

# ANALYTICS AT WHARTON

*Funding Opportunities*



Wharton  
UNIVERSITY of PENNSYLVANIA

Inspire.  
Achieve.  
Scale.



# Analytics at Wharton synchronizes the School's big data vision to reinvent decision-making.

The scope of analytics in business is quickly expanding: big data now cuts across disciplines, industries, and economies. With the formation of Analytics at Wharton (AAW), the School has committed to grow its analytics research, curriculum, and in-the-field engagement. Led by Vice Dean of Analytics, K.P. Chao Professor and Professor of Marketing, Economics, Education, and Statistics, and Marketing Department Chair Eric T. Bradlow, Analytics at Wharton unites the School's trail-blazing analytics programs to create the next generation of business leaders who use data and real-world experiences to improve decision-making.

**United under one strategic vision, Wharton's data-driven programs can coordinate across verticals and expand analytics practice across disciplines.**

**ARTIFICIAL INTELLIGENCE  
FOR BUSINESS**

**CUSTOMER ANALYTICS**

**PENN WHARTON BUDGET MODEL**

**PEOPLE ANALYTICS**

**WHARTON NEUROSCIENCE**

**WHARTON RESEARCH  
DATA SERVICES (WRDS)**

**SPORTS ANALYTICS AND  
BUSINESS INITIATIVE**

The worlds of business, policy, and the public need rigorous data analysis to inform decision-making. The programs that form Analytics at Wharton address different themes, and their core value unites them: to responsibly use data to benefit global business and society. Each program engages with diverse audiences including policymakers, academic researchers, startups, corporations, nonprofits, and students and alumni to do just that.



“At Wharton, our teaching and research define the cutting edge in using data analysis to inform decision-making. Our students and faculty are applying these methods in real time to real problems, meeting the growing needs of organizations seeking talented people who can turn raw data into actionable business intelligence.”

ERIC T. BRADLOW



## GOALS



Enhance the work and recognition of the seven programs under the AAW umbrella



Elevate Wharton's leading reputation in the area of predictive analytics



Prepare students to take leadership roles translating analytics into actionable business insights

**Analytics at Wharton enables the School to increase activities and resources in analytics — a major area of strength, potential, and opportunity for Wharton.**

**Key strategic priorities include:**

- ➔ Provide operational support that enables faculty to focus on their greatest strength — academic thought leadership — and allows for an overall greater impact on their work.
- ➔ Expand experiential learning opportunities and engagement in new areas including health care, network science, nonprofits, and government agencies.
- ➔ Incubate new ventures that support cutting-edge research and education in diverse industries and academic fields.
- ➔ Leverage big data and analytics to empower underrepresented communities to ensure long-term growth and prosperity and ensure all students, regardless of their background or gender, have access to skills to pursue careers in the field.

**“ANALYTICS AT WHARTON PROVIDES STUDENTS WITH UNIQUE OPPORTUNITIES TO LEARN ANALYTICS AND DATA SCIENCE SKILLS FIRSTHAND AND PREPARE US TO BE BETTER BUSINESS LEADERS AND CHANGE-MAKERS.”**

ANDREW CASTLE, W'21

*Wharton Analytics Fellow*



# Wharton's outstanding reputation for analytics creates high demand for courses and co-curricular activities.

The growth in analytics among Wharton's research centers influenced the development of two new areas of study: an undergraduate concentration and an MBA major in business analytics. Led by faculty advisors Sergei Savin, Associate Professor of Operations, Information and Decisions, and Richard Waterman, Practice Professor of Statistics, these programs equip students with the tools to collect, manage, and describe datasets; form inferences and predictions from data; and make optimal and robust decisions.

