

# CAS RATEMAKING, PRODUCT, AND MODELING SEMINAR AND WORKSHOPS

March 25-27, 2019

Westin Boston Waterfront  
Boston, MA

## Seminar Overview

The Ratemaking, Product and Modeling (RPM) Seminar provides a forum for presenting and discussing significant issues in ratemaking and product management. This seminar will consider how these two areas influence each other and will include the use of predictive modeling techniques in both. The program includes a range of topics to interest professionals and students in a number of related disciplines. Moreover, the seminar provides an opportunity to meet the continuing education needs of actuaries and other professionals whose responsibilities include ratemaking, underwriting, and product management.

This year's RPM Seminar offers more than 60 different concurrent sessions, covering data management and technology, workers' compensation, commercial lines, personal lines, predictive modeling, professionalism, regulation, rate of return, and product management topics. The seminar also features optional pre-program workshops on basic and advanced predictive modeling, severe weather, an introduction to Python, communication skills, enterprise risk management, and product development.

This seminar is recommended for actuaries, underwriters, insurance professionals, and others who require an understanding of state-of-the-art developments. The seminar follows a format of panel sessions, many using slides and interactive formatting to augment the presentations. Illustrative numerical examples are used whenever possible. Audience participation is encouraged.

## Ratemaking, Product, and Modeling Seminar Planning Committee

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## TWEET FROM THE RPM SEMINAR! #CASRPM19

What's happening at the 2019 RPM Seminar? We want to hear from you!  
Tweet about the RPM educational sessions and meeting events using the hashtag #CASRPM19.



**Follow the CAS on Twitter @CASact**

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If you cannot access Facebook, Twitter and LinkedIn from your office, please consider signing up to follow us from your personal account at home.



Please visit our website at [www.casact.org](http://www.casact.org) and click the social media widgets to find our pages!

## DOWNLOAD THE CAS MEETING APP



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# GENERAL INFORMATION

## Continuing Education

The CAS Continuing Education Policy applies to all ACAS and FCAS members who provide actuarial services. Actuarial services are defined in the CAS Code of Professional Conduct as “professional services provided to a Principal by an individual acting in the capacity of an actuary. Such services include the rendering of advice, recommendations, findings, or opinions based upon actuarial considerations.”

Members who are or could be subject to the continuing education requirements of a national actuarial organization can meet the requirements of the CAS Continuing Education Policy by satisfying the continuing education requirements established by a national actuarial organization recognized by the Policy.

This activity may qualify for up to 13.5\* CE Credits for the Ratemaking, Product and Modeling Seminar for CAS members. Breakfast Roundtable attendees may add up to .9\* CE credit per roundtable. Workshop attendees may add up to a maximum of 7.2\* CE credits. Participants should claim credit commensurate with the extent of their participation in the activity. CAS members earn 1 CE Credit per 50 minutes of educational session time not to include breaks or lunch.

*\*The amount of CE credit that can be earned for participating in this activity must be assessed by the individual attendee. It also may be different for individuals who are subject to the requirements of organizations other than the American Academy of Actuaries.*

## Handouts and Evaluations

Session slides are posted on the CAS Web Site so that attendees can download, print, and bring handouts as desired. Please note that not every presenter will choose to provide a presentation handout for his or her session.

Attendees are encouraged to view the list of attendees electronically, complete the online evaluation forms, and download presentations for the sessions they attend. The CAS appreciates your participation in this effort to reduce the Seminar’s carbon footprint and impact.

## Registration Hours

The RPM seminar registration desk is located in the Marina Ballroom Foyer and will be open as follows:

- Sunday, March 24, 2019..... 3:00 p.m. – 5:00 p.m. (Workshop Registration ONLY)
- Monday, March 25, 2019 ..... 8:00 a.m. – 2:00 p.m. (Workshop Registration ONLY)
- Monday, March 25, 2019 ..... 3:00 p.m. – 6:00 p.m. (Seminar Registration)
- Tuesday, March 26, 2019..... 7:00 a.m. – 6:30 p.m. (Seminar Registration)
- Wednesday, March 27, 2019..... 7:00 a.m. – 2:00 p.m. (Seminar Registration)

# GENERAL INFORMATION

## Hotel Information

The Westin Boston Waterfront  
425 Summer Street  
Boston, MA 02210  
(617)532-4600

Checkout time is 12:00 p.m. Those checking out before the conclusion of the meeting may check their bags at the bell desk of the hotel. The Casualty Actuarial Society is not responsible for lost or stolen items left unattended in public areas of the hotel. CAS staff is unable to accept any bags or other personal items at the registration desk.

**Security Note:** When leaving the meeting room for an extended period of time, please take valuables and personal belongings with you. Neither the CAS nor the **Westin Boston Waterfront** can be held responsible for lost or stolen items.

## Seminar Attire

Business casual attire is suggested for all sessions as well as the evening receptions on Monday and Tuesday. As meeting room temperatures and personal comfort levels may vary, it is recommended that you bring a sweater or jacket to the sessions. In Boston, the average high temperature during March is 48 degrees and the average low is 34 degrees.

## Interactive Livestreaming at RPM Seminar

Again this year, participants will join a select few of the RPM seminar sessions virtually. Viewers will participate live in a few of the seminar sessions remotely from around the globe. Participants attending virtually will have the opportunity to interact with other virtual attendees as well as pose questions to the panel during the session.

### Livestream Sessions, Sponsored by Travelers

#### **8:00 a.m. – 9:45 a.m.**

Welcome/Keynote Address: The Moral Machine Experiment: Analyzing 40 Million Ethical Dilemmas about Driverless Cars

#### **10:15 a.m. – 11:30 a.m.**

Concurrent Session 1: M-8: The Predictive Modeling Cooking Show

#### **12:30 p.m. – 1:45 p.m.**

Concurrent Session 2: IET-5: The Changing Role of the Actuary in the Face of Disruption

#### **2:15 p.m. – 3:30 p.m.**

Concurrent Session 3: IET-6: Insurance Claims Prevention Using New Predictive Analytics

#### **4:00 p.m. – 5:15 p.m.**

Concurrent Session 4: R-11: Auto Insurance: What Happened and What Happens Next?



# GENERAL INFORMATION

## RPM Seminar Prizes

### Exhibitor Raffle

We are holding a raffle for attendees who visit all of our participating exhibitors. The winner will receive a \$250 American Express gift card.

Raffle Form: In your registration bag you received a raffle entry form. Visit each participating exhibitor and ask a representative to initial your form. Once you have initials from all participating exhibitors, submit the form at the Registration Desk by 12:00 pm on Wednesday, March 27 to be entered into the drawing.

The winner will be announced on site during the closing session.

### 2019 RPM Seminar and Workshops Rating System



No prior knowledge of the subject matter is assumed, or little or no technical content.



General knowledge of the subject matter is assumed, or moderate technical content.



General or working knowledge of the subject matter is assumed, or moderate to highly technical content.

More detail about the session and speakers is found on the CAS Meeting App (see page 2). All sessions will be recorded, except where indicated.



**Checkbox for Personal Attendance Record**



**Recorded Session**



**Livestreamed Session**

# GENERAL SESSIONS

□  **General Session 1: The Moral Machine**  
**Experiment: Analyzing 40 Million Ethical Dilemmas**  
**about Driverless Cars** 



Opening Session/iCAS Ceremony/General Session 1, Tuesday, March 26,  
8:00 a.m. – 9:45 a.m. Grand Ballroom AB

The rapid development of artificial intelligence has created concerns about how machines will make moral decisions in critical situations. For example, should an autonomous vehicle prioritize the safety of its own passengers over pedestrians? Should it prioritize children's safety over adults? Should it prioritize one law-abiding pedestrian over two jaywalkers? This presentation will describe lessons learned from crowdsourcing 40 million decisions from all over the world about such ethical dilemmas. Included will be a robust discussion about how we might soon audit algorithms against societal expectations.

Moderator: James Guszczka, U.S. Chief Data Scientist, Deloitte Consulting, LLP  
Speaker: Iyad Rahwan, Ph.D., Massachusetts Institute of Technology

□  **General Session 2: Insurtech: The Right Tools for the Job** 

General Session/Closing, Wednesday, March 27, 1:15 p.m. – 2:30 p.m., Marina Ballroom I-IV

A panel of insurtech experts will discuss how these organizations are assisting the insurance industry by providing tools needed to be successful. Panelists will cover the importance of appropriate platforms and data for successful ratemaking and underwriting innovation.

Moderator/Speaker: Véronique Grenon, Managing Director/Global InsureTech Research Lead, Guy Carpenter  
Speaker: Kuldeep Malik, Co-founder and CEO, DataCubes

# WORKSHOPS

Pre-registration is required to attend a workshop

Monday, March 25, 9:00 a.m. – 5:00 p.m.

