Video Segment 1: Making a Social Impact with Analytics: The Research

"I'm generally pretty passionate about using machine learning and AI techniques for social good." -Dr. Hamsa Bastani

NOTE-TAKING GUIDE

An important first step of any educational exploration is to understand who is leading you on the journey and why. As you begin to explore the *Using Data to Protect and Serve* videos with Wharton Global Youth, briefly define these key components (Hint: Use the vocabulary list below!):

The Wharton School:

Beyond Business 2022:

Dr. Erika James:

Dr. Hamsa Bastani:

Dr. Dean Knox:

Dr. Duncan Watts:

Bonus: Global Youth has built previous Explore Business mini-sites around what other themes?

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The Wharton professors featured in this conversation are leveraging the power of data to bring about social change. Jot down some notes about their research interests and work in the following areas. What issues are they seeking to improve?

Penn Media Accountability Project:

Research on Policing Reform and Accountability:

The Deep Web:

Dr. Hamsa Bastani says, "A significant fraction of my research is dedicated to designing novel machine-learning algorithms for small data settings." What are a few details of the machine-learning strategies she is using within a challenging data environment? Use both the vocabulary list and the video to take notes:

Deep Learning and Large Language Models:

Transfer Machine Learning:

Multi-modal Learning Algorithms:

Reflection: Which area of research mentioned in the video clip interests you the most? Human trafficking on the deep web? Policing reform? Truth in media? Another? Why do you connect specifically with this social issue?

THE LANGUAGE OF BUSINESS
(Linked terms are defined in the Wharton Global Youth Video Glossary)

ACLU (American Civil Liberties Union)

Civil Rights

Computer Science

Data

Democracy

Demographics

Media

Media Bias

PhD

Public Health

Social Impact

Statistician

Supply Chain

Sustainability

Academic Research: Research conducted by faculty at a university like Penn that focuses on creating new ideas and perspectives. Academic researchers read all the existing studies and papers examining a specific topic or theory and then see where they can add value with new experimentation and insight.

Adaptive Machine Learning: Building on traditional machine learning to create a more advanced solution to real-time environments with variable data. Adaptive machine learning can "adapt" to rapidly changing datasets.

Algorithm: A procedure used for solving a problem or performing a computation. Each algorithm is programmed as a step-by-step process for performing calculations and data processing.

Analytics@Wharton: An initiative at the Wharton School of the University of Pennsylvania that brings together eight programs at the school – AI for Business, Computational Social Science for Business, Customer Analytics, Penn Wharton Budget Model, People Analytics, Wharton Neuroscience, Wharton Research Data Services, and Wharton Sports Analytics and Business Initiative, to advance the teaching, research and industry engagement that use data to improve decision-making.

Artificial Intelligence or AI: Intelligence demonstrated by machines (computers), rather than humans.

Beyond Business: An ongoing conversation at the Wharton School of the University of Pennsylvania that explores the most complex and pressing issues impacting individuals and organizations across the world. Each year Wharton Global Youth creates Explore Business mini-sites for high school students around different Beyond Business themes.

Bias: Prejudice against or in favor of one thing, person or group compared with another, usually in a way that is unfair.

Bias in Machine Learning: When an algorithm produces results that are systematically prejudiced due to poor assumptions in the machine learning process – perhaps, for instance, the data is imperfect or biased.

Biased Data Views: Views on issues that are driven by data errors that occur when certain elements of a dataset are overweighted or overrepresented.

Computational Social Science Lab: A joint venture between the University of Pennsylvania's School of Engineering and Applied Science, the Annenberg School for Communication and the Wharton School that seeks insights into social problems by applying computational methods to large-scale data.

Data Analytics (or just Analytics): The systematic computational analysis of data or statistics. It is used for the discovery, interpretation, and communication of meaningful patterns in data.

Dataset: A collection of data.

Dean Knox: An assistant professor of operations, information and decisions at the Wharton School of the University of Pennsylvania and co-founder of Research on Policing Reform and Accountability.

Deep Learning: A machine learning technique that teaches computers to do what comes naturally to humans. Deep learning uses Deep Neural Networks (DNNs) to learn levels of representation and abstraction that make sense of data, such as images, sound and text.