## Wharton is at the forefront of preparing students for careers of the future.

### **Analytics-based courses**

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» **65**

### **Associated faculty members**

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» **46**

### **MBAs majoring in business analytics**

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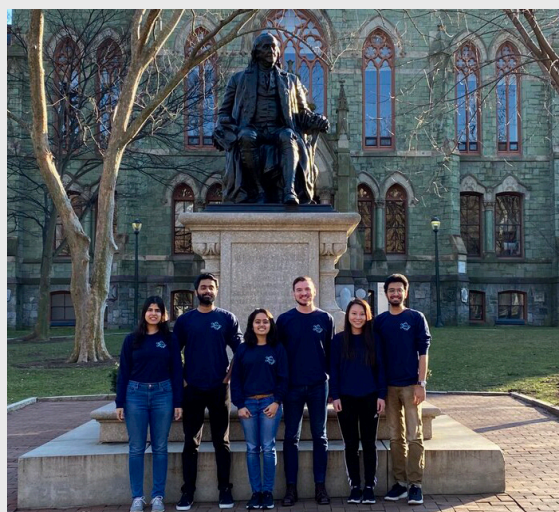
» **26**

### **Conferences and public events held annually**

» **18**

The number of analytics-related clubs across Wharton has significantly increased due to a high demand for opportunities to connect students to real-world data and business problems. In the past year, over 400 students applied to work on analytics projects coordinated by Wharton Analytics Fellows, a club that unites Wharton MBAs, undergraduates, and faculty members to use analytics to solve complex business challenges.

In addition, since Wharton Undergraduate Data and Analytics Club's inception in fall 2017, it has seen a 128% growth rate among undergraduate students, further demonstrating the interest and high demand from students to cultivate relationships with faculty, research centers, alumni, and industry working in analytics. There are three clubs that work with research centers to source projects, secure student talent, and partner with companies to uncover, test, and scale analytical insights across multiple industries.



*Members of the Penn Data Science Group published their first paper. It was accepted for the Data Science for Social Good workshop at the Web Conference 2020.*

# THE FUTURE OF ANALYTICS AT WHARTON

Analytics at Wharton invests in new and innovative ideas that enhance Wharton's brand, power insights, and reinvent decision-making. AAW supports novel opportunities to expand the impact of "big data" analytics on areas as diverse as sports and entertainment, health care and medicine, data privacy and corporate governance, and network science and the media.

## **Analytics at Wharton will enhance established activities to better serve constituents. Activities with the highest priority include:**

### ➔ *Annually Funded Projects*

Each year, AAW allocates over \$500,000 to seed fund new ideas that expand the impact of data and analytics at Wharton. Faculty submit proposals and selected projects utilize the infrastructure of AAW to promote, disseminate, and leverage their research. With current funding, AAW funded 16 out of 40 proposals during the 2019-20 school year. Additional funding will increase financial support for more projects — including faculty-mentored student research projects.

### ➔ *Experiential Learning*

Analytics at Wharton coordinates opportunities for students to work with Customer Analytics, People Analytics, Sports Analytics and Business Initiative, and student clubs. Additional funding for experiential learning will support the expansion of these opportunities and the flexibility to explore innovative content and engagement in new areas.

## RECENT PROJECTS FUNDED BY ANALYTICS AT WHARTON

### **Better Big Data to Prevent Burnout and Improve Teams**

This project equips medical providers with individually worn biometric sensors that closely track the workplace demands and stresses they experience while navigating swings in high acuity patients' urgent needs.

### **Effective Text Processing in New Domains: Transfer Learning for Word Embeddings**

Research seeks how to increase the applicability of text analytics algorithms by transferring word embeddings for large-scale data to domains with small- and medium-scale datasets.

### **Amenity Value of Green Space**

Research project to identify the benefits of transforming blighted and vacant lots into maintained green open space by deploying spatial techniques and integrating multiple data sources to improve the understanding of the dynamics of urban change and identify how residents value "greener" neighborhoods.

### **Analysis of Digital Experimentation in Industry**

Original academic research conducted to better understand how real-world firms use A/B testing software and how consumers respond to online experiments.