## ❑ **W-1: Severe Weather**

Stone

This popular workshop gives attendees an opportunity to learn more about how natural catastrophe models are developed and used within property-casualty insurance. The interactive session will include other discussions around weather and how it has affected property insurance over recent periods.

Facilitators: Steve Kolk, Actuary & Climate Data Scientist, Kolkulations LLC  
Howard Kunst, Chief Actuary, CoreLogic

## ❑ **W-2: Predictive Modeling with Generalized Linear Models**

Marina Ballroom I

This popular, hands on, interactive predictive modeling workshop has been offered at the RPM seminar for several years. It will be conducted in the R statistical computing language, which is widely adopted by statisticians and data scientists.

The course will provide a refresher of regression theory before proceeding to a variety of practical modeling applications and case studies. The focus will be on generalized linear models (GLMs) — their specification, interpretation, and validation. A variety of distributions will be covered, including classical, Poisson, logistic, gamma, and Tweedie. Other topics will be discussed and illustrated as time permits. All datasets will be distributed to attendees prior to the seminar.

Facilitators: Mark Goldburd, Milliman, Inc.  
Manyi Luo, Actuarial Analyst, Milliman, Inc.

## ❑ **W-3: Product Development**

Otis

This workshop will explore the different stages of the product lifecycle — from ideation through design, development and launch – with hands-on exercises for the attendee. Industry leaders will serve as facilitators to review the and guide the attendees through the lifecycle and the realities of developing an insurance product.

Facilitators: Julia Blyumin, Consultant, Deloitte Consulting, LLP  
Katey Walker, Senior Director, Willis Towers Watson  
Donald Hendriks, Actuary and Data Scientist, CARFAX Banking & Insurance Group

# WORKSHOPS

## □ **W-4: Introduction to Python**

### Marina Ballroom II

As actuaries work more and more with teams of data scientists and software engineers, they are more likely to encounter use of the Python programming language. While R is an environment for performing statistical analysis, Python is a general purpose programming language.

This workshop will:

- Provide an introduction to Python.
- Show how to perform data collection, data visualization, and data analysis in Python.
- Point toward resources for further learning.

Colaboratory, a free research platform provided by Google, will be used for instruction. Attendees will need a free Google account and a laptop or device with an up-to-date browser like Chrome or Firefox. Attendees may also use Python and Jupyter if it is installed on their devices. A short exercise will be sent out to attendees before the workshop so that they may test the use of this platform. More details can be found at <https://research.google.com/colaboratory/faq.html>.

Facilitators:                    Brian Fannin, Research Actuary, Casualty Actuarial Society  
   Stephen Mildenhall, St. John's University  
   John Bogaardt, WCF Insurance

## □ **W-5: Advanced Predictive Modeling**

### Marina Ballroom IV

Although the generalized linear model (GLM) is a natural foundation for much actuarial work, it is best viewed as a starting point, not the last word on the subject. This full-day, hands-on workshop will discuss a variety of statistical learning methods that either refine or serve as complements to the GLM framework.

Before the introductions of more advanced predictive modeling techniques, there are some important considerations for more formal modeling studies. The topic of reproducible research, sampling, and hyperparameter tuning will be discussed and illustrated.

Next, you will learn about regression approaches that will expand your toolkit to deal with advanced problems like dealing with large numbers of predictors and fitting nonlinear relationships. We will cover both the theory and practice of using penalized regression and generalized additive models.

The concept of “ensembling” and basics of decision trees as an alternation to GLM will also be introduced individually and predictive models will be built based on combination of the concepts of ensembling and decision trees. All practical examples will be coded in R, with opportunity to work with the code individually or in groups.

Facilitators:                    Jason Rodriguez, Lead Data Scientist, Willis Towers Watson  
   Hoi Leung, AIG  
   Jean-François Greeff, Manager, PricewaterhouseCoopers

# WORKSHOPS

## ☐ **iCAS Predictive Analytics Community of Practice Event**

Lewis

Designed for advanced practitioners working in the area of predictive analytics/data science, this full-day event will include panels, presentations, and roundtable discussions of advanced topics in predictive analytics within and outside of the insurance fields. Modeled after the CAS Institute's successful Community of Practice Event last year, some of the proposed topics include bringing actuarial science into the data science fold, claims analytics, social implications of using data, data preparation tools, research opportunities available to members of iCAS, and CSPA continuing education requirements.

Monday, March 25, 9:00 a.m. – 12:30 p.m.

## ☐ **W-6: Communication – Math Geeks Learn to Speak**

Marina Ballroom III

Public speaking is something that many people dread, but it doesn't have to be that way! Learn to craft your message so that it's interesting to your audience and fits in the time allowed. Practice techniques for combatting nervousness and improving your credibility. Better communication skills will help you in front of large groups, in small meetings, one-on-one with coworkers or managers, and even (or especially) at home. This workshop is held in conjunction with the Monday afternoon's half-day data visualization workshop, W-7.

Facilitators: Christine Ross, Director, P&C Reserving, Cincinnati Insurance Companies  
Thomas Hess, Retired

Monday, March 25, 1:30 p.m. – 5:00 p.m.

## ☐ **W-7: Data Visualization**

Marina Ballroom III

Using examples and hands-on applications for data visualization, attendees will learn how to create graphs, charts and maps that enhance how information can be communicated..

Facilitator: Steve Ellis, Deloitte Consulting LLP

# ROUNDTABLE DISCUSSIONS

There is no pre-registration required to attend a roundtable discussion. A maximum of 12 participants will be allowed in each roundtable discussion. Participation is first-come, first-served.

## ❑ **RT-1: The Great Coding Debate: R vs. Python vs. SAS**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Marina Ballroom I

The debate of the optimal software platform(s) to support various business (and life) functions is one that evolves as we speak. We will discuss pros, cons, and best practices in R, Python, and SAS for various actuarial functions such as modeling, data wrangling, and visualization. Let the debate begin!

Facilitator: Khanh Luu, AIG

## ❑ **RT-2: Predictive Modeling Pitfalls: Challenges in Application**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Otis

There are many success stories featuring predictive models, but there are also numerous cautionary tales in which the results of well-constructed models were misunderstood, misapplied, or not adopted at all. This session will feature several short and entertaining stories illustrating common pitfalls in getting business value from predictive models. Participants will be also be invited to share their own hard-learned lessons.

Facilitator: Daniel Root, Vice President-Business Solutions Consultant, AXA XL

## ❑ **RT-3: The CAS Institute**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Marina Ballroom II

Come explore The CAS Institute's Certified Specialist in Predictive Analytics (CSPA) credential and find out about iCAS membership, the new Catastrophe Risk Management credential, and the Experienced Practitioner Pathway — a way to achieve either credential. Take advantage of the opportunity to ask questions of representatives of the Leadership Advisory Council and Subject Matter Expert groups and to meet The CAS Institute's director.

Facilitators: Todd Lehmann, Quincy Mutual Fire Insurance Co.  
Amy Brener, Director, The CAS Institute

# ROUNDTABLE DISCUSSIONS

## □ **RT-4: Do CAS Exams Pass the Test of Time?**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Stone

CAS exams take thousands of study hours to pass, a small army of volunteers to design and administer, are conducted in a synthetic problem-solving environment, and teach a variety of skills and knowledge in areas many actuaries may never even practice. Are the exams doing it right? Could they do better? Led by members of the newly formed CAS Task Force on Education, this roundtable will explore how we might optimize the CAS education process to ensure a more vibrant profession in the long and short term.

Facilitator: Jim Weiss, Actuary, Crum & Forster

## □ **RT-5: Reflections on Actuarial Autonomy After Stronger as One**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Marina Ballroom III

A serious risk for any actuarial society is that actuaries (be they P&C, life or pension or something else) could fail the public trust and the government could move in to regulate the actuarial profession directly. In this session we will discuss:

- Does a larger organization make us more effective at self-regulation?
- Does autonomy keep P&C actuaries safe in case a pension crisis causes the government to regulate the SOA to get more control over the pension actuaries?
- Do we get tarred by the brush of another actuarial failure no matter what, and could the opposite also apply (e.g., a P&C actuarial failure affecting other practice areas)?

Facilitator: David Wright, Senior Vice President/Managing Director, Beach and Associates Ltd.

## □ **RT-6: Enhanced Cyberrisk Assessment via Predictive Analytics**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Hancock

One of the challenges the cyber insurance industry faces today is the quantifiable measurement of an organization's cyber security risk. A key challenge to measuring risk is the interpretation of risk "signals" — and the evolving mix of human behavior and technology makes this especially challenging. This roundtable will discuss how insurers are using analytics and data science, based on externally viewable conditions, to understand organizational behaviors that can predict the likelihood of an enterprise suffering a data breach.

