AMERICAN ACADEMY OF ACTUARIES ANNUAL MEETING PUBLIC POLICY FORUM NOVEMBER 5-6 CAPITAL HILTON WASHINGTON, D.C.



Predictive Models and External Data

ANNUAL MEETING PUBLIC POLICY FORUM

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Today's Presenters

- Rich Gibson, moderator
 - Senior Property/Casualty Fellow, American Academy of Actuaries
- Dorothy Andrews
 - Chairperson, Academy Committee on Data Science and Analytics
- Philip Barlow
 - Associate Commissioner, D.C. Department of Insurance, Securities and Banking
- Mike Woods
 - Senior Manager, Allstate



Predictive Models and External Data Mike Woods, MAAA, FCAS, CSPA

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What 'external data' is used today in predictive models?

- Driving violation and insurance claims information from external parties
- Geographic, census, and climate information
- Credit information
- Telematics data
- Criminal history







What 'external data' could be used in the future?

- Satellite imagery
- Social media
- Phone activity
- Biometric information
- Smart devices





Considerations when using external data

- Applicability
- Availability
- Maintenance
- Verifiability
- Matching
- Cost

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Thought experiment: Predicting fire claims on homeowners insurance

- We want to build the most accurate model ever to predict house fires
 - We have unlimited resources and can collect data we've never had before
- You've seen a shift in how personal auto is rating policyholders
 - Auto has been relying less on characteristics of a person (age, gender, etc.) and relying more on how a policyholder drives their car through telematics data
 - You want homeowners to see a similar shift where more reliance is put on how the house is used rather than characteristics of a policyholder
- What data would you want to "perfectly" predict occurrence of a house fire?
- To help with discussion, here are the top causes of house fires:
 - Cooking equipment
 - Heating units
 - Smoking
 - Candles
 - Curious children
 - Bad wiring
 - Barbecues





Thought experiment: Predicting fire claims on homeowners insurance

- Facebook has created an insurance company and has decided to use social media data to predict fire claims
- They analyze a customer's Facebook profile and posting activity to develop a "personality" grouping
- This "personality" grouping is highly predictive of fires and contains information such as:
 - Whether they are a type of person who enjoys candles
 - Whether they are a type of person who enjoys barbecuing
 - Whether they are likely to have small children at home
 - Whether they are likely to be a smoker
- Considering that the data in the previous experiment was hard to obtain, and social media data is easy to obtain, would you let Facebook use this social media data to price insurance policies? Why or why not?



Regulatory View of Predictive Models Philip Barlow, MAAA, FSA

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The views expressed in this presentation are those of the presenter and do not necessarily reflect the views, policies or regulatory authority of the Department of Insurance, Securities and Banking or the District of Columbia Government.



District of Columbia Department of Insurance, Securities and Banking

- The Department regulates insurance sold in the District of Columbia
- There are over 800 property & casualty insurers licensed in the District
- We have two staff members who review property & casualty rate filings
- Staff recently received training on reviewing filings with predictive models
- Any personal lines filings with rate increases over 5% or where the staff has issues are discussed in a meeting with the commissioner prior to resolution



District of Columbia Department of Insurance, Securities and Banking

- Generally speaking, the standard of review is rates shall not be excessive, inadequate, or unfairly discriminatory
- Predictive models present challenges in rate review:
 - Complexity makes review difficult given staffing constraints
 - Evaluating "unfairly discriminatory" for appropriateness and consistency
 - Department staff has had a harder time evaluating compliance with some filing restrictions:
 - The Department has a long-standing prohibition on territorial rating
 - The Department has also prohibited price optimization



Market Conduct Examinations of Auto Insurer Predictive Models

- The Department is currently conducting examinations of auto insurer predictive models
 - Looking at companies based on market share and rate filing history
- This is not a rate review, but rather an attempt to understand the models and the data that goes into the models
- All exams are still in progress and we have learned some things, but do not expect that all of our questions will be answered through the examinations
 - A better understanding of the models will help us ask more specific questions about filings going forward



Questions About Predictive Models and Big Data

- Credit Scores
- Shopping Around
- Cancellations
- Is an Accident Really an Accident?
- Risk Mitigation

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Assessing Big Data for Impacts Dorothy L. Andrews, MAAA, ASA

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What is Big Data?

Large volume of data – both structured and unstructured – that inundates a business on a day-to-day basis.



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Why Is Big Data Important?

Size is not as important as utility.

Big Data allows for:

- 1) Cost reductions
- 2) Time reductions
- 3) New product development
- 4) Optimized offerings
- 5) Optimized processes
- 6) Smart decision-making





Is Big Data SCARY?

Some even say CREEPY!