**2020-2021  
SUBMISSIONS**

Proposals  
**22**

Projects Selected  
**18**

Funds Awarded  
**\$400,000+**

## Analytics at Wharton pilots new programs and initiatives to meet the demand of analytics education and research. Examples of new programs include:

### ➔ *Wharton Data Analytics Applications*

AAW has partnered with Wharton Interactive to develop business analytics and technical case studies to teach data science and analytics in classrooms around the world. Wharton Interactive is a digital platform that provides experiential learning through a realistic, virtual experience. The first Wharton Data Analytics Application is in partnership with Wharton Customer Analytics using data from Evite.

### ➔ *Analytics for Good*

Big data and analytics can be used in meaningful ways to solve society's most complex problems. AAW seeks to use this knowledge to uplift and empower underrepresented communities to ensure long-term growth and prosperity. Analytics at Wharton is committed to democratizing access to data science and analytics education to ensure all students, regardless of their background, have access to these skills. Analytics at Wharton is exploring ways to work with nonprofits and government agencies to facilitate analytics projects that address injustice.

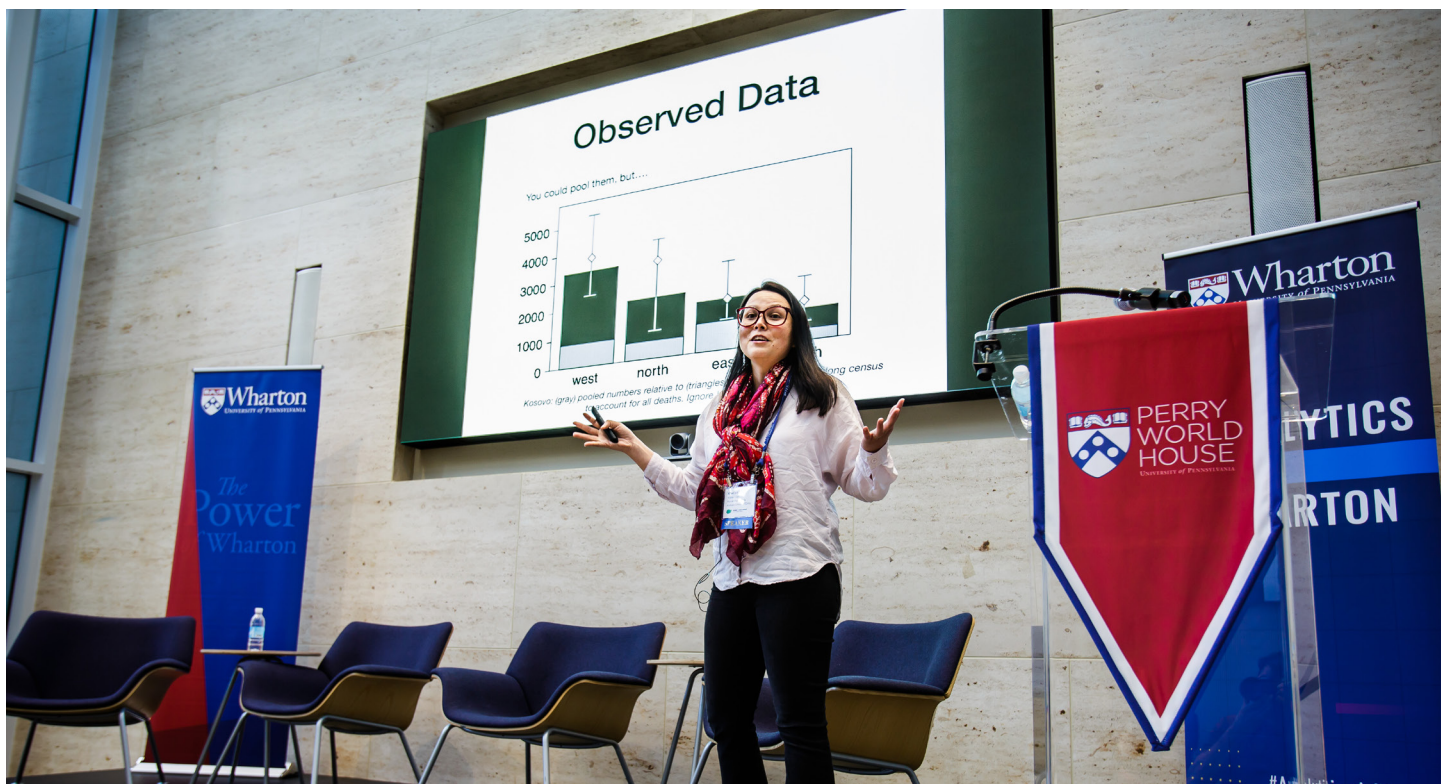
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**“Data analytics is the engine that powers finance. With the support of Analytics at Wharton, I have been able to create a novel and entirely different type of finance course — Data Science for Finance — that will empower our students with cutting-edge financial decision-making skills.”**