Let's discuss:

- Why empirical approaches to underwriting decisions typically outperform judgmental methods.
- How ongoing monitoring of observable network conditions and network activity can be used to infer organizational behavior.
- Whether an enterprise following cyber hygiene best practices might receive more favorable underwriting consideration.
- How analytics can provide underwriters with an objective measurement with increased transparency in cyberrisk.

Facilitator: Lamont D. Boyd, Director-Insurance Scores & Analytics, FICO

# ROUNDTABLE DISCUSSIONS

## □ **RT-7: What Climate Change Means for Risk Assessment**

Roundtable Discussions, Tuesday, March 26, 7:00 – a.m. – 7:45 a.m., Marina Ballroom IV

What should actuaries, data scientists, product managers, and risk officers think about climate change and insurance risks? This roundtable will discuss insurance climate risk assessment methods and tools, including the Actuaries Climate Index® and the Actuaries Climate Risk Indices.

Facilitator: Steve Kolk, Actuary & Climate Data Scientist, Kolkulations LLC

## □ **RT-8: The Big Long: Multiperiod Pricing Strategy**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Webster

Join members of the newly formed CAS Long-Term Pricing Analysis Working Party to discuss questions not limited to:

- Which financial metrics are commonly being used to assess short- and long-term performance?
- Is there a calculable metric to guide decision makers in assessing the tradeoffs of response time versus expense when looking to optimize chosen metrics?
- Are there any universal advantages or disadvantages regarding pricing features in the long term? If so, which features are most effective at achieving which financial metrics?
- What best practices and considerations for actuarial pricing should be in place to ensure trade offs are understood by the business partners?

Facilitators: Sandra Callanan, Vice President, Risk Management, Donegal Insurance Group  
Brian Fannin, Research Actuary, Casualty Actuarial Society



# ROUNDTABLE DISCUSSIONS

## □ **RT-9: Keeping it Real About Artificial Intelligence**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Alcott

Practitioners and observers of any experience levels are welcome to join us for some intelligent conversation regarding artificial intelligence. Discussion topics will include methods, applications, and cost-benefit trade offs, as well as how to get started and how worried we should be about the singularity.

Facilitator: Jason Rodriguez, Lead Data Scientist, Willis Towers Watson

## □ **RT-10: MicroBOP — The Growing Gig and Shared-Space Economy (and its Effect on Small Commercial Insurance)**

Roundtable Discussions, Tuesday, March 26, 7:00 a.m. – 7:45 a.m., Douglass

Of the 29 million small businesses in the United States, 80 percent have no employees. Approximately half of all small businesses are home-based and 69 percent of entrepreneurs start their businesses in their homes. While these businesses are primarily operated out of the home, business activities may take place at other locations (e.g., shared retail space, “pop-up” vendors, automated vending, professional offices, and shared services/space). In this roundtable we will discuss dynamics contributing to the growth of this economy and general actuarial considerations such as targeting, pricing, and coverage/limit selection.

Facilitator: Bei Zhou, Actuarial Product Director, ISO/Verisk

# LEARNING LABS

During this year's seminar we invite you to explore a new education concept. Don't miss out on our exciting new learning lab experience.

## What's New?

- Opportunity for streamlined interactive learning
- Code or practice in live environment with collaborative, coached learning
- Learn important, immediately actionable skills in a highly compressed learning experience
- Ability to test learnings during the session

### **LL-1: Who Wants to Visualize Like a Baller?!**

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Marina Ballroom IV

Want to analyze and visualize data like a baller? Only have 75 minutes to spare? We have exactly the learning lab for you! All you need to do is bring an internet-connected laptop with R Studio pre-installed, and your brain, to Boston, Massachusetts, and our facilitators will prompt you through a brisk and refreshing analytics exercise. You'll start by reading in some gnarly sharing economy data from our charming host city of Boston. Then you'll tidy it up and draw out some broad themes. After that you'll plop it on a map and produce some stunning views — as well as some ugly views so you can see how non-ballers live. Finally you'll bring it home, undo all your progress, and conclude with some regressions that may or may not help us decide where to hold this conference the next time it's in Beantown. Whether you're new to R or simply looking to test your game, you can't avoid this Learning Lab. **Attendees will need a laptop for this lab.**

Moderator/Speaker: Madeline Main, Willis Towers Watson

Speaker: Jim Weiss, Actuary, Crum & Forster

### **LL-2: Presentations, Conversations and Articulations: Public Speaking for (Those Who are Not) Dummies**

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Marina Ballroom IV

A large part of our day-to-day professional employment involves communicating with others. While many of us often feel we “live” on email, we do also speak with people face-to-face or over the telephone. This interactive, hands-on Learning Lab will help us hone our verbal communication skills. Using the meeting format that is part of the successful Toastmasters program, we will hear some short presentations on communication tips and tricks, including guidelines for presenting technical material to nontechnical audiences. In addition, attendees will be given the opportunity to speak “off the cuff” for one to two minutes on a variety of RPM-related topics (e.g., do you prefer R or Python and why?).

Moderator/Speaker: Amy Brener, Director, The CAS Institute

Speaker: Brian Fannin, Research Actuary, Casualty Actuarial Society

# CONCURRENT SESSIONS

## Innovation and Emerging Trends

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☐  **IET-1: Personalizing Policy Coverage Options with Analytics for a Customer-Centric Competitive Advantage** 

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Otis

In exploring personalization, we will learn how the personalization methods and techniques that leading digital companies leverage can be applied to traditional online insurance policies, coverage packages, and bundles. We will see how carriers can customize these products to suit customer needs while meeting organizational goals. We will look at the benefits of insurance product personalization, including maximizing conversions, revenues, and profits in real time. We will also understand the implications of price for personalization — including the evolution from cost-based pricing, to price optimization, to lifetime-value pricing — and how this affects personalization. Attendees will leave with a better understanding of what initiatives they should start working on today to prepare for the future of customer-centric pricing and personalization. The session will conclude with five ways that insurance carriers can get started today with this new level of personalization.

Moderator/Speaker: Jon Moran, Earnix

Speakers: Lucy Kadets, Product Manager, Earnix  
Toby Alfred, Principal, Digital Transformation Strategies LLC

☐  **IET-2: Internet of Things: How Autonomous Cars Drive Better than Humans and How to Insure Them** 

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Webster

Vehicles are being developed with autonomous driving features, some of which are being rolled out into personal lines vehicles, commercial transportation network systems, and other fleets of vehicles. Autonomous driving may reduce crashes and, in turn, reduce insurance costs, but it also creates new types of exposure from autonomous features (cyber and product liability) that are not traditionally needed in an auto insurance product. This presentation will demonstrate how the risk exposure is changing, how the insurance product must evolve to cover the changing insurance needs, and how an insurance product can be developed using insurtech solutions like telematics to price and deliver the appropriate coverages. It's time to get out of the dinosaur era and into the future with new modes of transportation insurance!

Moderator: Sandra Callanan, Vice President - Risk Management, Donegal Insurance Group

Speakers: Sheri Scott, Principal & Consulting Actuary, Milliman, Inc.  
Edward Ford, Chief Actuary, Zendrive

# CONCURRENT SESSIONS

## ☐ **IET-3: Insurtech from the Perspective of a Founder**

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Douglass  
Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Webster

Over the last few years, there has been a surge of activity among insurtech startups, fueled by billions of dollars of venture investment — some at eye-popping valuations. The resulting space is cluttered, confusing, and changing fast. In this session, you'll hear the first-hand perspective of a former senior executive who left a top-five insurer to start his own insurtech company. Ty Harris was the executive vice president and chief product officer for personal lines at Liberty Mutual before creating Openly Inc, a new personal lines platform. In addition to telling you about Openly and his personal journey, Ty will give his take on the industry's likely evolution, what it will take to win, and the hype vs. reality of today's crop of insurtechs.

Moderator/Speaker: Ty Harris, Founder & CEO, Openly Inc.

## ☐ **IET-4: The “Nitty Gritty” of Developing Valuable Microinsurance Products**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Hancock

Learn the basics of microinsurance, its product development process, and how its pricing differs from the traditional market. This session's speaker will take the audience through the pricing process, highlighting the role of the actuary in microinsurance, and he will provide real-world examples of casualty microinsurance product development drawn from his 25+ years' working in the field. Participants will walk away with practical examples and a more concrete understanding of how valuable casualty microinsurance is.

