

Building a Better Tomorrow



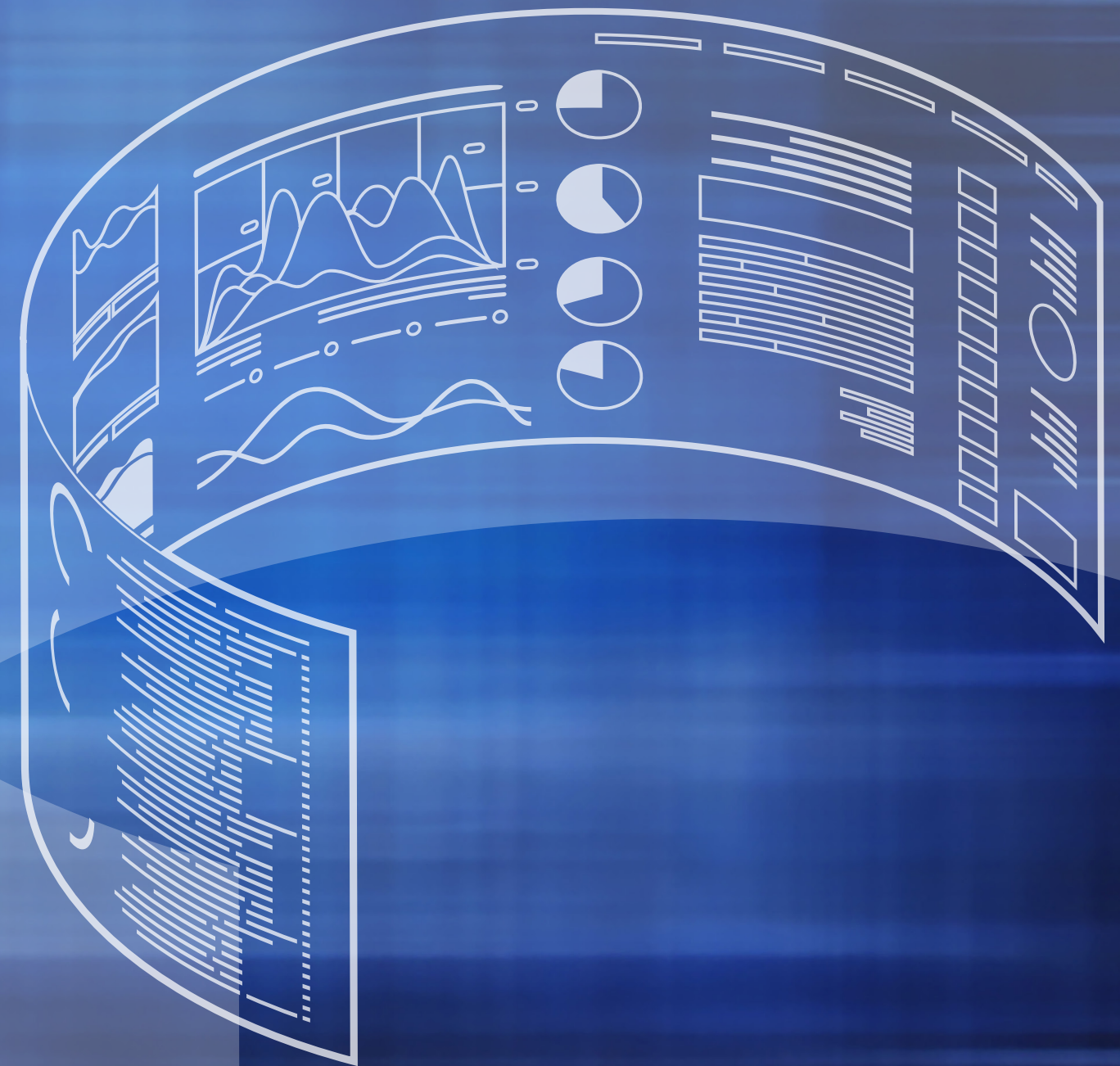
A campaign for The SPARK Center at DePaul University™



The SPARK Vision

To create a state-of-the-art public gathering space where communities and organizations can better understand the future impacts of their decisions through predictive technology, academic rigor, and inclusive debate.