#### **MICHAEL ROBERTS**

*William H. Lawrence Professor of Finance*

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*Kristian Lum, Lead Statistician of Human Rights Data Analysis Group, presents at the WiDS Conference at Penn.*

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## **Analytics at Wharton will expand programming for students and alumni, further strengthening Wharton's analytics brand. Programs and activities that will benefit from growth opportunities include:**

### **➔ *Women in Data Science Conference at Penn***

In February 2020, Analytics at Wharton hosted the first annual Women in Data Science Conference held at Penn. The conference, open to all Penn students, inspires and educates data scientists, regardless of gender, and supports women in analytics and data science-related careers. This event is part of the larger Women in Data Science (WiDS) initiative originated at Stanford in 2015 that includes a global conference, more than 150 regional events, a datathon, and numerous podcasts.

### **➔ *Increased Synergies among Programs***

Analytics at Wharton seeks to create shared data and administrative services to create more efficiencies, cultivate cross-team collaboration, and support the work of current and future analytics entities.

### **➔ *Analytics at Wharton Labs***

Analytics at Wharton is committed to incubating new ventures that support cutting-edge research and education in diverse industries and academic fields. Seed funding was provided to the Analytics at Wharton Labs, but long-term funding is needed to sustain these programs and create a lasting impact. *See below for details about each lab.*

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## **ANALYTICS AT WHARTON LABS**

### **Computational Social Science for Business Lab**

The Computational Social Science for Business Lab highlights the research of Penn Integrates Knowledge (PIK) Professor Duncan Watts and Assistant Professor of Operations, Information and Decisions Dean Knox.

Professor Watts' research uses applied methods from computational social science and network science to design, build, and test scalable collaboration systems and technologies, and ultimately, advance the fundamental understanding of industry processes.

Professor Knox's research supports the development of statistical and artificial-intelligence methods to provide policy evaluation and public education to improve the literacy of policymakers, practitioners, and the general public on societal issues.

### **Wharton Energy Analytics Lab**

Led by Edgar Dobriban, Assistant Professor of Statistics, Eric J. Tchetgen Tchetgen, Luddy Family President's Distinguished Professor, and Steven O. Kimbrough, Professor of Operations, Information and Decisions, the Wharton Energy Analytics Lab brings to bear cutting-edge applications of machine learning techniques to position Wharton as an undisputed leader in connecting data analytics and energy markets to face societal challenges.

### **Environmental, Social, and Governance Analytics Lab (ESGA-Lab)**

Under the leadership of Witold Henisz, Deloitte & Touche Professor of Management in Honor of Russell E. Palmer, former Managing Partner, the ESGA-Lab analyzes the materiality of businesses' environmental, social, and governance risks and opportunities and promotes faculty research, teaching, and student learning in this area.

