March 13–15, 2023
Loews Coronado Bay Resort
Coronado, CA / Bay Front San Diego

Ratemaking, Product and Modeling Seminar

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Overview

General Information

For more information on the following, please consult the RPM website, rpm.casact.org or the RPM app on your smartphone.

Consent to Use of Photographic Images

Participation at RPM constitutes an agreement by the registrant for the CAS to use photographic images and other images. Please see the RPM website (rpm.casact.org) for details.

Antitrust Notice

The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. The full CAS Antitrust Compliance Policy (http://bit.ly/20UMw6Z) clarifies prohibited activities and responsibility of all attendees.

Code of Conduct

The CAS is dedicated to providing a harassment-free conference experience for everyone. Registration and attendance at CAS meetings, seminars, webinars and other activities constitutes an agreement to our Code of Conduct. The full Code of Conduct (rpm.casact.org/attend) clarifies prohibited activities and responsibility of all attendees.

Speaker Opinions

The opinions expressed by speakers at this event are their own and do not necessarily reflect the positions of the CAS.

Wireless Access

Attendees of the RPM Seminar have access to complimentary Wi-Fi throughout the hotel.

Network: LCBR_Meetings
Password: pinnacle

Download the CAS Meeting App

More detail about the sessions and speakers is found on the CAS Meeting app. All sessions will be recorded (simultaneously audio, slides), except where indicated.

Key to Complexity of Sessions

Basic.
No prior knowledge of the subject matter is assumed. Little or no technical content.

Intermediate
General knowledge of the subject matter is assumed. Moderate technical content.

Advanced
Working knowledge of the subject matter is assumed. Moderate to highly technical content.

☐ Checkbox for Personal Attendance Record

🎤 Non-Recorded Session

▶ Livestreamed Session

Tracks by Code

Workshops	WS
Roundtable	RT
General Session	GS
Ratemaking	R
Product/Innovation	PI
Modeling	M
Professionalism and Regulation	PR
Wildfire	WF

Schedule at a Glance

Please note all times are Pacific Time

Sunday, March 12
3:00 PM - 4:30 PM   Workshop Registration*..Atrium (Lobby Level)

Monday, March 13
7:15 AM - 3:45 PM   Workshop Registration*..Atrium (Lobby Level)
7:00 AM - 8:00 AM   Workshop Breakfast*.. Commodore Foyer
8:00 AM - 5:00 PM   iCAS Community of Practice Event* .... Commodore B
8:00 AM - 5:00 PM   Full-Day Workshop*..Aurora
8:00 AM - 12:00 PM   Half-Day AM (Morning) Workshops* .... Britannia, Cambria, and Sovereign
10:00 AM - 10:30 AM   Workshop Refreshment Break* .... Commodore Foyer
12:00 PM - 1:00 PM   Workshop Luncheon* ....Bay Terrace
1:00 PM - 5:00 PM   Half-Day PM (Afternoon) Workshops*...Britannia, Cambria, and Sovereign
3:00 PM - 3:30 PM   Workshop Refreshment Break* .... Commodore Foyer
3:45 PM - 6:30 PM   RPM Seminar Registration..Atrium (Lobby Level)
3:45 PM – 6:30 PM   Attendee Lounge.. Commodore A
5:30 PM - 6:30 PM   Welcome Reception with Exhibits.. Commodore A/Foyer

* Separate Workshop Registration Required

Tuesday, March 14 — Happy Pi Day!
7:00 AM – 4:45 PM   RPM Seminar Registration..Atrium (Lobby Level)
7:00 AM - 5:00 PM   Student Program ....Avalon
7:00 AM - 8:00 AM   Seminar Breakfast with Exhibits.. Commodore A/Foyer
7:00 AM – 4:45 PM   Attendee Lounge.. Commodore A
7:00 AM - 8:00 AM   Roundtable Discussions .... Aurora, Britannia, Cambria, and Sovereign
8:00 AM - 10:00 AM   Opening Business Session/iCAS Recognition/Featured Speaker
                     GS-1: All Hands on Deck: Risk Management and the US Navy....................................... Commodore CDE
10:00 AM - 10:30 AM   Seminar Refreshment Break with Exhibits... Commodore A/Foyer
10:30 AM - 11:45 AM   **Concurrent Sessions 1**
11:45 AM - 12:00 PM   Stretch Break/Walk to Lunch ....Pavilion
12:00 PM - 1:30 PM   Seminar Luncheon ....Pavilion
1:30 PM - 2:45 PM   **Concurrent Sessions 2**
2:45 PM - 3:30 PM   Seminar Refreshment Break with Exhibits... Commodore A/Foyer
3:30 PM - 4:45 PM   **Concurrent Sessions 3**
5:30 PM - 6:30 PM   Pi Day Dinner Meet Ups ....Atrium (Lobby Level)
6:30 PM - 8:30 PM   Movie Screening of "Elemental" (RPM Seminar Attendees Only) .... Commodore E