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A Center for a World in Need

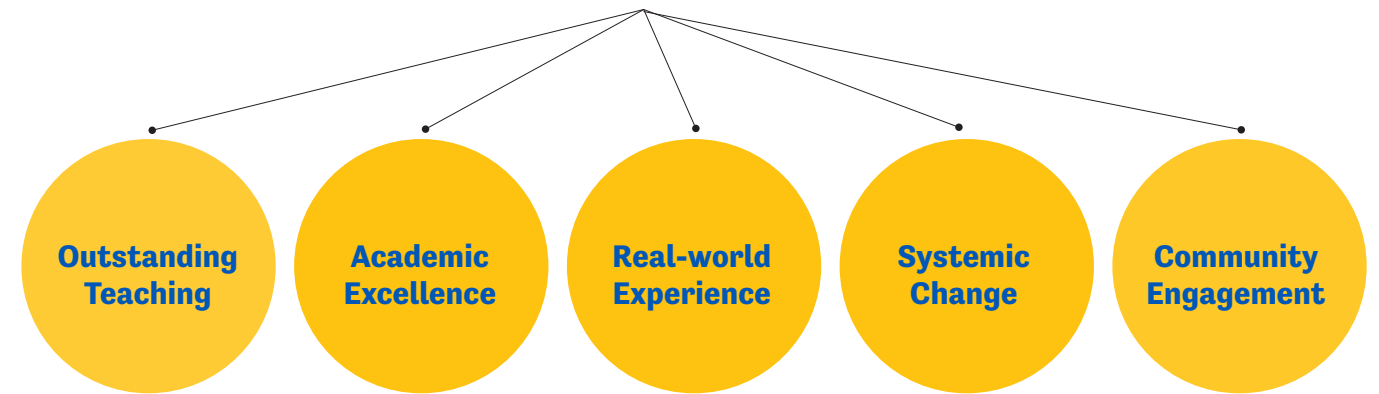
#1 Catholic university in Illinois

Situated in the heart of Chicago, DePaul University is a premier research and teaching institution. As a Catholic university in the Vincentian tradition, DePaul University is motivated by the examples of Vincent de Paul and Louise de Marillac, who led their contemporaries to serve urgent human needs.

As a result, DePaul is committed to addressing the great questions of our day and promoting peaceful, just, and equitable solutions to social and environmental change through education, research, and community engagement.



Our Values



DePaul and its mission lend themselves to the development of technologies that benefit society—not just generating profits for companies or doing technology transfer for the sake of technology transfer, but focusing on the betterment of the world and its people.” — **Bamshad Mobasher, professor of artificial intelligence, data analysis, and information retrieval**

Our mission is to prepare students to succeed and make a difference in a changing world. But today, in Chicago and across the globe, we face major challenges that test our current processes for problem-solving and decision-making. Adequately preparing students to solve these challenges in the future—and ensuring our current decision-makers succeed in the present day—requires a new approach.

Three challenges in particular — **poverty and inequality**, **sustainability**, and **artificial intelligence** — urgently demand our attention. These issues intersect with DePaul’s mission and unique capacity, inspiring us to advance solutions for each one.



Poverty and Inequality

SUPPORTING OUR NEIGHBORS

For decades, the U.S. government has attempted to eradicate poverty and inequality with meager progress. Between 1980 and 2018, the federal government raised spending on antipoverty programs from \$630 per person to \$1,448 per person—a 130 percent increase.¹ And yet, over the last four decades, the national poverty rate has fallen by only 1.2 percent.^{2,3} Today, 11.6 percent of Americans and 17 percent of Chicagoans can’t afford basic necessities like food, healthcare, and housing.^{4,5}



Sustainability

PROMOTING PEACE AND PROSPERITY

In 2015, the United Nations shared 17 Sustainable Development Goals with the intention of creating a roadmap to peace and prosperity for people and the planet. The goals, which span the economic, social, and environmental dimensions of sustainability, gave member states a clear mandate for progress by 2030, but they have been imperiled by a number of crises like the pandemic and the war in Ukraine. Achieving the UN’s vision will require much swifter and more sweeping action.