Moderator: Jim Weiss, Actuary, Crum & Forster

Speaker: Michael McCord, Principal & Managing Director, MicroInsurance Centre at Milliman

## ☐ **IET-5: The Changing Role of the Actuary in the Face of Disruption**

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Grand Ballroom A

Many jobs across the economy are quickly becoming disrupted as a result of advanced technologies like cognitive automation and artificial intelligence, as well as alternative workforce arrangements. Are actuaries next? This session will introduce the concepts underlying robotics and cognitive automation, and will also explore alternative talent models such as the use of off-balance sheet resources. Using a process called Pixelation, this session will explore the many tasks that actuaries perform and what parts of our roles could be automated, augmented, or replaced. At the same time, we will discuss how this disruption can have a positive impact on the actuarial role, how actuaries are thriving in this emerging environment by embracing new technologies and an innovation mindset, and how the profession can ultimately provide even more value to our constituents.

Moderator/Speaker: Kelly Cusick, Managing Director, Deloitte Consulting, LLP

Speakers: Stefan Peterson, Manager, Deloitte Consulting, LLP  
Robert Galbraith, Author and Keynote Speaker, Insurance Nerds

# CONCURRENT SESSIONS

## **IET-6: Insurance Claims Prevention Using New Predictive Analytics**

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Grand Ballroom A

Insurers creatively and insightfully use big data to answer questions about risk. Yet despite progress, we still face significant, unanswered questions in segmenting risk for perils causing over \$20 billion in annual losses in homeowners and an equal amount in auto. One of the most vexing questions is how to use data to predict and subsequently avoid insurance claims, particularly for complex perils driven by many causes. With connected risks, insurers are able to detect situations in real-time that could likely lead to a claim, thus allowing them to develop strategies to mitigate risk. This panel session will focus on demonstrating new approaches in risk assessment to predict auto and non-weather fire and water claims, and emphasizing what insurers can do with this new information to avoid or mitigate the risks of such claims.

Moderator: Todd Lehmann, Quincy Mutual Fire Insurance Co.

Speakers: Andrew Schiller, Location, Inc.  
Charles Dugas, Head of Insurance, Element AI

## **IET-7: Artificial Intelligence in Insurance: Theory and Practice**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Marina Ballroom I

Artificial intelligence capabilities and applications continue to expand within insurance. As actuarial and data science teams start to apply these tools to solve business problems, they are continually confronted with the same set of practical challenges and technological limitations. One of the key challenges is model interpretation. In this session, we will introduce two insurance-related AI applications and demonstrate how (and to what extent) we can understand the relationships captured by these complex models.

Moderator: Andy Rigby, Willis Towers Watson

Speakers: Jason Rodriguez, Lead Data Scientist, Willis Towers Watson  
Liam McGrath, Willis Towers Watson

# CONCURRENT SESSIONS

## **IET-8: Insurance On Demand — What Does it Mean for You?**

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Marina Ballroom II

It could be anything from hailing a ride to the airport, to watching an episode of *Black Mirror*, to buying a home or cyber insurance policy. Whatever “it” is, consumers increasingly expect it on demand — exactly when and how they want it, and for precisely what they’re willing to pay for it. Insurance may be more complicated than the average product on demand, but, according to a recent consumer survey conducted through the CAS, many consumers would still like it to be more simple to consume. This session combines perspectives from the chief underwriting officer of a startup that has offered insurance on demand for several years and from actuaries on the CAS Insurance On Demand Working Party. Presenters will share lessons learned from launching on-demand products, interviewing industry participants, and examining consumer survey results. Attendees will find out just how much demand there is for insurance on demand and possible ways to address it.

Moderator/Speaker: Jim Weiss, Actuary, Crum & Forster

Speaker: Michael Fitzgibbon, Chief Underwriting Officer, Slice Insurance Technologies Inc.

## **IET-9: Innovation Inspired**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Marina Ballroom III

Can Kenya’s insurance challenges learn from Cleveland? Can Melbourne’s experience speak to Madagascar? Presenters will provide information on how context can take us from incremental innovation to stepped change.

Moderator/Speaker: Jianqi (Kiki) Wang, Consultant, Willis Towers Watson

Speaker: Craig Thorburn, Lead Insurance Specialist, The World Bank

## **IET-10: The Impact of Shifts in Mobility on Insurers**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Otis

With the ridesharing industry currently at nine million users worldwide — and growing eightfold by 2030 (reaching \$285 billion) — challenges are mounting. New forms of risk that would benefit from new data are emerging: from insurance coverage and customer engagement, whether to insure a ride or car-share driver or the passengers on these trips, to the technology companies enabling mobility platforms. This session identifies the problems and offers actions for insurers to take.

Speakers: Katie DeGraaf, Consultant, Arity

Ross Reichardt, Arity

# CONCURRENT SESSIONS

## **IET-11: Resilience: The Role of Insurance**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Marina Ballroom III

In 2018 there were 394 natural catastrophe events in the U.S. that generated a total loss of \$225 billion — about 40 percent of which was covered by insurance. We are going to introduce the concept of resilience finance, how insurance can play a role in the addressing the societal costs of catastrophes and extreme weather events, and how actuaries can help.

Moderator/Speaker: Jianqi (Kiki) Wang, Consultant, Willis Towers Watson

Speaker: Rohini Sengupta, Willis Towers Watson

## **IET-12: Transformation of Underwriting through Analytics**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Otis

The exponential advancement of technology is enabling the collection of data on current and prospective customers like never before. Advanced analytics can unlock the insights from this data to enhance customer and employee experiences, as it has recently in many industries. The P&C insurance industry is behind this trend, but many leading carriers are beginning to use technology, data, and advanced analytics to transform the end-to-end underwriting process for commercial lines insurance. This session will explore some of the changes possible, including not only advancing the pricing of commercial accounts, but also business process engineering improvements through information ingestion and delivery, automated issuance, intelligent intervention, guided decision making, business intelligence and portfolio management. These capabilities can empower front-line underwriters with the insights from analytics to drive more consistent underwriting and pricing outcomes aligned with management strategies. Additionally, they can increase process effectiveness, drive down costs, and increase the ownership and accountability for portfolio growth and profit while increasing underwriting career satisfaction. Session presenters will not only examine what can be achieved, but how a team might position itself to execute.

Moderator/Speaker: Jeffery Hay, Senior Director, Willis Towers Watson

Speaker: David Ovenden, Global Director - Pricing Product Claims and Underwriting, Willis Towers Watson

## **IET-13: Using Telematics Data Beyond Pricing**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Webster

Insurance companies have embraced the use of telematics data as a means to price more accurately. There are, however, significant opportunities for insurance companies beyond the pricing application. This session will explore the potential of using telematics data to help improve the response and handling when claims happen and drive changes in driving behavior to eliminate claims before they happen.

Moderator/Speaker: Joseph Griffin, Senior Director of Customer Success, Octo Telematics

Speaker: Geoffrey Werner, Octo Advisory Inc

# CONCURRENT SESSIONS

## Modeling

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☐  **M-1: GLM I** 

**Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Hancock**

Do terms such as “link function,” “exponential family,” and “deviance” leave you puzzled? If so, this session will clarify those terms and demystify generalized linear models (GLMs). The session will provide a basic introduction to linear models and GLMs. Targeted at those who have modest experience with statistics or modeling, the session will start with a brief review of traditional linear models, particularly regression that has been taught and widely applied for decades. Session leaders will explain how GLMs naturally arise as some of the restrictive assumptions of linear regression are relaxed. GLMs can model a wide range of phenomena, including frequencies and severities as well as the probability that a claim is fraudulent or abusive, to name just a few. The session will emphasize intuition and insight in addition to mathematical calculations. Illustrations will be presented using actual insurance data.

Moderator/Speaker: Ernesto Schirmacher, Senior Actuary, Liberty Mutual Insurance

☐  **M-2: GLM II** 

**Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Hancock**

GLM I makes the case for using GLMs and some basic GLM theory, and it will be a practical session outlining basic modeling strategy. The discussion will cover topics such as overall modeling strategy, selecting an appropriate error structure and link function, simplifying the GLM (i.e., excluding variables, grouping levels, and fitting curves), complicating the GLM (i.e., adding interactions), and validating the final model. The session will also include a discussion on diagnostics that help test the selections made.

Moderator/Speaker: Ernesto Schirmacher, Senior Actuary, Liberty Mutual Insurance



# CONCURRENT SESSIONS

## **M-3: GLM III**

**Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Hancock**

This session will consider new techniques and refinements to the basic GLM that can add material value to the modeling process. It will specifically consider amendments addressing some of the purported failings of GLMs in comparison to emerging methods such as machine-learning techniques.