Factorial Growth of Big Data

- 1) Wearable devices
- 2) Home surveillance
- 3) Internet surveillance
- 4) Eye tracking
- 5) Facial recognition
- 6) Virtual reality





Opinion

What 7 Creepy Patents Reveal About Facebook

By Sahil Chinoy Illustrations by André Wee

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Is Big Data Threatening Privacy?



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Is Big Data Threatening Privacy?

"Data is the lifeblood of tech, and InsurTech is no exception. We have to figure out how to make data in the wrong hands useless."

- Dorothy L. Andrews

Rethinking data privacy regulation for the tech Renaissance era



Source: http://www.source/electronics.com/news/source/com/frames-and-police-me/1202-cellinking-data-environ-for-the-terlocenzia-ante-environ-terlo

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Is Big Data Discriminatory?

Important Highlights

- Explores the changing nature of privacy
- Big Data: Size, variety, and analytics value
- Born Digital vs. Born Analog comparisons
- Big Data easily circumvents data anonymization
- Metadata used to re-identify individuals
- Recognition of discriminatory power of Big Data
- Responsibility of notice and consent of privacy
- Government publishes > 134k machine-ready data tables





What Are Ethics?

The term ethics is derived from the Greek word *ethikos* which itself is derived from the Greek word *ethos*, meaning custom or character.

The field of ethics or moral philosophy involves developing, defending, and recommending concepts of right and wrong behavior.

It is difficult to judge what may be right or wrong in a particular situation without some frame of reference.

Three Considerations:

- I. Standards of Behavior
- II. Norms, Values, and the Law
- III. Laws versus Ethics





Is Big Data Used Ethically?

May I Borrow Your Glasses? My Reputation Depends On It! – Anita Cava

Cognitive biases impact your ethical decision-making.





Big Data Mediates Human Relationships

Chief Media Ethicist

- Independent agent
- Develop ethical brand
- Incorporate universal standards
- Operationalize brand ethics
- Monitor company ethical behavior
- Identify ethics violations
- Remedy ethics violations

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• Continually evolve the brand





Is Big Data Regulated?



Concern #1: "The use of external data sources, algorithms, and predictive models has a significant potential negative impact on the availability and affordability of life insurance for protected classes of consumers."

Concern #2: *"The use of external data sources is often accompanied by a lack of transparency for consumers."*

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Is GDPRish Good for Big Data?

Activity among the states to enact consumer data privacy laws.

Chart last updated 7/21/2019

Black strikethrough - bill postponed indefinitely

Gray strikethrough - task force substituted for comprehensive bill

	La State	egislative Process	Statute/Bill	Common Name
	California		Ca. Civ. Code §§ 1798.100199	California Consumer Privacy Act
	Connecticut		RB-1108	
	Hawaii		SB 418	
	Illinois		HB 3358	Data Transparency and Privacy Act
	Louisiana		HB 465 ¹	Internet and Social Media Privacy and Protection Act
	Maine		LD 946 "	An Act To Protect the Privacy of Online Consumer Information
	Maryland		SB 613	Online Consumer Protection Act
	Massachusetts		SD 341/S 120	
	Minnesota		HF 2917/SF 2912	
	Nevada		SB220/Chapter 603/	N Contraction of the second se
	New Jersey		S2834	
	New Mexico		SB 176	Consumer Information Privacy Act
oduced	New York		SB \$5642 ^{III}	New York Privacy Act
nmittee	North Dakota		HB-1485- ^{IV}	
hamber	Pennsylvania		HB 1049	Consumer Data Privacy Act
nmittee	Rhode Island		S0234	Consumer Privacy Protection Act
Decod	Texas		HB 4518	Texas Consumer Privacy Act
Passed	Texas		НВ 4390 ^V	Texas Privacy Protection Act
Signed	Washington		SB 5376	Washington Privacy Act

Source: https://iapp.org/media/pdf/State_Comp_Privacy_Law.pdf

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Big Data & InsurTechs



THE INSURTECH ECOSYSTEM

"Established insurance companies are investing heavily in insurtech technology to compete with lean startups. Insurtech investments cut operating costs, giving new insurtech companies a chance to compete on pricing." – *Business Insider Intelligence*



Big Data & Capitol Hill

Capitol Hill has eyes on InsurTechs & Data Scientists



The GAO Report June 2019

GAO	United States Government Accountability Office Report to Congressional Requesters
June 2019	INSURANCE MARKETS
	Benefits and Challenges Presented by Innovative Uses of Technology

GAO-19-423

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Big Data & the Academy



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Data Science and Analytics Committee

- Monitors the evolution of data science and analytics to assess impacts to professional requirements
- Assists in the development of information for the professional use of Big Data and algorithms
- Tracks convergence of the role of the data scientist with the role of the actuary for impact on professional requirements
- Continue to distinguish how actuaries perform these tasks from how non-actuaries do so







Discussion

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