Artificial Intelligence

SPURRING ETHICAL CHOICES

AI will undoubtedly transform the way we work and learn by automating repetitive tasks, reducing human error, and helping us make faster, more informed decisions. But a number of adverse side effects are sure to accompany these benefits. For one, AI is susceptible to imperfect data and the inherent bias of its human programmers.¹⁰ Unless we deploy this technology carefully and painstakingly, we may find ourselves with irreversible, dire outcomes.

To date, efforts to address each of these issues have failed to kickstart the transformations we sorely need. A revolutionary method of decision-making is necessary to finally make progress on these issues and develop solutions that involve the people most affected by them.

A Center for Evolved Decision-Making

Why do these problems persist in spite of the resources we've dedicated to solving them? Our society's current method for solving large-scale problems is flawed for three reasons:

1 Decision-makers look backward.

Decision-makers tend to examine past data, make inferences, and then choose an appropriate course of action based on those inferences. Only after a decision and years, or sometimes decades, have passed can they look back and understand the outcome.

2 Bias seeps in.

In many cases, recent attempts to understand poverty and inequality, climate change, and artificial intelligence haven't come from neutral, comprehensive, and interdisciplinary teams of academics, community members, and decision-makers but rather siloed researchers and entities seeking support for pre-determined stances. As a result, the work is often compromised by unintended bias and overlooked variables.

3 Present-day argumentation is flawed.

In society at large, meaningful and rigorous debate is rare and difficult to facilitate. The rise of social media has escalated a problem kindled by television news networks: the loudest voice receives the biggest megaphone. Americans are increasingly wary of their neighbors on the opposite side of the political spectrum and more skeptical of authority. True debate, once rooted in empiricism, is near extinct.

Higher education is one organizational entity that can convene disparate voices on important issues and revive thoughtful, civil debate in our country. It also has the capacity to



reliably harness emerging technology and channel it for the greater good without interference from competing motives. This is the driving belief behind **The SPARK Center at DePaul University™**—a vision for a forum and physical place for addressing the most pressing problems of our time.

What Is

The SPARK Center at DePaul University?

