

Big Data and The Role of the Actuary

March 2019

Bob Miccolis, FCAS, MAAA, FCA

Dorothy L. Andrews, CSPA, ASA, MAAA, FCA



Agenda

- Disclaimer
- Expectation of Big Data & Actuaries
- Academy's Big Data Monograph: Highlights
 - Background
 - InsurTech Advancements & Challenges
 - P&C Big Data
- Challenges
- Hot Topics
- Keeping Up With Tech



Antitrust Notice

- The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. Seminars conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings.
- Under no circumstances shall CAS seminars be used as a means for competing companies or firms to reach any understanding - expressed or implied - that restricts competition or in any way impairs the ability of members to exercise independent business judgment regarding matters affecting competition.
- It is the responsibility of all seminar participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy.



Expectations of Big Data & Actuaries?

- **InsurTech** - Big Data Analytics, Predictive Models, Artificial Intelligence for Insurance Applications
- **How can actuaries innovate** via InsurTech while maintaining the confidence of the public?
- **Competitive Advantage** - Will actuaries lose their influence if InsurTech is not a core competency?
- **Using InsurTech to benefit the public** - A theme that actuaries need to embrace
- **Public Trust** - Biggest concern driving regulation is about behaviors of insurers and insureds



Big Data and the Role of the Actuary

JUNE 2018

American Academy of Actuaries Big Data Task Force

Bob Beuerlein, MAAA, FSA, FCA, CERA—*Chairperson*
Dorothy Andrews, MAAA, ASA, CSPA—*Vice Chairperson*
Mary Bahna-Nolan, MAAA, FSA, CERA
Elena Black, MAAA, EA, FCA, FSA
Elizabeth Brill, MAAA, FSA
Patrick Causgrove, MAAA, ACAS
Robert Curry, MAAA, FCAS
Ian Duncan, MAAA, FSA, FCIA, FIA
Seong-Min Eom, MAAA, FSA
Andy Ferris, MAAA, FCA, FSA