Wednesday, March 15
7:00 AM - 3:30 PM   RPM Seminar Registration..Atrium (Lobby Level)
7:00 AM - 8:00 AM   Seminar Breakfast with Exhibits.. Commodore Foyer
7:00 AM - 8:00 AM   Roundtable Discussions .... Avalon, Britannia, Cambria, and Commodore CD
7:00 AM – 3:30 PM   Attendee Lounge.. Commodore A
8:00 AM - 9:15 AM   **Concurrent Sessions 4**
9:15 AM - 9:45 AM   Seminar Refreshment Break with Exhibits... Commodore A/Foyer
9:45 AM - 11:00 AM   **Concurrent Sessions 5**
11:00 AM - 12:15 PM   Seminar Box Lunch... Commodore Foyer
12:15 PM - 1:30 PM   **Concurrent Sessions 6**
1:30 PM - 1:45 PM   Transition Break with Exhibits.. Commodore A/Foyer
1:45 PM - 3:15 PM   Closing General Session
                     GS-2: IP (Inflationary Pressure)! IP (Industry Panel)! Hooray? .... Commodore E

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GOLD

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Sponsors and Exhibitors

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DW Simpson is an actuarial and analytics recruiting firm. Our recruiters work with actuaries from Entry Level through Fellowship in all disciplines including Property & Casualty, Life, Health, Pension, and Non-Traditional actuarial jobs. In addition, if you need to add to your team, our recruiters can help facilitate your search.

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iCAS Data Science & Analytics Forum - General
Commodore B

❑ **iCAS: iCAS Data Science & Analytics Forum**

This forum is designed for advanced practitioners working in the areas of data science and analytics. The full-day event includes presentations, roundtable discussions, and opportunities for interaction with fellow colleagues interested in predictive analytics. Typical topics included in this forum include presentations and discussions around traditional modeling, machine learning, data tools, deployment methods, and ethical concerns. Please see the current year's agenda for more detailed information. All content is designed to be relevant for CSPA continuing education requirements.

iCAS LRMoE
Monday, March 13, 8:30 AM - 9:45 AM

❑ **iCAS-1: The Logit-weighted Reduced Mixture of Experts (LRMoE) - A flexible modeling tool for actuarial applications**

In ratemaking and stochastic claim reserving in Property and Casualty (P&C) insurance, it is critical to understand the effect of policyholders' risk profiles on the frequency and the severity of claims, the dependence structure among various business lines and the claim distributions. To include all the above features, it is essential to develop a flexible regression model which is theoretically justified and computationally tractable. To that purpose, we propose the class of Logit-weighted Reduced Mixture of Experts (LRMoE) models for multivariate claim frequencies or severities distributions.

In the first part of the talk, we investigate some of the properties that the LRMoE class possesses, via comparisons with the classical Generalized Linear Model (GLM) that is mainly used in actuarial practice. We present a live demonstration on how to use our R and Julia packages to fit the LRMoE class, on simple toy examples. We further discuss different industry applications where actuaries can benefit by the use of the LRMoE distributions. We conclude our presentation with an insurance real data study with direct application to claim reserving. Making use of the LRMoE class and simple results from sampling theory, we discuss a simple extension of the classical chain ladder reserving method by including policyholders' covariate information.

Speakers:	Andrei Badescu, Associate Professor, University of Toronto
	Ian Weng Chan, University of Toronto

iCAS Data Governance Roundtable
Monday, March 13, 10:00 AM - 11:00 AM

❑ **iCAS-2: Data Governance: From Framework to Implementation Roundtable**

In this Roundtable, we will review how data governance is defined in the context of different organizations and what challenges are faced by the Insurance industry. After reviewing a comprehensive framework, we will explore how insurance companies could implement it successfully.