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# FUNDING OPPORTUNITIES

AAW seeks funding partners to support and enhance current programming and to pilot new programs that will reach broader audiences and further support analytics research and education. A term or endowed gift of up to \$1,000,000 provides sustaining support for AAW. You can designate your gift to the Data Science and Business Analytics fund directly or support one or more of the following funding priorities:

- ➔ **Analytics for Good**
- ➔ **Analytics at Wharton Labs**
- ➔ **Annually Funded Projects**
- ➔ **Experiential Learning**
- ➔ **Wharton Data Analytics Applications**

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## **Endowing a specific program within AAW provides a steady source of funding, ensuring generations of students have access to these tremendous opportunities.**

Endowed gifts for AAW are \$2,000,000 or greater. Areas that would benefit from this highest level of support include:

- ➔ **Analytics at Wharton Faculty Fellows**
- ➔ **Analytics at Wharton Labs**
- ➔ **Experiential Learning Programs: Analytics Accelerators, Datathons, Treks, or WSABI Summer Programs**
- ➔ **Specific Programs: Customer Analytics, People Analytics, PWBM, Wharton Neuroscience, WSABI**

*To learn more about supporting Analytics at Wharton, please contact Wharton External Affairs: +1.215.898.8479 or [external.affairs@wharton.upenn.edu](mailto:external.affairs@wharton.upenn.edu)*

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# OVERVIEW OF PROGRAMS

## Customer Analytics (WCA)

### OVERVIEW

WCA is a leading academic research center focused on the development and application of marketing analytics methods. WCA works with companies and organizations to form a dynamic educational ecosystem that encourages students to apply new data analytics methods to current business challenges. Combining unique company and third-party industrial data sets, students and researchers test hypotheses and translate their findings into knowledge companies can put into action. WCA leverages experiential learning programs to transform the educational landscape around descriptive, predictive, and prescriptive analytics.

### IN PRACTICE

To be the leaders of the future, Wharton students need to learn not only how companies harness data, but the valuation of the data with regard to customers, brands, and future growth. The Analytics Accelerator Program is an immersive learning experience that does just that. In 2020, students worked for seven intensive weeks with real datasets from companies in the entertainment, technology, retail grocery, and mental health sectors to develop actionable insight and demonstrate modeling and statistical analysis skills as well as business acumen and client services skills.

## Wharton Neuroscience (WiN)

### OVERVIEW

Up-to-the-minute breakthroughs in neuroscience help business leaders understand more accurately what holds people's attention and what motivates them. Led by Penn Integrates Knowledge Professor Michael Platt, Wharton Neuroscience works at the nexus of business and neuroscience to reframe how organizations do almost everything, from marketing to management. The interdisciplinary WiN community produces research, technology, and applications that lead to best practices in five mission-critical areas: business decision-making, brand strategy and customer experience, talent assessment, team dynamics, and communication.

### IN PRACTICE

Organizations rely on the success of team-based projects. A number of WiN projects focus on group dynamics and team chemistry. In one current study, WiN is testing the role of physiological synchrony in group communication and decision-making by measuring neurometrics (EEG brainwave activity) and biometrics (e.g., heart rate, respiration rate, and facial action coding). Results suggest that compared to groups that do not reach a consensus or arrive at a wrong answer to the problem, groups that reach the correct consensus share unique information faster and exhibit greater biometric synchrony.



*Michael Platt, James S. Riepe University Professor and Wharton Neuroscience Initiative Faculty Director, wears eye-tracking glasses and a wireless electroencephalogram (EEG) among the food trucks on campus.*

*Photo Credit: Kevin Monko*

# Analytics at Wharton Creates Insights for Decision-Making and Shapes Business Strategies across Industries.



## People Analytics

### OVERVIEW

People Analytics pursues the four interconnected areas of research, practical application, education, and community building to help individuals and organizations thrive using evidence-based decision making. WPA is focused on three primary research streams warranting deep and ongoing research: Careers, Culture, and Character. Through carefully designed experiments, new assessments, and analyses of existing data sources, the WPA team focuses on delivering novel insights that have the potential for big impact.