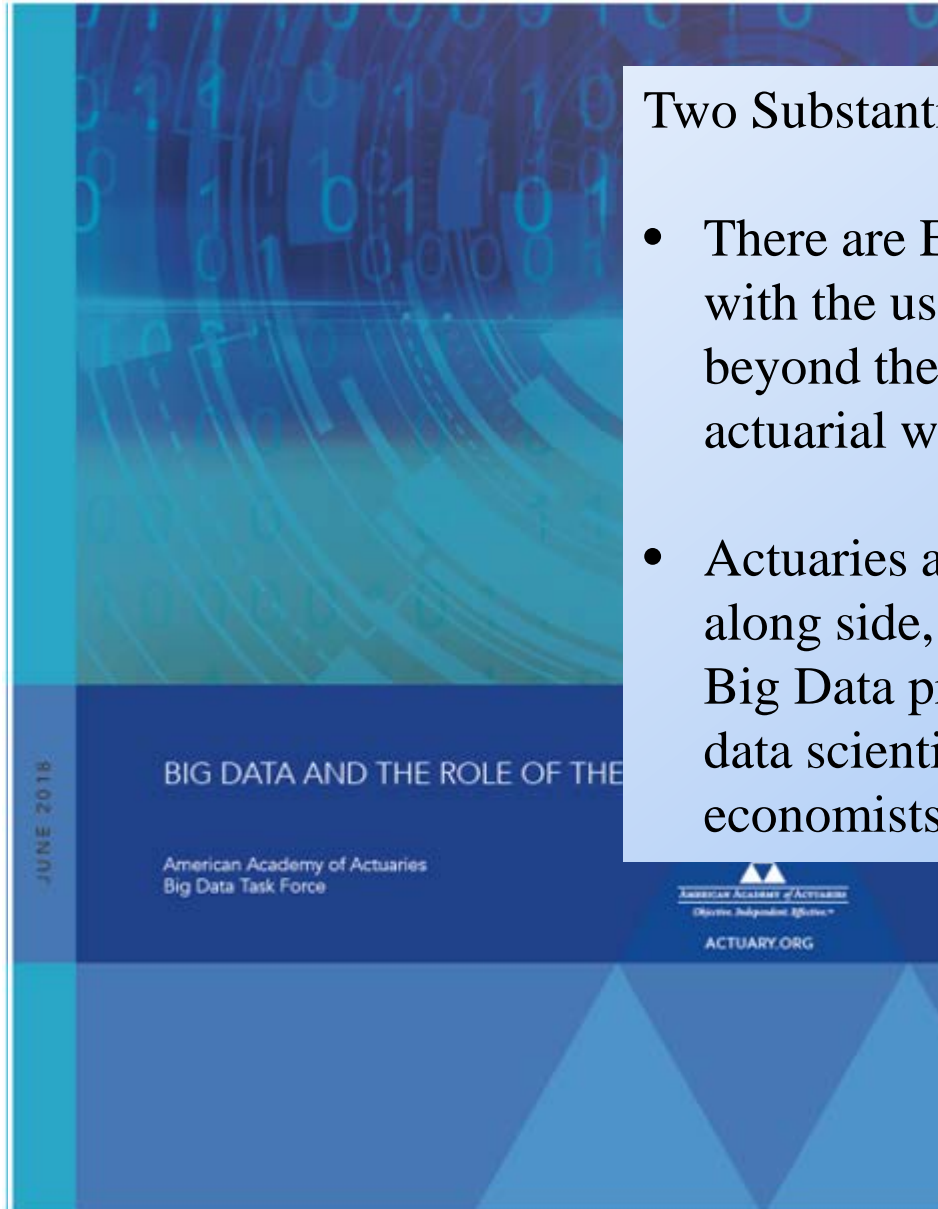
Audrey Halvorson, MAAA, FSA
William Hines, MAAA, FSA
Liaw Huang, MAAA, EA, FCA, FSA
Robert Miccolis, MAAA, FCA, FCAS
David Sandberg, MAAA, FSA, CERA
Martin Snow, MAAA, FSA
Jim Toole, MAAA, CERA, FSA
Jason VonBergen, MAAA, FSA

JUNE 2018

BIG DATA AND THE ROLE OF THE ACTUARY

American Academy of Actuaries
Big Data Task Force





Two Substantive Issues:

- There are Ethical & Professionalism issues with the use of Big Data that extend well beyond the traditional framework of actuarial work
- Actuaries are faced with either working along side, or isolated from, influential Big Data professionals – in particular, data scientists, statisticians and behavioral economists



THE 10 Vs OF BIG DATA



Source: xenonstack.com



4 Practice Areas





Automotive
(168 Companies)

Employee Benefits Platforms
(92 Companies)

Enterprise/Commercial
(161 Companies)

Health/Travel
(167 Companies)

Insurance Data/Intelligence
(127 Companies)

Consumer Management Platforms
(109 Companies)

Insurance Education/Resources
(38 Companies)

Insurance User Acquisition
(124 Companies)

Life, Home, P&C
(158 Companies)

P2P Insurance
(35 Companies)

Product
(46 Companies)

Reinsurance
(31 Companies)

INSURANCE TECHNOLOGY

VS/ VENTURE SCANNER

The [Venture Scanner](#) research platform currently tracks 1503 insurance technology startups with \$22B in funding

Insurance Comparison/Marketplace
(420 Companies)

Insurance Infrastructure/Backend
(297 Companies)

The graphic above shows only a sampling of companies in each category. Data cumulative through March 2018