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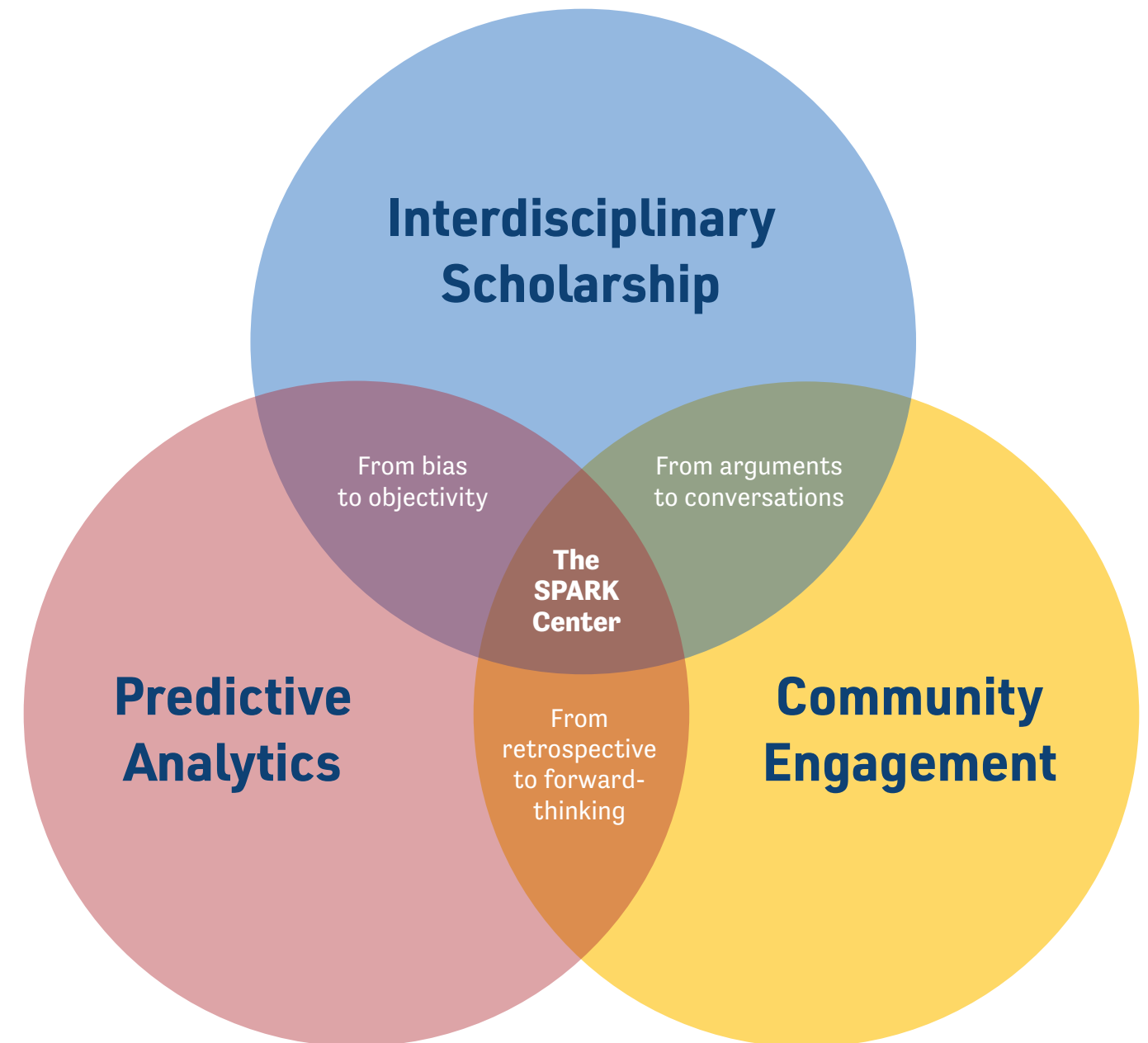
Located on the Loop Campus, The Strategic Partnerships for the Advancement of Research and Knowledge (SPARK) Center will convene constituents from inside and outside the university who share an interest in solving a contemporary problem, or achieving a breakthrough outcome in poverty and inequality,

sustainability, or artificial intelligence.

The SPARK Center is where **the community will have the opportunity to connect with faculty across all disciplines and collaborate to solve the pressing needs of our day.** Beyond simply connecting the community to the collective wisdom of our interdisciplinary

faculty, **the center's data science and AI teams will be able to model and visualize the history of the problem as well as multiple predicted scenarios for the future.** Capability like this has a far-reaching impact on the community and the creation of solutions that benefit our local, national, and global communities.

The Transformation



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How Will The SPARK Center Work?

Through a multi-dimensional experience in an immersive, data-rich environment, The SPARK Center will empower stakeholders to empirically understand impact, model future states, and then have informed debate. By leading with the community question, SPARK puts people at the heart of its approach:

Step 1: Question. A leading stakeholder collaborates with either the university's Center on Poverty and Inequality, Sustainability Institute, or Artificial Intelligence Institute to present a question to The SPARK Center.

Step 2: Design and model. DePaul faculty across schools and disciplines—together with the community partners gathered—work to flesh out the questions, design the parameters of the study, gather exhaustive data on the topic, and create the model to peer into the future.

