *Hill Street Blues* (1984)

## Ken & Mitzie Welch

**College of Fine Arts, 1947 and 1954**

Primetime Emmys for Outstanding Original Music and Lyrics, *Linda in Wonderland* (1981), *The Sentry Collection Presents Ben Vereen: His Roots* (1978), *The Carol Burnett Show* (1976); Outstanding Achievement in Music Direction of a Variety, Musical or Dramatic Program, *Barbra Streisand...And Other Musical Instruments* (1974), Musician of the Year, *Barbra Streisand...And Other Musical Instruments* (1974)

## John Wells

**College of Fine Arts, 1979**

Primetime Emmys for Outstanding Drama Series, *The West Wing* (2000, 2001, 2002, 2003), *ER* (1996); Outstanding Special Class Program, *The West Wing Documentary Special* (2002)

## Connie Wexler

**College of Fine Arts, 1953**

Daytime Emmy for Outstanding Individual Achievement in Daytime Programming, *Search for Tomorrow* (1979)

## Bud Yorkin

**College of Engineering, 1948**

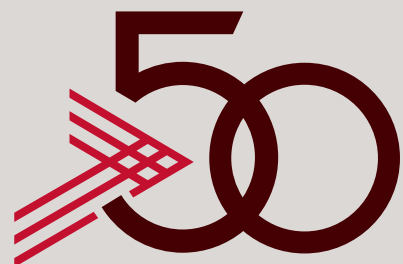
Primetime Emmys for Outstanding Directorial Achievement in Comedy, *The Jack Benny Program* (1960); Best Direction for a Single Musical or Variety Program, *An Evening with Fred Astaire* (1959); Best Writing for a Single Musical or Variety Program, *An Evening with Fred Astaire* (1959)





CMU Professor **Tiziana Di Matteo** is going boldly where no person has gone before—or at least allowing us to visualize what it would look like if she did. Di Matteo was the first to show where the giant black holes at the heart of every galaxy came from, using computer models of the universe. Through her collaborative team's massive visualizations of the cosmos using CMU's GigaPan technology, she's uncovering the mysteries of space and getting closer to understanding the origins of the universe.





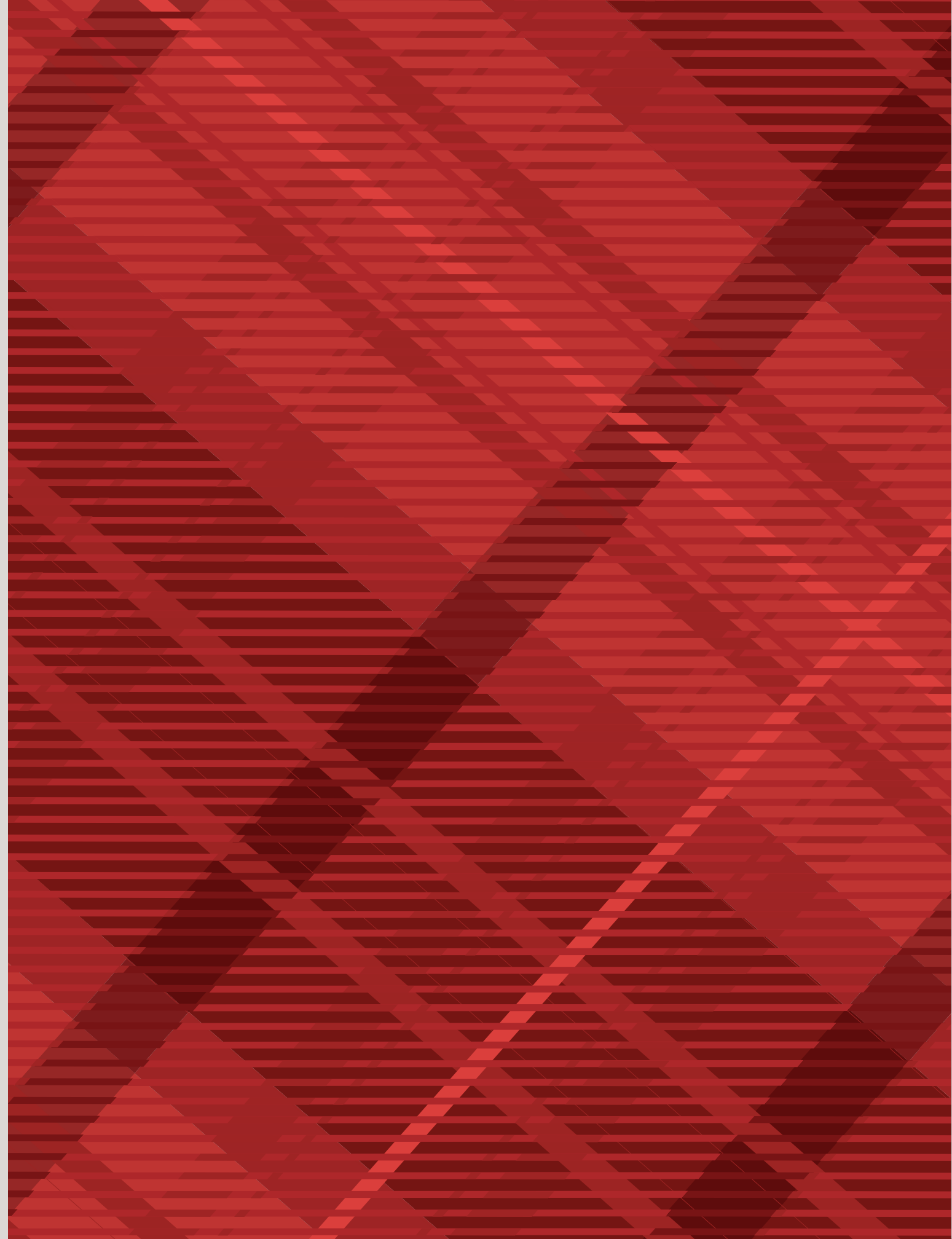
Today we celebrate our founders, who have accelerated progress over the last 50 years. Who have revolutionized our society with their vision. Who have transformed our daily lives with their innovations.

Their achievements are just the start.

With our eyes on the future, we eagerly await every new founder. Every person striving for the next great idea. Every collaboration that leads to greater advancements.

At Carnegie Mellon University, we boldly turn to the next pressing global challenge—knowing that our greatest impact is yet to come.

**This is for the founders.  
This is for our future.**





# Carnegie Mellon University

**2017**