The session will include discussions of:

- An innovative approach to detecting subtle and higher dimensional interactions in an efficient way, potentially eliminating the need to consider alternative, harder-to-implement model forms such as nonlinear models.
- The role of such automated methods in comparison with a more manual construction of composite explanatory variables.
- Ways to mitigate the risk of over-parameterization through the use of modifications that incorporate elements of credibility within the GLM framework.
- Simple practical modeling steps that can be used to remove distortions created by combining models across claim types.
- Innovative ways of modeling bodily injury claims and other miscellaneous refinements.

Moderator/Speaker: Brent Petzoldt, JLT Re

Speaker: Marcus Deckert, Actuary R & D, Pekin Insurance

## **M-4: And the Winner Is: How to Pick a Better Model**

**Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Marina Ballroom III**

You have just finished running some data through a predictive modeling package. Now all you need to do is summarize the results, send them along, and you're done, right? Wrong. At the absolute minimum, you should understand and demonstrate the goodness-of-fit for the model. In most cases, you should also prove the constructed model provides lift over the existing rating structure. After all, what good is a new model if it cannot outperform the competition? In this session, we will explore in significant detail three often overlooked components of the modeling process: measuring goodness-of-fit, assessing lift, and internally validating a predictive model. Key topics include confusion matrices, ROC curves, Gini indices, lift charts, double-lift charts, residual plots, likelihood, penalized likelihood and deviance. Model development is usually a major investment. We should make sure our models are performing well to get the best bang for the buck.

Moderator/Speaker: Benjamin Williams, Senior Consultant, Willis Towers Watson

Speaker: Hoi Leung, AIG

# CONCURRENT SESSIONS

## ☐ **M-5: Effective Collaboration between Actuaries and Data Scientists**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Webster

With an increased focus on advanced modeling and machine learning, collaboration between actuaries and data scientist is important for project success. In this session we will share benefits, opportunities and pitfalls learned from State Farm's collaboration on various rating model projects.

Moderator: Gary Wang, Senior Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Speakers: Gus Theofanis, Senior Statistician, State Farm Insurance Companies  
Jeffrey Stoiber, Actuarial Statistician, State Farm Insurance Companies

## ☐ **M-6: Ensembles and Combining Models**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Marina Ballroom III

Ensembles are powerful analytical methods used commonly in the wider predictive analytics community outside of insurance. We'll describe the rationale and explain the effectiveness of ensembles in general, as well as the basic approaches of bagging and boosting ensembles of trees. Advantages of ensembles on insurance data will be shown and the issues surrounding complex models discussed. Finally, strategies for combining linear regression and ensemble models will be explored through a case study.

Moderator/Speaker: Christopher Cooksey, Head Actuary - Data & Analytics, Guidewire Software

## ☐ **M-7: Process Mining in P&C Insurance**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Marina Ballroom II

Insurers are continuously expanding their data analytics toolkits. One new technique is process mining, which evolved to better measure industrial processes. Today, leading insurers are using this technique to improve measurement of and provide transparency into difficult to quantify human costs, such as underwriting overhead, ULAE/ALAE, and service costs. This session provides an overview of the technique and applications.

Moderator/Speaker: Anthony Beirne, KPMG, LLP

Speaker: Jonathan Wong, Director, KPMG, LLP

# CONCURRENT SESSIONS

## **M-8: The Predictive Modeling Cooking Show**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Grand Ballroom AB

The “Predictive Modeling Cooking Show” is a window into the kitchen of master chefs as they work, except the chefs are whipping up something different: a predictive model. Join real modelers as they showcase their data engineering and modeling skills, live and on stage. Two teams will go head to head on a classic, real-world prediction problem. You’ll learn basic modeling concepts including data “scrubbing,” the basic steps used to build a model, and how to measure the effectiveness of a model. This is a great chance to gain a better appreciation of modeling concepts in a new and different way.

Moderator/Speaker: Chad Wilson, 2VP and Actuary, Travelers

Speakers: Richard Sutherland, 2VP and Actuary, Travelers  
Nathan Hubbell, 2VP - R&D, Travelers  
Megan Camanocha, Associate Actuary, Travelers  
Melissa Schenck, Associate Actuary, Travelers

## **M-9: Automated Machine Learning for Insurance Applications**

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Otis

Automated machine learning is the process of automating the end-to-end procedure that applies machine learning to real-world problems. This can include steps like data preprocessing, feature creation and selection, algorithm selection and hyper-parameter optimization. The search for the optimal modeling pipeline is typically done using genetic algorithms. We will investigate the feasibility of applying automated machine learning to real-life insurance datasets and compare the results against standard insurance modeling pipelines, such as the one using GLMs plus residual boosted trees. How much does the domain expertise matter? Can automated machine learning discover a new generally applicable modeling pipeline for insurance data? This new pipeline can also be supplemented with domain expertise, potentially leading to models that outperform those designed by hand.

Moderator/Speaker: Eliade Micu, Clyde Analytics

# CONCURRENT SESSIONS

☐  **M-10: Overview and Practical Applications of Machine-Learning Methods in Pricing – Part 1**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Douglass

The term “machine learning” covers a range of methods that can be powerful, with very practical benefits in pricing and other insurance applications. Such methods can help further improve GLM results or, more broadly, bring valuable insights to complex problems. There can also be a number of practical challenges in using these methods effectively. This is the first of two sessions reviewing a range of commonly used methods and illustrating different ways they are being applied in insurance, including some case study results. These sessions will focus on the high-level mechanics of each method and the benefits/challenges of their application, as opposed to the underlying technical details. Part 1 will focus on tree-based methods including random forests and GBMs. Part 2 will cover other popular methods including penalized regression methods and neural networks. Each part can be attended without the other.

Moderator/Speaker: Benjamin Williams, Senior Consultant, Willis Towers Watson

Speaker: Graham Wright, Senior Director, Willis Towers Watson

☐  **M-11: Overview and Practical Applications of Machine-Learning Methods in Pricing – Part 2**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Douglass

The term “machine learning” covers a range of methods that can be powerful, with very practical benefits in pricing and other insurance applications. Such methods can help further improve GLM results or, more broadly, bring valuable insights to complex problems. There can also be a number of practical challenges in using these methods effectively. This is the second of two sessions reviewing a range of commonly used methods and illustrating different ways they are being applied in insurance, including some case study results. These sessions will focus on the high-level mechanics of each method and the benefits/challenges of their application, as opposed to the underlying technical details. Part 1 will focus on tree-based methods including random forests and GBMs. Part 2 will cover other popular methods including penalized regression methods and neural networks. Each part can be attended without the other.

Moderator/Speaker: Benjamin Williams, Senior Consultant, Willis Towers Watson

Speaker: Graham Wright, Senior Director, Willis Towers Watson

☐  **M-12: Python for Actuaries** 

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Marina Ballroom III

This session will introduce the Python programming language and review some of the significant libraries that are relevant to actuaries. The session will walk through a machine learning exercise using the scikit-learn package

Moderator/Speaker: Brian Fannin, Research Actuary, Casualty Actuarial Society

Speaker: John Bogaardt, WCF Insurance

# CONCURRENT SESSIONS

□  **M-13: Sparsity Blues: How to Improve Your Predictive Model with Categorical Data** 

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Marina Ballroom IV

Linear models don't always handle categorical data well. And yet, categorical predictors are common in classification rating plans. Credibility has long been a tool which can smooth predictions across segments. This presentation will illustrate decision trees and naive Bayes as alternatives to a strict credibility-focused modeling approach.

Moderator/Speaker: Brian Fannin, Research Actuary, Casualty Actuarial Society

□  **M-14: It's Time to Replace MLE with Bayesian Shrinkage for Model Estimation** 

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Marina Ballroom IV

Fitting models by Bayesian shrinkage instead of MLE improves model accuracy (i.e., it reduces estimation and prediction variances). This previously required ad hoc approaches, but is now a systematic methodology, with clear procedures and a goodness-of-fit measure. It can be applied to most actuarial models, like regression and GLM models, and even reserve development models. This session, coming from a research project done for the CAS Ratemaking Committee, discusses the advantages of both frequentist and Bayesian shrinkage and shows how to apply them. Several classification ratemaking models are fit as illustrations. The session will be an interactive discussion. The steps to do the modeling will be set out, along with an introduction to R packages to implement it. The handouts will have more detail, including code that the attendees can use to experiment and/or modify for their own applications.

Moderator/Speaker: Gary Venter, Retired

□  **M-15: Advances in Cyberrisk Modeling** 

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Stone

Cyberrisk is an opportunity for insurers to grow their business and help society become more resilient in the face of a new threat. Eye-opening incidents such as Dyn and Wannacry illustrate the potential for catastrophic losses, but insurers remain challenged to understand how often cyber incidents can occur and how these can affect the performance of their business. As a result, cyberrisk management decisions tend to be made with limited data and too much weight is put on intuition or broad assumptions. Risk models help insurers quantify the likelihood, severity, and economic and insured financial impact of cyber incidents. In this session, you'll learn about the advances being made in the development of probabilistic cyberrisk models and how these can be leveraged to inform risk management decisions.