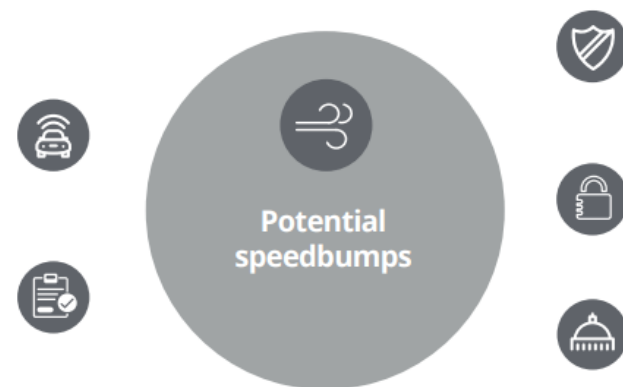
Observations

- Rules of Engagement - changed & still changing
- New areas of risk - emerged & still emerging
- Advanced technology - improvements with conflicts
- Simplified U/W viewed as post-claim U/W (denying coverage based on poor answers to insurance app)
- Market conduct scrutiny - regulatory concerns - alleged unfair treatment by insurers - public trust
- Regulators dilemmas - limited resources, steep learning curve to accept complex models, distrust of black boxes, lack of confidence in big data use



Common Practice Issues for Actuaries

- Regulatory Uncertainty
- Data Privacy Confusion
- Professional Standards
- Glass Boxes vs. Intellectual Property
- Media Mediation
- Behaviorism (manipulation and control of human behavior)



A number of challenges could undermine an insurer's ability to bolster market share, profitability, and innovation efforts.



Common P&C Issues with Big Data & InsurTech

- Selective Marketing of Insurance (pre-U/W)
- Lack of Transparency - underwriting & pricing
- Pricing Tiers - by insurers within a group
- Selective coverage options & restrictions
- Personal vs. categorical data - if & how to use
- Proving/disproving Unfairly Discriminatory





Challenges

- Training in new data analytics
- The future of technology mediation
- Societal impact on business processes
- Evolving generational risk perceptions
- Expanding variety of data and new ways to identify & utilize data to apply to insurance
- 50 States – 50 Regulatory Environments



Artificial Intelligence (Algorithmic Decision Systems)

- **What is it?** - computer systems, algorithms, big data, data mining, machine learning, neural networks, predictive models, data-driven decisions, etc.
- **Why does it matter?** - impact on society, culture, economy, trust/distrust in technology, replicating undesirable human behaviors - What is acceptable? Will we need AI to help govern AI?
- **Legal, Professional & Ethical Risks** - for individuals (unethical discrimination, unfair practices, privacy, etc.), for the economy (unfair practices, limited access to markets, etc.) and for society as a whole (manipulation, unacceptable bias, etc.)
- **Can AI be trusted?** - Is trusted AI an oxymoron? What ethical tenets and professionalism standards should apply to AI?



Artificial Intelligence

(Algorithmic Decision Systems)

- 3/14/19 briefings - European Parliamentary Research Service:
 - How artificial intelligence works
[http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/634420/EPRS_BRI\(2019\)634420_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/634420/EPRS_BRI(2019)634420_EN.pdf)
 - Why artificial intelligence matters
[http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/634421/EPRS_BRI\(2019\)634421_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/634421/EPRS_BRI(2019)634421_EN.pdf)
 - Artificial Intelligence: Legal & ethical reflections
[http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/634427/EPRS_BRI\(2019\)634427_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/634427/EPRS_BRI(2019)634427_EN.pdf)
- 3/5/19 report - European Parliament Think Tank
Understanding algorithmic decision-making: Opportunities and challenges
[http://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU\(2019\)624261_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261_EN.pdf)
[http://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU\(2019\)624261\(ANN1\)_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261(ANN1)_EN.pdf)