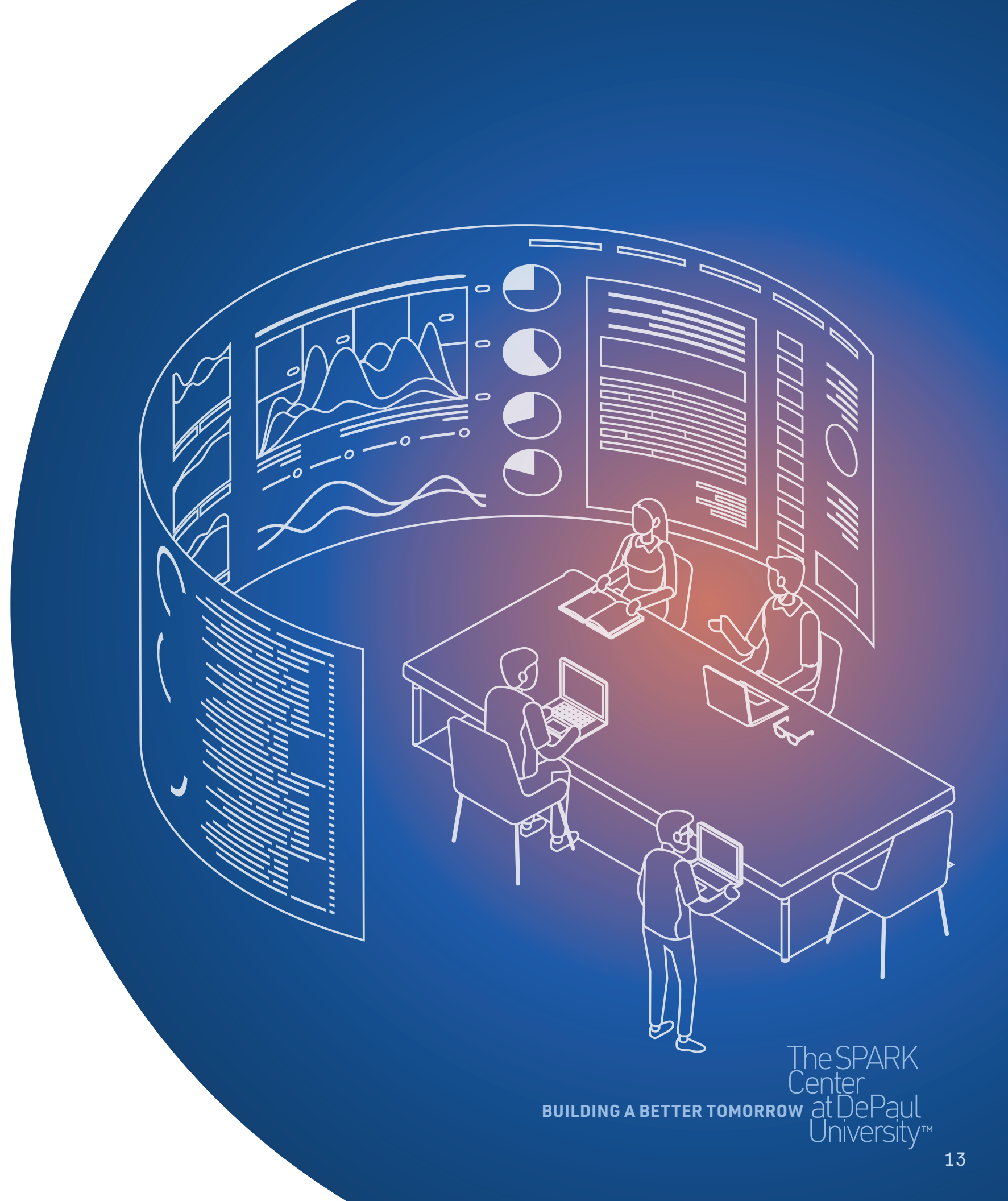
Step 3: Discuss and debate. Finally, researchers, stakeholders, students, staff, and community members gather in The SPARK Center. A team leader presents interactive data visualizations on a large screen that engages the audience in the data story. The goal is to facilitate discussion,

eventually arriving at an actionable conclusion to the original question.

Putting the community voice front and center

This transformation would remove potential biases from decision-making, facilitate understanding across communities, and produce desirable outcomes for participants, community members, and society at large.

For example, if a nonprofit board of trustees is deciding where to build a new charter school, it has to figure out how potential locations will affect not just long-term outcomes for the individual students attending the school but also issues across the community, including homelessness and incarceration. At the SPARK Center, the nonprofit board could hear from community members on which issues they value most, see potential outcomes for each location, and choose the best one accordingly.



A Center for Predictive Analytics

As a society, we now have the technology to empower decision-makers with an understanding of the likely outcomes of a course of action before they make a choice. Once predictive analytic technology is paired with academic and community expertise, the results will be extraordinary. Globally recognized as a resource for technological study and advancement, DePaul University is uniquely positioned to lead this endeavor.