Speaker:	Yoram Gilboa, Director of Pricing, IFG Companies

iCAS Penalized Regression
Monday, March 13, 11:00 AM - 12:15 PM

❑ iCAS-3: Penalized Regression and Credibility Applications

One common barrier to employing GLM or GAM modeling is the lack of sufficient data. This limitation often comes from the combination of the considerations in ASOP No. 25 "Credibility Procedures" and the fact that GLMs assign full credibility to the data. In this session, we will explore the possibilities of credibility-based regression by expanding the intended purpose of modeling analysis from producing a single model as output to producing data insights, credible differences, and a range of reasonable models.

Speaker: Thomas Holmes, Head of Actuarial Data Science US, Akur8

iCAS LDA Topic Modeling Python
Monday, March 13, 1:15 PM - 2:30 PM

❑ iCAS-4: Latent Dirichlet Allocation (LDA) Topic Modeling in Python

Valuable data that could be used for business insights and decision-making is often only available in free form text fields. This presentation will review one method of converting text to more usable information by using Latent Dirichlet Allocation (LDA) topic modeling. This discussion will include an overview of where this method was applied to voicemail transcripts to quantify the most common reasons claims participants call claim representatives, with the results helping to prioritize IT investment in building out self-service functionality.

Speaker: Denise Christophel, Director Advanced Analytics, Sentry Insurance

iCAS GitHub Tutorial
Monday, Mar 13, 3:30 - 5:00 PM,

❑ iCAS-5: Hands-on git/GitHub Tutorial

In this tutorial session, Raj and Brian will cover the basics of using version control with git and GitHub. You will understand the business case for introducing these tools into your actuarial workflow and how to get started. You will learn how git differs from other backup and change management procedures and the benefits this offers. You will then learn how to arrange a set of files, start making and tracking changes, and document the evolution of your work. Finally, you will push your work to the cloud and see how your contributions are visible and accessible to others.

Attendees should bring their laptops, with git installed and ready to use. Attendees will find it beneficial to watch the microlearning series on git and GitHub.

Moderator/Speaker: Brian Fannin, Research Actuary, Casualty Actuarial Society
Speaker: Rajesh Sahasrabuddhe, Partner, Oliver Wyman Actuarial Consulting

Workshop - Full Day

Monday, March 13, 8:00 AM - 5:00 PM, Aurora

☐ ☀ ☀ **WS-1: Building GLM/GBM Using R**

The GLM portion of the workshop will focus on the specification, interpretation and validation of GLMs. It will be conducted in the R language. The session will begin with a basic introduction (or refresher) on GLM theory, and then dive into the practice of model building with the goal of constructing an insurance rating plan. Working with a real-life data set, participants will work through the steps of exploratory data analysis, data splitting, iterative model selection and specification, and model validation, with a focus on interpretation and insight. All datasets and R code will be distributed to attendees prior to the seminar.

The GBM portion of the workshop will introduce modeling with Gradient Boosting Machines (GBM) and lead the attendees through simulated and real data exercises. Through a combination of lectures and hands-on exercises, we aim to develop familiarity with the concepts behind the GBM algorithm. The exercises will include practice in tuning hyperparameters and evaluating models. A significant amount of time will be spent running through real life exercises together for both the classification and the regression situation. The workshop will be conducted exclusively in the R language.

Learning Objectives:

1. Learn how to create GLM and GBM models in the R language including tasks such as variable selection, model diagnostics, and model validation.

2. Understand the differences between linear regression, GLM, and GBM and learn how to choose amongst these tools for their specific modeling situation.

3. Learn how to analyze the results from their GLM or GBM models and extract insights relevant to their modeling objective.

Speakers: Mark Goldburd, Consulting Actuary, Milliman

Manyi Luo, Consulting Actuary, Milliman

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

Marcus Deckert, Carfax

Workshop - Half Day Morning

Monday, March 13, 8:00 AM - 12:00 PM, Britannia

❏ ☼ **WS-2: Basic Ratemaking**

This workshop will explain the fundamental insurance equation: the foundation of the ratemaking process.