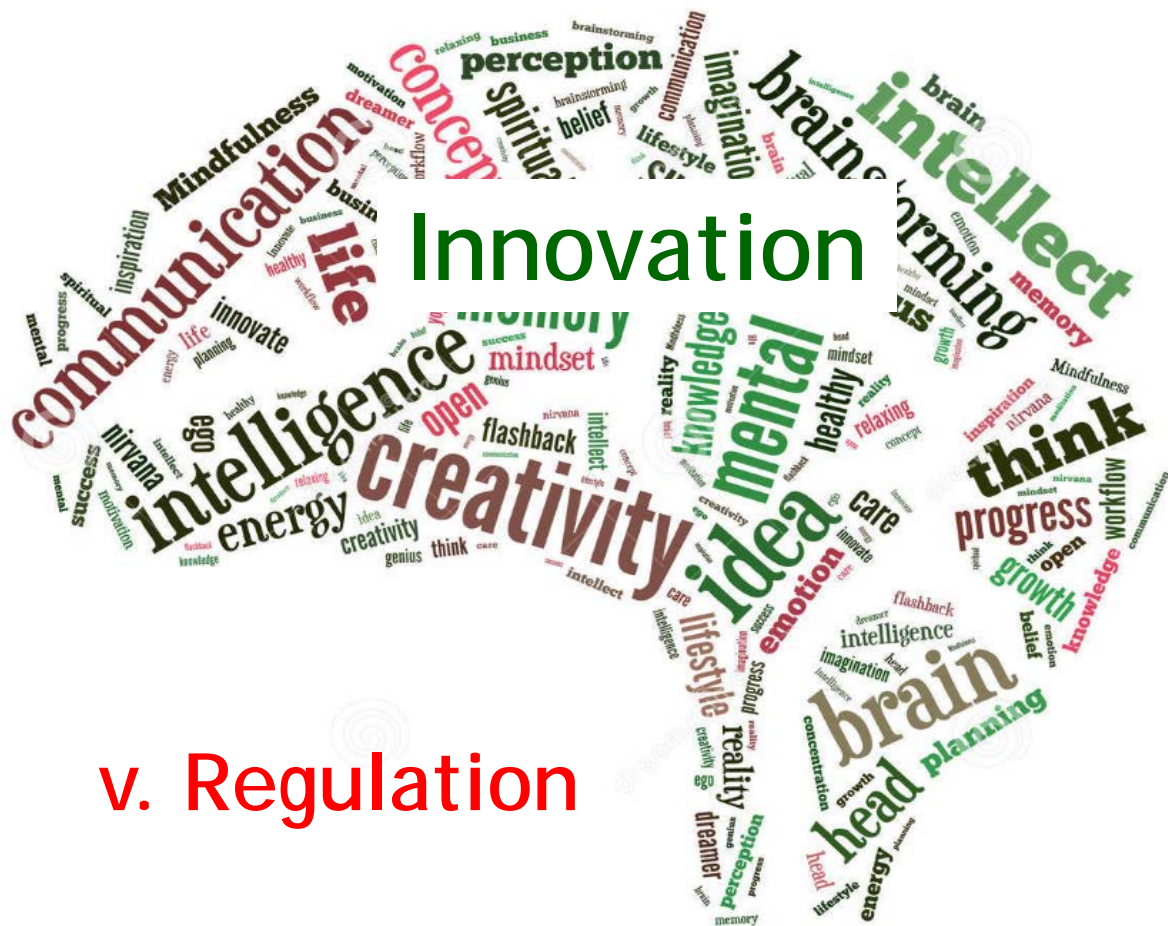
Hot Topic #1

Top GAO Concerns

- InsurTech Applications
- Actuaries v. Data Scientists
- Benefits & Challenges
- Regulatory Coverage
- Data Protections