The Jarvis College of Computing and Digital Media at DePaul is one of the largest and most comprehensive computer science and digital media programs in the nation.

Jarvis College of Computing and Digital Media (CDM) Awards

- #1 Game design school in the Midwest
- #2 Animation Bachelor of Arts degree program in the U.S.
- #1 Visual effects school in the Midwest
- #3 Cybersecurity master's degree program in the U.S.
- #5 Computer science school in Illinois
- #3 UX/UI/HCI undergraduate school in the U.S.*
- #5 UX/UI/HCI graduate school in the Midwest

*Among private schools and colleges



The Jarvis College of Computing and Digital Media is home to:

DePaul Center for Data Science: an interdisciplinary research center that brings together the expertise of DePaul faculty in data science, machine learning, and AI, as well as academics and industry practitioners through research colloquiums, workshops, and collaborative projects.

Jarvis Student Center for Innovation and Collaboration: a collaborative space where students and faculty partner with industry to apply emerging technologies toward social needs.

Center for Web Intelligence: a research group focused on the development of intelligent techniques and applications for the World Wide Web, including automatic web personalization, recommender systems, e-business intelligence, web usage and content mining, and intelligent web agents for information filtering.

Technology for Social Good: a lab that designs, builds, and studies tools with the goal of fostering equitable education and empowerment in urban communities.

invest in a private cloud server when building SPARK to maximize data security and processing power.

Right now, we work with organizations and use their data sets, but collaboration doesn't happen in a single room. SPARK will open an avenue to put people together to talk, share data, and reach consensus more effectively.” —

Daniela S. Raicu, director of the Data Mining and Predictive Analytics Center at DePaul University

The accomplished computing and data science faculty at Jarvis will be integral to the success of SPARK. In addition to leveraging existing technologies at the College, the University plans to

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A Center for Interdisciplinary Scholarship

SPARK will enable us to get together and answer a given question in a truly interdisciplinary way. We're talking about bringing more than 50 disciplines together. That alone is a good educational experience." — **Robert Manuel, president of DePaul University**

30+
Undergraduate
Majors

30+
Graduate
Programs &
Certificates

A multitude of interdisciplinary, data-driven projects are already underway across DePaul's schools and centers, making SPARK a natural extension of the University's work. Faculty members and students with an array of research specialties are collaborating with partners, both within and beyond the institution, to craft predictive models that improve decision-making processes.

Examples of these initiatives include:

Social computing: Researchers are developing a tool that analyzes language patterns within social media posts to proactively identify and intervene in potential suicide attempts.

Environmental justice: With a \$250,000 grant from NASA, two DePaul faculty members are enhancing an online dashboard that uses satellite data to spotlight disparities in tree canopy coverage, plant diversity, and air quality across various neighborhoods in Chicago.

Climate change: In collaboration with the Argonne National Laboratory, DePaul students are studying the activity of commercial trucks and buses to predict energy implications.

Public safety: Faculty are creating predictive models to reduce the risk of auto accidents at crash-prone locations.

Healthcare: Researchers are discovering applications for AI in medicine and healthcare, including an advanced image search engine for radiologists and a method for classifying gait activities through machine learning, wearable sensors, and GPS.



Finding applications for AI in medicine and healthcare



Studying commercial vehicles to predict energy implications



Enhancing environmental justice



Reducing the risks of accidents at crash-prone sites



Intervening in potential suicide attempts

Top ranking academic programs, distinguished faculty, and award-winning work are characteristic of DePaul's colleges of Business, Communication, Continuing and Professional Studies, Education, Law, Liberal Arts & Social Sciences, Music, Theater, and Science & Health. By tapping into the expertise at each of these leading institutions, SPARK will enable comprehensive understanding of key questions.

A Center for Community Collaboration

125,500+
alumni in
the metro area



Strong local connections will be vital to the success of SPARK—and DePaul’s students, faculty, staff, and alumni are deeply embedded in the Chicago community.