The first session of the workshop will include techniques for adjusting historical data to estimate its various components, premiums, losses, expenses, and profit, in the relevant pricing time period. The session will conclude by briefly exploring other considerations company management should make, along with the cost-based rate indication derived from the fundamental insurance equation, to determine what rates to charge in practice.

The second session of the workshop will examine the various methods that actuaries use to allocate overall average rates to various subdivisions of a line of business, including territories, classifications, and tiers. Some of the methods discussed will consist of univariate, multivariate, and generalized linear modeling techniques.

Learning Objectives:

1. Gain an understanding of the role and importance of each major component of the actuarial work supporting a rate change indication as well as the actuarial language used to discuss and analyze rate reviews.

2. Gain an understanding about the functions and features of a risk classification system by reviewing relevant ASOPs and through examples.

3. Gain an understanding of rate relativities, common methods used to find them, and related issues when implementing them through examples.

Speakers: Nickolas Alvarado, Milliman

Kevin Hughes, Associate Actuarial Consultant, Verisk Underwriting Solutions

Monday, March 13, 8:00 AM - 12:00 PM, Cambria

❏ ☼ ☼ **WS-3: Catastrophe Modeling and Pricing**

This workshop will cover the following topics:

• Different types of catastrophe models and their main use cases

• How to spot the various strengths and weaknesses of models

• Pricing example / interactive use case development of catastrophe rates

Learning Objectives:

1. Learn to match the various Catastrophe model types with their proper use cases.

2. Demonstrate proper use of catastrophe models, while maximizing the strengths of what the models can do.

3. Learn how to properly account for catastrophe risk in developing new rate plans.

Moderator/Speaker: Howard Kunst, Chief Actuary, CoreLogic

Speakers: Chad Karczewski, Actuarial Analyst, Milliman

Heather Kanzlemar, Actuary, Milliman

Minchong Mao, Aon

Monday, March 13, 8:00 AM - 12:00 PM, Sovereign

❑ ☀ ☀ **WS-4: Dynamic Personal Auto Simulation**

The Dynamic Personal Auto Simulation Model simulates the changes in growth and profitability of a company's personal auto book in a competitive market. The model was built to train emerging managers to compete against other insurers to obtain a profitable book. The model pits four teams (insurers) against each other over a period of three trials where each insurer must choose how to make rate changes of their existing personal auto book of business to both grow and remain profitable.

Attendance will be limited to 24 attendees.

Learning Objectives:

1. Foster collaboration and communication within the group to achieve group goals.

2. Learn competitive and strategic thinking to implement rate changes based on actuarial study

3. Experience financial planning in a dynamic marketplace

Speakers: Nick Weltmann

Lijuan Zhang, Global Manager of Pricing and Portfolio Management, Individual Personal Insurance, AIG

Workshop - Half Day Afternoon
Monday, March 13, 1:00 PM - 5:00 PM, Britannia

❑ ☀ ☀ **WS-5: Advanced Ratemaking**

Sometimes basic actuarial ratemaking techniques are insufficient for the job at hand. Data availability, the underlying nature of the exposure, or the presence of other constraints can necessitate the use of additional or more advanced methodologies. This workshop will cover advanced ratemaking topics such as pricing for new products, competitor analysis, and large account pricing. This session will be structured as two modules. During the first module, we will provide an interactive case study challenging participants to use their creativity in setting the rates for a new product, and we will walk through an example of how to perform a competitive analysis. The second module will introduce the basic mechanics and common challenges of employing loss rating techniques to determine pricing for a risk based on the insured's own experience. Armed with the basics, we will challenge ourselves to make practical decisions about account pricing from the perspective of the broker, underwriter, and actuary.

Learning Objectives:

1.   Understand the process for pricing new products and conducting competitor analysis.

2.   Understand practical applications of large account pricing.

3.   Explore implications of the actuary's role as a strategic business partner.

Speakers: Jennifer Beers, VP & Actuary, Chubb

Taralyn Slusarski, Deloitte Consulting LLP

Brekk Hayward, Actuarial Analyst, Milliman

Katherine Pipkorn, Consulting Actuary, Milliman

Monday, March 13, 1:00 PM - 5:00 PM, Cambria

❑ ⁂ WS-6: Product Management/Development

Participants of this workshop will learn how functional areas within an insurance organization work together to make the best decisions for the organization.