### IN PRACTICE

WPA partnered with the McNulty Leadership Program to develop and administer scientifically grounded assessments linked to personalized learning and experiential programs for MBA students. In a structured process, students use insights from assessments to set goals one-on-one with a renowned executive coach. Students participate in leadership development activities, and then retake the battery of tests to obtain precise growth metrics and set new goals with their coach.

## Sports Analytics and Business Initiative (WSABI)

### OVERVIEW

WSABI broadens Wharton's focus in teaching, research, and community engagement initiatives that use datasets to improve decision-making in the areas of player recruitment, player performance, esports, fan engagement, and the stadium experience. WSABI engages with students, alumni, and industry leaders through a range of programming, including student-led conferences, high school academies, and research seminars that advance analytical thinking, all through the lens of sports. Industry partnerships with WSABI generate internship and job opportunities for students in a rapidly growing, highly competitive field.

### IN PRACTICE

Under Adi Wyner's leadership, WSABI is pioneering sports analytics education. Moneyball academies for high school students, along with undergraduate education and MBA research, pave the way for industry leadership. The Penn Sports Research Group and graduate sports analytics seminar conduct hands-on research and projects that stem from industry partnerships. Student groups have competed in the NFL Data Bowl, worked with college sports data, and landed highly competitive jobs at teams in the NBA, MLB, NHL, and NFL.

# Penn Wharton Budget Model (PWBM)

## OVERVIEW

The nonpartisan Penn Wharton Budget Model provides accurate, accessible, and transparent economic analysis of public policy's fiscal impact in areas including health care, immigration, Social Security, tax reform, and public investment. PWBM uses its cloud-based simulators and briefs to respond in real time to policy debates on Capitol Hill, providing data on economic, distributional, and budgetary effects of legislation. Policymakers, presidential candidates, journalists, academics, and the public rely on the precision and speed of PWBM's advanced data modeling before making decisions.

## IN PRACTICE

Launched in 2019, the Wall Street Journal Tax Calculator, powered by PWBM, helps taxpayers understand the impact of changes in tax law as they prepare their taxes. Taxpayers only need to enter a few key characteristics such as income and marital status into the online calculator to get an estimate of their tax liability from 2018 to 2027. The calculator has been used more than 1,000,000 times.

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# Wharton Research and Data Services (WRDS)

## OVERVIEW

WRDS provides the leading business intelligence, data analytics, and research platform to global institutions — enabling comprehensive thought leadership, historical analysis, and insight into the latest innovations in academic research. Partnering with global vendors, WRDS hosts 350+TB of data on the most robust computing infrastructure to give users the power to analyze complex information. Supporting 75,000+ commercial, academic, and government users at 500+ institutions in 35+ countries, WRDS is the global gold standard in data management, analytics tools, and research services.

## IN PRACTICE

WRDS's comprehensive data and user-friendly materials inspire hands-on learning opportunities for students. "Seamless access to Wharton's financial datasets has been a key component of my curriculum development. WRDS has influenced my lecture style, which now combines a formal lecture with a directed recitation. This teaching technique allows the students to see the data unfold in real time," said Dr. Michael Phelan, Associate Professor of Statistics at Wharton.

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# Artificial Intelligence for Business: AAW's Newest Initiative

## OVERVIEW

AI for Business launched in May 2020 and was made possible by a \$5 million gift from Tao Zhang, WG'02 and his wife Selina Chin, WG'02. Led by AI expert Kartik Hosanagar, John C. Hower Professor of Operations, Information and Decisions, AI for Business explores applications and impact of artificial intelligence and machine learning across industries, inspires innovative teaching and research, and engages global business leaders to set a course for better understanding of this nascent discipline.

**"Our students and professors are energized by the idea that AI is influencing nearly every aspect of humanity and our efforts to understand it can make a difference for years to come. The future of machine learning is happening now — there are unlimited entry points for experiential learning to explore the topic."**

### KARTIK HOSANAGAR

*John C. Hower Professor of Operations, Information and Decisions*

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