Moreover, DePaul students are determined to make a difference in their communities and the world. The University fosters this sense of personal responsibility through the Irwin W. Steans Center, which provides opportunities for students to meaningfully engage with the community while furthering their education. Through its Asset-Based Community Development (ABCD) model, the school recognizes and values the wisdom, experience and local knowledge that community partners bring—and seeks to facilitate processes where these partners are given voice. The University’s diverse undergraduate population—one in three of whom are first-generation college students—also contribute important perspectives that inform our practices around systemic change.

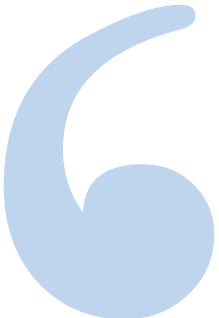
Every year:
3,800+ students complete service-learning courses
The student body volunteers 125,000 hours of community service
The Steans Center supports 200+ community partners

Community engagement opportunities include:
Direct Service
Project-based Service
Community-based Research
Advocacy and Solidarity

Meanwhile, faculty frequently partner with stakeholders across Chicago—including government officials, corporations, and community leaders—to enable data-driven decisions.



At the time of the Covid pandemic, many faculty members were already collaborating with the city of Chicago. They were approached by the city to predict the race and ethnicity of people with the greatest need for Covid-19 testing—and, later, vaccines—through data analysis.



DePaul excels at engaged scholarship, or the dissemination of knowledge to bridge the gap between academia and practice to have a larger impact on society as a whole. Our close relationship with industry affords us a significant advantage—we know what problems our community faces.” —
Jennifer Tartara, assistant professor of marketing at the DePaul University Driehaus College of Business

A Center for a Better Tomorrow

At The SPARK Center, complex challenges will find real-world solutions. The combination of predictive modeling and interdisciplinary collaboration between educators, students, and the community will result in a myriad of benefits for all participants and society at large.

Students

- Receive interdisciplinary research opportunities
- Connect with problems they want to solve in the world
- Enter society with a better understanding of how to apply theoretical knowledge

Faculty

- Receive more opportunities to collaborate with colleagues
- Produce and elevate interdisciplinary research
- Live the Vincentian mission of helping others

Partners

- Lead the process with their questions and concerns
- Gain data-driven insights into complex problems
- Improve chances for positive and direct impact
- Use resources more efficiently

Community members

- Shape the decision-making behind local policies and initiatives
- Participate in diverse, nonpartisan dialogue

Higher education

- Becomes a good for all of society, rather than just the individual



Ultimately, the SPARK Center is just a means — a place where you can share information more effectively, bring communities together, and help people think about the data — and ask the right questions — before you come up with a solution.” —

Raffaella Settimi, associate dean at the DePaul University College of Computing and Digital Media

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Change Requires Action

Only through your participation will The SPARK Center power smarter choices – and a better world.
Here are a few ways you can do your part:

Ask a question: Are you a leader, corporation, non-profit, researcher, or community group with a question you'd like to answer with predictive data and interdisciplinary discourse? Bring us your challenges—especially if they relate to poverty, sustainability, and artificial intelligence.