Moderator/Speaker: Pamela Eck, AIR Worldwide

# CONCURRENT SESSIONS

□  **M-16: The “Data” part of “Big Data”: Data Preprocessing Emerging Topics** 

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Stone

Learn the current concepts, techniques and tools relating to data preprocessing for predictive models. After introducing Hadley Wickham’s “tidy data” concept, this session will present some of the “tidyverse” packages, including tidyr and dplyr. Panelists will discuss engineering that creates new variables with more predictive ability, and they will demonstrate common dimension reduction techniques, such as using clustering, that create alternatives to class codes or medical diagnostic codes. Other cardinality reduction methods such as preprocessing categorical variables with trees will also be introduced, as well as methods such as variable transformations that are used to transform numeric data, and methods that select cut points for binning. Data used to illustrate will include a public dataset like that of loss reserving data pulled from NAIC Schedule P. The presentation will also show some of the techniques on a workers’ compensation claims data set from a modeling competition.

Moderator/Speaker: Scott Sobel, Principal, Oliver Wyman Actuarial Consulting

Speaker: Louise Francis, Consulting Principal, Francis Analytics & Actuarial Data Mining Inc.

□  **M-17: Roof Intelligence: A Complete Picture** 

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Otis

Using data to understand risk is not a new concept. However, advances in aerial imagery and machine learning now make it possible to collect even more granular and accurate data about roofs and property characteristics. Adding this new digital data to the current tabular data that has historically been used leads to a much more dynamic and complete view of property risk. This session will dig into the processes used to quantify the aerial imagery data and talk about how it can be used to develop that more complete assessment of risk.

Moderator: Howard Kunst, Chief Actuary, CoreLogic

Speakers: Tanya Havlicek, Senior Statistical Analyst, CoreLogic  
Taylor Brown, Principal Data Scientist, CoreLogic

# CONCURRENT SESSIONS

## Product Management

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### **PM-1: Implement a Strategic Early Warning Program to Mitigate Risk and Seize Opportunities**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Douglass

Does your leadership team want to avoid unpleasant surprises and identify future opportunities? If so, establishing a Strategic Early Warning program to monitor emerging competitive threats and disruptive strategies is essential for your organization to add greater business value. Such programs track specific indicators, “weak signals”, and other market forces that may impact your company’s current market assumptions and future-based scenarios. Strategic early warning programs help protect businesses against upcoming, even unexpected, market and competitive developments, and alert decision makers to critical external market shifts, allowing businesses to seize opportunities before others and minimize threats.

Moderator/Speaker: David Kalinowski, President, Proactive Worldwide, Inc.

Speaker: Jeffrey Jablonski, Market Intelligence Consultant, Erie Insurance Group

### **PM-2: Why Disrupting Insurance is Harder than it Looks**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Webster

Perhaps AirBnB did it best or maybe it was Uber, but these two companies introduced a new way of conducting very old businesses, transforming the experience where most would never think transformation was possible. So, if taxis and hotels are vulnerable, isn’t insurance? Isn’t everyone? A study of startup insurance businesses will likely reveal dissimilar ideas fail for similar reasons. This session will explore the issues you need to overcome to leave a dent in the insurance universe — not by fighting against the basics of insurance, but using them to your advantage instead.

Moderator/Speaker: David Wright, Senior Vice President and Managing Director, Beach and Associates Ltd.

### **PM-3: Pricing New Lines of Business**

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Marina Ballroom III

With the rapid changes in technology and accompanying emergence of new sources of risk, the need to be able to price new lines of business is more important than ever. But where do you start? What are the significant elements that require your consideration? This presentation will discuss various methods and approaches to develop an appropriate, reasonable premium for emerging lines of business.

Moderator/Speaker: Brian Johnson, President and Consulting Actuary, Risk International Actuarial Consulting

# CONCURRENT SESSIONS

## □ **PM-4: Product Management Insights for Entering and Exiting States/ Markets**

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Stone

During this session we will discuss product management experiences with entering or exiting states, markets, and products.

Moderator/Speaker: Bharat Govinda, Senior Vice President-Product Management, AssuranceAmerica Insurance Company

## □ **PM-5: Multi-Product Optimization: Challenges and Opportunities**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Otis

When trying to understand the customer decision making process, it is easiest for us to break the customer decisions into independent, discrete choices: “Will I renew my auto policy?” “Will I add my motorcycle this year?” “Will I cancel my homeowners policy before renewal?” These decisions are not made in a vacuum, even though that is the easiest way for us to model them. The real decision-making process is a highly complex one which takes information across multiple products into account. In this session, we will dive into the complexity of multi-product optimization. We will begin by discussing the advantages of a holistic view for customer decision modeling and then analyze the barriers to adopting a multi-product optimization strategy. Attendees will leave with a practical roadmap of steps they can follow in order to pave the way for multi-product optimization.

Moderator/Speaker: Jon Moran, Earnix

Speaker: Drew Lawyer, Manager - Predictive Modeling, COUNTRY Financial

## □ **PM-6: Actuaries as Product Managers**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Marina Ballroom I

Actuaries build numerous skills through their basic and continuing education and on-the-job training. This panel will discuss how the skills gained and experience as actuaries has helped them transition into roles in the product world.

Moderator/Speaker: Adam Tyner, Director-Pricing Strategy, Allstate Insurance Company

Speakers: Todd Witte, Manager, Deloitte

Tony Klemme, State Product Director, American Family Insurance Group



# CONCURRENT SESSIONS

## **PM-7: Development of a New Product between Two Companies — A Case Study**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Marina Ballroom II

This session will take a deep-dive look at the partnership between e2Value and Willis Towers Watson, and the recently developed product Structure Insurance Score. The score measures risk inherent to a property insurer based on several unique characteristics of a home or building — ones typically outside traditional rating characteristics. Session attendees will not only learn more about the score and its advanced uses of data analyzation, they'll learn how the companies' shared goals and innovative partnership led them to success.

Moderator/Speaker: Katey Walker, Senior Director, Willis Towers Watson

Speakers: Klayton Southwood, Senior Director, Willis Towers Watson  
Jeffrey Kucera, Consultant and Actuary, e2Value, Inc.

## **PM-8: What you are Missing: Using Vehicle-Specific Information in Auto Insurance**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Marina Ballroom IV

Advances in safety technology, such as collision avoidance systems and semiautonomous driving features, are transforming the way we drive. They are also transforming the exposure insurers face when underwriting vehicles. This session will discuss how recent developments can be used to segment an insurers' book of business to better identify those vehicles that pose a better risk. We will also discuss how a vehicle's history can impact the insurability of the vehicle.

Moderator/Speaker: Donald Hendriks, Actuary and Data Scientist, CARFAX Banking & Insurance Group

## **PM-9: Incorporating the Policyholder Perspective into Models and Analysis**

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Stone

What does it take to go from a leading role in actuarial, data science, and product management to running one of the fastest growing agencies in the Northeast? In this session, we will learn how a data scientist and product manager went about building his own agency business from the ground up, and how actuaries and modelers can use their own entrepreneurial skills to move forward initiatives in their organizations. We will also examine which aspects of the quantitative toolkit are most and least useful in the agency world, and corresponding implications for how actuaries and modelers can be effective in any nontraditional role. Finally, we will examine how a deeper understanding of the end-consumer perspective can help actuaries become much more effective in their project selection, model-building, and implementation.

Moderator/Speaker: Isaac Adams, Agency Owner, Farmers Insurance-Isaac Adams Agency

# CONCURRENT SESSIONS

## □ **PM-10: Running to Keep Up: Opportunities in Personal and Commercial Pricing**

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Marina Ballroom I

The world of insurance is moving faster than ever before with insurers and intermediaries looking to capitalize on innovative pricing approaches and modern techniques. This session will focus on some of the key concerns and opportunities insurers and intermediaries have globally and within the U.S. For personal lines, we will discuss whether topics will include price optimization is emerging again and how best to use it; the processes required to support best practice pricing in 2019; and if aggregators are going to disrupt the U.S. market as they have overseas. As for commercial lines, traditionally a neglected area for pricing innovation, insurers are increasingly focused on driving innovation within commercial lines. What should insurers be doing in 2019? Also, how can commercial lines pricing and underwriting be industrialized?