Hot Topic #3



v. Regulation

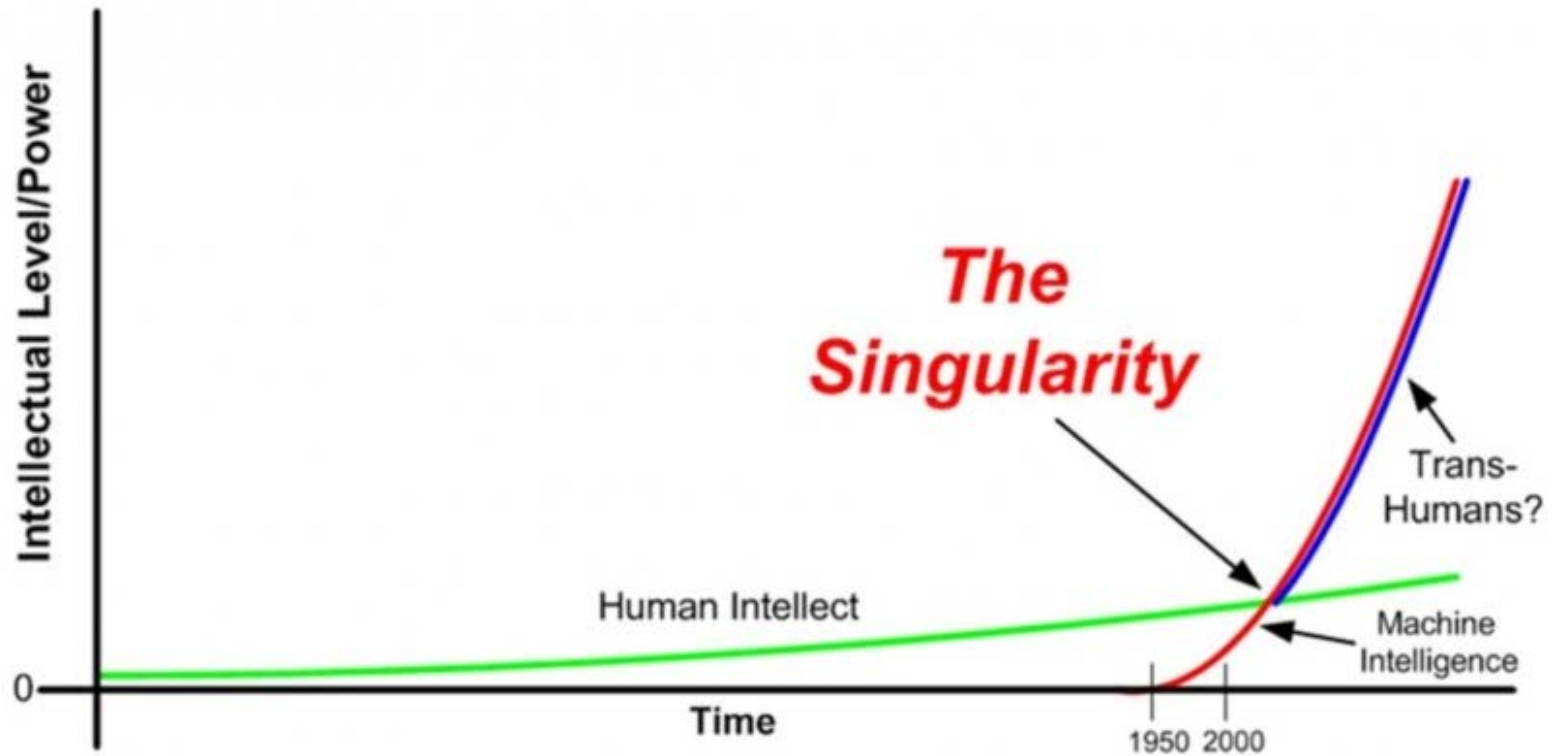




Hot Topic #5



Hot Topic #6



Source: <https://hpluspedia.org/wiki/File:Singularity-graph.jpg>





Keeping Up With InsurTech

- Can insurers keep up with the technology issues?
- Are data scientists outpacing actuaries in successfully applying new technology skills?
- Will insurers lead insurance innovation or will others step in?
- What happened to the regulatory sandbox idea?
- What InsurTech innovation would we like to see?
- Are you keeping up with new technology?





Casualty Actuarial Society
4350 North Fairfax Drive, Suite 250
Arlington, Virginia 22203

www.casact.org