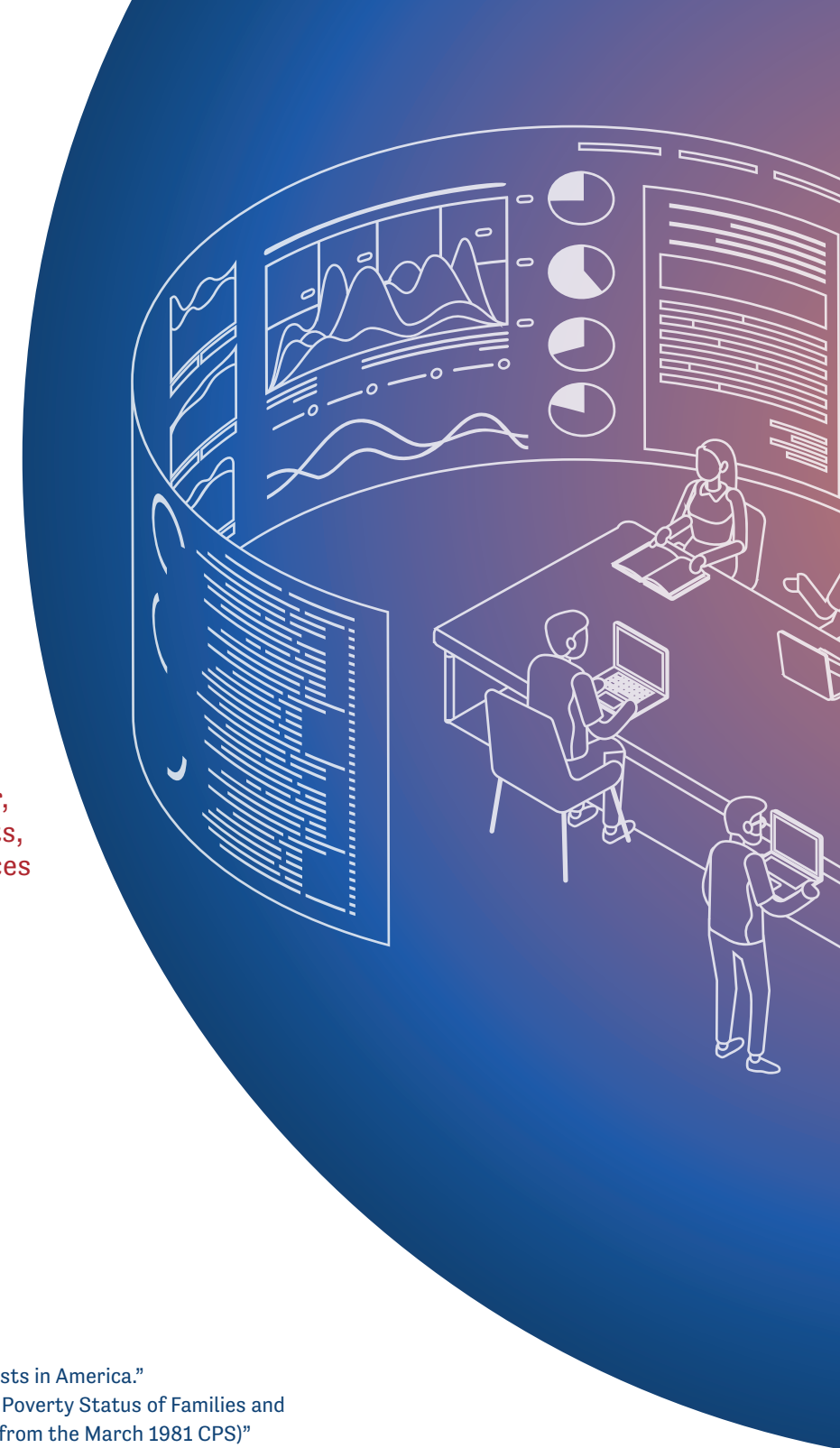
Lend your expertise: Are you an academic, data scientist, or researcher interested in lending your expertise or resources to the development of SPARK? We want to hear from you. Our aim is to bring together as many diverse voices and perspectives as possible.

Become a member: As a SPARK member, you'll gain a number of exclusive benefits, including preferential access to resources and faculty. Enjoy the opportunity to fast track your projects and make an impact on an expedited timeline.

Get Involved.

For more information, visit go.depaul.edu/spark or reach out to The SPARK Center director, LeAnne Wagner, at leanne.wagner@depaul.edu.

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2. United States Census Bureau: "Money Income and Poverty Status of Families and Persons in the United States: 1980 (Advance Data from the March 1981 CPS)"
3. U.S. Bureau of Labor Statistics: "A profile of the working poor, 2018."
4. United States Census Bureau: "National Poverty in America Awareness Month: January 2023."
5. United States Census Bureau: "QuickFacts: Chicago city, Illinois."
6. McKinsey Sustainability: "How Big Business Is Taking the Lead on Climate Change."
7. Annual Review of Environment and Resources: "Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve?"
8. Sustainability at Georgetown University: "50 Facts for 50 Years."
9. Climate Central: "Average Winter Temperature: Chicago."
10. The New York Times: "When AI Chatbots Hallucinate."



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