Moderator/Speaker: Benjamin Williams, Senior Consultant, Willis Towers Watson

Speaker: Neil Chapman, Senior Director, Willis Towers Watson

# CONCURRENT SESSIONS

## Ratemaking

☐  **R-1: Don't Put All Your AALs in One Basket: Event-Level Data and Pricing Catastrophic Concentration of Risk** 

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Marina Ballroom I

Insurance risk pooling seeks to spread variability across a large number of independent risks. But for insurers exposed to natural catastrophes, risks are not independent: significant dependencies may exist between individual policies; surcharges may be warranted for individual risks more correlated with an insurer's portfolio.

Although pricing for concentration of risk is a longstanding theme within historical actuarial literature, modern catastrophe simulation models have enabled considerable improvements to traditional techniques. Catastrophe models are most often used to obtain estimates of average annual losses; but other model outputs at the simulated event level are not as widely used. Actuaries can utilize these model components to measure correlations between individual risks and calculate concentration of risk charges that are more granular and accurate than ever before. Panelists will review traditional techniques for pricing the concentration charge, describe the stochastic data outputs of a catastrophe model, and provide quantitative examples of how the event-level simulation output could be used by a primary insurer to accurately reflect its reinsurance cost at the territory level. Using the quantitative methods described, this session will explore these crucial elements of risk concentration in pricing such as:

1. Assigning credibility to catastrophe model results in remote layers.
2. Ascertaining the sensitivity of certain methods to tail assumptions.
3. Developing techniques for concentration pricing with limited data.
4. Anticipating regulatory concerns for concentration pricing.
5. Determining why ideal territorial ratemaking approaches for reinsurance cost may differ from those for loss cost.

Moderator: Michael Mendel, Modernize Pricing Actuary, Zurich North America

Speakers: Victoria Gomez, Consulting Actuary, Milliman, Inc.  
Cody Webb, Consulting Actuary, Milliman, Inc.  
Tim (Chi-Fan) Wei, Actuary, Milliman, Inc.

# CONCURRENT SESSIONS

## **R-2: Insurance-Linked Securities: How to Grow Past Catastrophes When the Wind Keeps Blowing**

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Marina Ballroom II

Insurance-linked securities (ILS) markets were founded to provide property coverage against natural catastrophes. ILS markets have historically provided market leadership and stability around catastrophe events. Learn how the ILS sector has grown through two active catastrophe years and see how capital markets' capacity can support new specialty risks, such as cyber, while still meeting the needs of its original constituency. Join us for a lively discussion of how ILS capacity can complement current capacity to help clients achieve target ROE's and investors achieve attractive financial returns.

Moderator: Beth Fitzgerald, Actuary  
Speakers: Thomas Johansmeyer, AVP - Reinsurance Services, ISO  
Zachary Breslin, Vice President, Aon Securities

## **R-3: Advances in Personal Lines Risk Classification**

Concurrent Sessions 2, Tuesday, March 26, 12:30 p.m. – 1:45 p.m., Marina Ballroom II

Insurance risk classification continues to become more sophisticated and refined, fueled by enhancements in data, analytical techniques, and computing power. This session will open with a brief discussion of some recent risk classification developments that have been covered in the press. We will focus on personal lines insurance and discuss real examples of novel risk classification used in pricing and what issues the classifications aim to address, what data and techniques are used to develop these classifications, and what implementation challenges they may present. We will then examine how advances in telematics data and vehicle safety features changed and will continue to change risk classification.

Moderator: Erin Olson, Director, State Management, United Services Automobile Association  
Speakers: Ron Lettofsky, Lead Data Scientist and Actuary, Arity  
Katey Walker, Senior Director, Willis Towers Watson

## **R-4: Cluster Analysis in Loss Development**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Marina Ballroom III

In ratemaking, loss experience is typically aggregated into development triangles according to the needs of state-by-state rate filings. In loss reserving, losses are typically aggregated based on financial reporting categories. Cluster analysis can help to investigate more optimal ways of grouping the data. Cluster analysis is a collection of statistical tools designed to group similar data objects. This session will discuss useful ways to visualize the clusters and share some practical successes and challenges in applying clustering on loss development triangles. Topics include “hard” clustering such as  $k$ -means and “soft” or “fuzzy” clustering with similarities to traditional credibility theory.

Moderator/Speaker: David Clark, Munich Re America, Inc.  
Speaker: Victoria Jiang, Munich Re America, Inc.

# CONCURRENT SESSIONS

## ☐ **R-5: Workers' Compensation—State of the Market**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Stone

Beginning with an overview of the current state of the workers' compensation line, the panel will review financial results and recent trends, and discuss where the line might be headed.

Moderator/Speaker: Jay Rosen, Practice Leader and Senior Actuary, National Council on Compensation Insurance, Inc.

Speaker: Brent Otto, Vice President Actuarial & Chief Actuary, Amerisure Companies

## ☐ **R-6: Cyberrisk and Insurance: How are the Market and Rating Methods Evolving?**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Marina Ballroom IV

The relatively recent emergence of cyberrisk and corresponding cyber insurance market has presented insurers with many challenges. This dynamic new landscape meets at the intersection of cyber security efforts and traditional insurance practices. In addition to addressing insurer uncertainty in writing cyberrisk, this session will examine current progress and lessons learned from the development of a comprehensive rating plan, one that can be used by insurers and reinsurers to quantify cyberrisk.

Moderator/Speaker: Eduard Alpin, Lead Cyber Actuary, ISO/Verisk

Speaker: Joshua Pyle, Actuarial Director, CyberCube

## ☐ **R-7: Rate Deployment in a Digitally Transforming Insurance Environment**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Hancock

Insurers have the need to deploy rates, rating structures, or models in a matter of hours, not weeks or months. Deploying these items quickly to real-time production environments enables better organizational agility and nimbleness, and, in turn, a better customer experience. In this session, Earnix along with DataRobot, will explore how automating both pricing and non-pricing related models, decisions, workflows, and handoffs through analytics-based software improves the ability for insurance companies to respond to market forces. We will also look at how updating and replacing core systems as well as selecting, automating, and deploying machine-learning models can be accomplished quickly via modern software systems.

Moderator: Victoria Marciano, AVP Pricing Actuary

Speakers: Dror Pockard, Vice President-Strategy & Business Development, Earnix Ltd.  
Neal Silbert, GM of Insurance, DataRobot

# CONCURRENT SESSIONS

## ☐ **R-8: Understanding the Changing Used Vehicle Market**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Stone

The ever-changing used vehicle market has given insurers an opportunity to create a new underwriting or pricing variable. Not all used vehicles are in good condition and vehicles in poor conditions have shown to have higher loss costs. By more accurately pricing used vehicles, insurers can save one to two points on their bottom line.

Moderator/Speaker: Christopher Whipple, Red Mountain Technologies, LLC

Speaker: Daniel Pickens, Owner, DNJ Ventures, LLC

## ☐ **R-9: Practical Applications of Credibility Related to Large Account Pricing**

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Marina Ballroom I

Credibility is a simple concept but often difficult to apply in practice. This talk will discuss two applications of applying credibility to large account pricing for incorporating the excess losses and for smoothing changes over time periods. The typical approach to considering an account's experience above the basic limit is to analyze the burn costs in the excess layers directly. But burn costs in higher layers are extremely volatile and right skewed, and they do not perform well with typical credibility methods. This session will discuss an alternative approach to incorporating this information using the excess losses to modify the severity curve used to calculate the increased limit factor. We will discuss why such an approach works better for higher, volatile layers, and how it may also be easier to implement. The second part of the session will describe a method for credibility weighting changes in accounts' losses over time, with applications for profitability studies and pricing models as well. A method will be shown that incorporates random walks and related state space modeling functionality (which will be explained) within a regression framework that is robust, relatively simple, and that is designed to be suitable for presentation.

Moderator: Pamela Reale, Assistant Vice President & Actuary, The Hartford

Speaker: Uri Korn, Director - Predictive Modeling, AIG

## ☐ **R-10: Workers' Compensation Claim Frequency**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Hancock

This session will describe the relationship between changing demographics and workers' compensation claim frequency in recent years. It will also discuss other factors that may affect frequency in the near future.

Moderator: Victoria Mayen, Manager and Actuary, National Council on Compensation Insurance, Inc.

Speakers: Patrick Coate, Economist, NCCI  
Steven Weisbart, Senior Vice President and Chief Economist, Insurance Information Institute

# CONCURRENT SESSIONS

## ☐ **R-11: Auto Insurance: What Happened and What Happens Next?**

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Grand Ballroom A (Livestream)  
Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Stone

As low rates and increasing costs drove down profitability, both personal and commercial auto insurance struggled through the past decade. From the loss triangle to the balance sheet, this session will examine how both lines got caught in economic, technological, and actuarial waves; how each has struggled to regain its financial footing; and what trends will confront them in 2019 and beyond.