Deep Web: The part of the internet, often where drug sales or other illicit activity occurs, that can only be accessed with specialized software, not through a regular search engine. It's also known as the Dark Web.

Digital Data: The electronic representation of information in a format or language that machines can read and understand.

Duncan Watts: A professor of operations, information and decisions at the Wharton School of the University of Pennsylvania and director of the Computational Social Science Lab at Penn, where he runs the Penn Media Accountability Project or PennMAP.

Enforcement Behavior: Practices employed by police officers to enforce the law.

Erika James: Dean of the Wharton School with research interests in crisis leadership, workplace diversity and management strategy.

Global Fishing Watch: A website that provides the world's first global view of commercial fishing activities.

Global Health: The area of study, research and practice that prioritizes improving health and achieving equity in health for people worldwide.

GPS Data: Data gathered from the Global Positioning System (GPS), a network of satellites and other devices used to determine the location of something on earth.

Hamsa Bastani: An assistant professor of operations, information and decisions at the Wharton School of the University of Pennsylvania, who has been analyzing dark web data related to human trafficking to provide new insights into online sex-trafficking recruiting practices and, more broadly, illicit supply chains on online platforms.

Human Trafficking: The use of force, fraud or coercion to get some kind of labor or commercial sex act. Examples include forced labor and sex trafficking.

Large-language Model: An artificial intelligence tool that can read, summarize and translate texts and is considered powerful for processing natural language data quickly and accurately without much human intervention.

Machine Learning: Using and developing computer systems that learn and adapt by using algorithms and statistical models to analyze and understand patterns in data.

Misinformation: Incorrect or misleading information that amounts to getting the facts wrong. It is often compared with disinformation, which is false information that is deliberately intended to deceive.

Multi-modal Learning: Machine learning that aims to build models that can process and relate information from different modalities, such as various data types like image, text, speech and numerical data.

NAACP (National Association for the Advancement of Colored People): An organization that works to disrupt inequality, dismantle racism, and accelerate change in areas like criminal justice, health care and the economy.

Policing Reform: A movement to transform policing culture and practices, eliminate racial bias and profiling in policing, and end police violence against citizens.

Penn Media Accountability Project (PennMAP): An interdisciplinary research project of the Computational Social Science Lab at the University of Pennsylvania dedicated to enhancing media transparency and accountability at the scale of the entire information ecosystem.

Reinforcement Learning: A machine learning training method in which an intelligent agent like a computer program interacts with the environment and learns to act within that context. It can perceive and interpret its environment and learn through trial and error.

Remote-sensing data: Data that is collected from sensors that detect the energy reflected from the Earth. Remote sensing is the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance.

Research on Policing Reform and Accountability: A group of researchers from different academic institutions (including Dean Knox from Wharton) who develop cutting-edge statistical techniques to measure racial bias in policing, evaluate policing policy reforms, and improve the performance of policing organizations.

Satellite Data: Images and earth observation data of the earth's surface and its atmosphere gathered by satellites in Earth's orbit.

Social Scientist: An expert in human society and social relationships, including economics.

Statistics: The practice or science of collecting, analyzing and interpreting numerical data in large quantities.

Stop Data: Information gathered when police officers make stops, often optional, to enforce laws. For example, an officer might detain a person for questioning or to conduct a search. Stop data can be used to assess the existence of racial disparities.

Systemic Violence: Institutional practices or procedures that adversely affect groups or individuals psychologically, mentally, culturally, economically, spiritually, or physically.

TellFinder Alliance: A web platform that connects its users to the data of the deep web, where human trafficking and other crimes take place.

Transfer Learning: A machine learning method that reuses a pre-trained model as the starting point for a model on a similar new task. This sidesteps the need for lots of new data.

The Wharton School: The Wharton School, also referred to as just Wharton, is the business school of the University of Pennsylvania, a private Ivy League university based in Philadelphia, Pennsylvania. Wharton is a world leader in business education and a hub for academic research in all areas of business.

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Revealing Research Exposes Business on the Dark Web