Moderator/Speaker: James Lynch, Chief Actuary & Vice President of Research and Education, Insurance Information Institute

Speaker: Kevin Hughes, Associate Actuarial Consultant, ISO/Verisk

## Regulation and Professionalism

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## ☐ **RP-1: Corporate Governance: Recent Development and Emerging Issues**

Concurrent Sessions 5, Wednesday, March 27, 8:00 a.m. – 9:15 a.m., Hancock

Focusing on recent developments in corporate governance standards as they relate to insurance companies, this session will cover new disclosure requirements, such as Corporate Governance Annual Disclosure, the Own Risk and Solvency Assessment requirement, and the Form F Enterprise Risk Report. The type of information that must be included in these different filings will be discussed, as will the types of best practices that regulators expect companies to have in place. Finally, insight will be provided into emerging corporate governance issues and the potential for increased federal insurance regulation.

Moderator: Rebecca Williams, Actuary, North Carolina Rate Bureau

Speaker: Fred Karlinsky, Shareholder, Greenberg Traurig, P.A.

## ☐ **RP-2: Professionalism Trivia**

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Marina Ballroom II

Presented by the Committee on Professionalism Education, this session will allow you to use your cell phones to participate in a real-time trivia game! This session will qualify for Continuing Professionalism Education credit as many questions will relate to Actuarial Standards of Practice or the Code of Conduct.

Moderator/Speaker: Rebecca Williams, Actuary, North Carolina Rate Bureau

Speakers: Fanny Paz-Prizant, RSA Canada

Kevin Groom, Actuarial Team Leader, Westfield Insurance

# CONCURRENT SESSIONS

## □ **RP-3: People are from Earth, Actuaries are from Neptune: The Habits of Effective Actuarial Communications**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Webster

Actuaries are renowned for quantitative skill, attention to detail, and highly complex analysis. However, the effectiveness of an analysis and the actuary who created it, depends on the actuary's ability to provide clear technical communication to technical and nontechnical audiences. While effective communication is a vital skill for actuaries, it can become more challenging as our methodologies and calculations grow more complex and sophisticated. Tools like Excel are versatile and powerful, but a badly designed spreadsheet can make your work harder to check for errors, difficult for another actuary to review, and inefficient to reproduce and update in the future. Additionally, actuarial rate exhibits often fail to comply with the documentation requirements prescribed by our standards of practice. This session will explore best practices for technical actuarial communications. It is for actuaries who wish to create bulletproof quantitative exhibits and reports that can withstand the scrutiny of regulators, company executives, and other actuaries.

Moderator/Speaker: Andrew Pai, Associate Actuary, Milliman, Inc.

Speaker: Max Mindel, Principal, Milliman, Inc.

## □ **RP-4: Keeping Up with the Cat Models**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Marina Ballroom II

The impact of extreme weather has been felt throughout the world, and insurers, regulators, and legislators are increasing their attention to risk stemming from natural catastrophes. Specifically, recent destruction resulting from wildfires in the Western United States and flooding in coastal states has left these parties searching for answers. Little historical experience renders actual claims data largely irrelevant for catastrophe ratemaking. Confounding factors such as urban development and climate change have also increased the hazardous exposure in ways that the historical data cannot capture. Consequently, catastrophe models are now more important than ever. While catastrophe models for hurricanes have been in use for years, models for wildfire and flood are changing rapidly. For these perils, actuaries may find themselves working with models with less documentation, testing, and validation than with more mature models. Using ASOP 38, we will offer a practical framework to effectively review flood and wildfire models in spite of the unique characteristics of these perils. We will explore how these models can be incorporated in personal lines ratemaking.

Moderator: Margaret Brinkmann, Actuary, Milliman, Inc.

Speakers: Gregory Dietzen, Actuary, Milliman, Inc.

Eric Xu, Actuary, Milliman, Inc.



# CONCURRENT SESSIONS

□  **RP-5: Professionalism, Pricing and Predictive Modeling: The Next Generation**

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Webster

Predictive modeling has increasingly been included in many actuaries' job descriptions and actuaries are often asked for their opinions on issues that relate to professional ethics — hether building predictive models, utilizing them as inputs to the pricing decision-making and implementation process with business partners, or supporting them in rate filings. This session's interactive format remains the same as in previous RPM seminars, but the scenarios have been refreshed. We will look to the future of predictive modeling and pricing as we discuss situations that touch on common issues related to the Code of Conduct, Statement of Principles, and Standards of Practice. Audience participation is highly encouraged.

Moderator/Speaker: Madeline Main, Willis Towers Watson

Speaker: Richard Sutherland, 2VP and Actuary, Travelers

# CONCURRENT SESSIONS

## □ **RP-6: Regulatory Perspectives in Ratemaking and Pricing: Something Old, Something New**

Concurrent Sessions 1, Tuesday, March 26, 10:15 a.m. – 11:30 a.m., Marina Ballroom I

Concurrent Sessions 7, Wednesday, March 27, 11:15 a.m. – 12:30 p.m., Douglass

You, the audience, will have the opportunity to select our session's discussion topics! Hear from a panel of three eminent regulatory actuaries who are active in the ratemaking and pricing realm. The panel will discuss how they and their states view current burning issues. These topics may include:

- Predictive modeling/GLMS as used in pricing and underwriting in general
- Pricing that incorporates policy renewal expectations/use of retention models
- Other price optimization topics
- Usage-based insurance (UBI)
- Controversial/proxy rating variables
- Machine learning and big data
- Role of actuaries vs. data scientists
- Role of regulators vs. companies vs. consultants
- Confidentiality of proprietary models
- Catastrophe modeling as used in pricing
- Capping (of premium/rates/rate changes) and other renewal pricing topics
- Other topics suggested by the audience

Moderator/Speaker: Lisa Chanzit, Senior Consulting Actuary, Risk & Regulatory Consulting, LLC.

Speakers: Lawrence Steinert, Senior Property & Casualty Actuary, Louisiana Department of Insurance

Wanchin Chou, Chief Insurance Actuary, State of Connecticut Insurance Dept.

Cara Blank, Property Casualty Actuary, Massachusetts Division of Insurance

# CONCURRENT SESSIONS

## **RP-7: Lights! Camera! Action!**

Concurrent Sessions 6, Wednesday, March 27, 9:30 a.m. – 10:45 a.m., Otis

The Committee on Professionalism Education will present a new round of skits! The skits are a fun way to demonstrate how you can use professionalism in practice. Audience participation is encouraged! This session will earn continuing professionalism education credits.

- Moderator/Speaker: Michael Chen, Consulting Actuary, Pinnacle Actuarial Resources, Inc.
- Speakers: Peter Royek, Senior Vice President & Actuary, Toa Reinsurance Company of America  
George Levine, Director, KPMG, LLP  
Mary Hosford, Chief Health Actuary, Massachusetts Division of Insurance

## **RP-8: The Regulatory Response to Insurtech**

Concurrent Sessions 3, Tuesday, March 26, 2:15 p.m. – 3:30 p.m., Marina Ballroom I

Regulation presents both a hurdle and useful input to the development and acceptance of insurance technology. The National Association of Insurance Companies (NAIC) and state regulators have put much effort into assessing a constructive regulatory response. The session discussion will be centered on topics such as price optimization, use of big data in fraud detection or claim settlement amounts, and regulator treatment of complex pricing algorithms in rate filings (where the regulator may not have expertise to evaluate).

- Moderator: Craig Allen, Consulting Actuary, Craig A. Allen
- Speakers: Peter Kochenburger, Executive Director - Insurance Law LL.M. Program, University of Connecticut  
Elizabeth Dwyer, Deputy Director and Superintendent of Financial Services, State of Rhode Island Business Regulation

## **RP-9: Big Data and the Role of the Actuary**

Concurrent Sessions 4, Tuesday, March 26, 4:00 p.m. – 5:15 p.m., Marina Ballroom IV

The use of big data and new analytical techniques is disrupting established practices, procedures, and markets in the highly regulated insurance industry. This session will cover current and emerging practices, regulatory considerations, and professional issues related to big data and insurtech, and it will review the American Academy of Actuaries Big Data Task Force recently released monograph, “Big Data and the Role of the Actuary.” Actuaries, who must comply with the Code of Professional Conduct and the actuarial standards of practice, will need to be aware of these issues as they help their companies and clients navigate through this changing environment.

- Moderator: Steven Groeschen, Chief Consulting Actuary and Risk Analyst, Demotech, Inc.
- Speakers: Robert Miccolis, Principal, Miccolis Consulting LLC/Strategy Advisor to the CAS Institute  
Dorothy Andrews, Chief Behavioral Data Scientist, Insurance Strategies Consulting, LLC