We will take a hands-on approach to the insurance product life cycle, focusing on three different scenarios - building a new product, expanding a product to a new market, and overhauling an existing product. The workshop will be led by industry professionals with decades of experience developing, implementing, and improving products.

Learning Objectives:

1. Tentative: Attendees will better understand the product management lifecycle.

2. Tentative: Attendees will understand how multiple functional areas integrate for making company decisions.

Moderator:	Don Hendriks
Speakers:	Dan Post, Chief Actuary, Mutual Capital Analytics
	Andy Montano, Personal Lines Director, NCRB
	Paul Anderson, Principal & Consulting Actuary, Milliman

Monday, March 13, 1:00 PM - 5:00 PM, Sovereign

❑ ⁂ ⁂ WS-7: Text Analysis for Beginners Using R/Python

Attendees will experience a hands-on introduction to the use of natural language processing for textual analysis with the most common R and Python packages. It will demonstrate steps in the process including pre-processing and preparing text data, foundational algorithms and results visualization. The code examples will be provided with an emphasis on foundational skills to enable independent exploration after the conference.

Learning Objectives:

1. Define text mining-related terminology.

2. Organize unstructured text data into structured formats for analysis.

3. Gain insight from text data through foundational natural language processing algorithms.

Speakers:	Liam McGrath, Data Scientist, Willis Towers Watson
	Yelena Kropivnitskaya, The Wawanesa Mutual Insurance Company

Keynote – General Session 1

Tuesday, March 14, 8:00 AM - 10:00 AM, Commodore CDE

❑ ⚙ **GS-1: All Hands on Deck: Risk Management and the US Navy**

Whether you sit at a desk in an office on dry land or serve our country aboard a naval carrier far from shore, effective risk management is vital to success. Similar to the insurance industry, the US Navy aims to foster a proactive culture of excellence that encourages risk management, problem-solving and critical thinking. During this session, Admiral Bird will discuss how the US Navy uses effective risk management at all levels within the Department of the Navy.

Learning Objectives:

1. Identify and understand the components of effective risk management.

2. Explore the risks faced by the US Navy and how the Navy employs its Risk Management framework to set themselves up for success.

3. Evaluate potential approaches to case studies where risk management plays a vital role.

Moderator: Kathleen Ores Walsh

Speaker: John Bird, Senior Vice President of Military Affairs

Closing — General Session 2,
Wednesday, March 15, 1:45 PM - 3:15 PM, Commodore E

❑ ⚙ **GS-2: IP (Inflationary Pressure)! IP (Industry Panel)! Hooray?**

In the aftermath of COVID-19, the economy has been facing inflationary pressures that impact all types of ratemaking! Our panel of experts from across the Property & Casualty Industry will explore inflationary pressures in our industry, touching on Workers Compensation, Reinsurance, and Social Inflation!

Learning Objectives:

1. Learn industry perspectives on how inflation is impacting colleagues in their area of expertise.

2. Compare the impacts of inflation across various types of business.

3. Understand how Social Inflation interacts with Property and Casualty lines of business.

Moderator: Rebecca Williams

Speakers: Stephanie Rabin, SVP and Chief Strategy Officer at Holborn Corporation

                    Jim Lynch, James Lynch Casualty Actuary

                    Sean Cooper, Executive Vice President & Deputy Chief Actuary, WCIRB California

Roundtables

Tuesday, March 14, 7:00 AM - 8:00 AM, Britannia

❑ ☀ **RT-1: Challenges in Florida**

The Florida homeowners market is in a state of crisis after several years of worsening results. 2021 and 2022 saw multiple insolvencies, tightening underwriting standards, withdrawals of several carriers from the market, skyrocketing rate levels, a tight reinsurance market and extraordinary growth in Citizens Property Insurance Corporation, the insurer of last report. In this roundtable, we will have open discussion about the challenges in the Florida homeowners market and the outcome of the special session that took place in mid-December, including details of Senate Bill 2A, which was signed into law by Governor Ron DeSantis.

Moderator/Speaker: Klayton Southwood, Senior Director, WTW

Tuesday, March 14, 7:00 AM - 8:00 AM, Cambria

❑ ☀ **RT-2: Nifty R Scripts**

While statistical languages such as R are essential for predictive modeling and other advanced methods, actuaries are increasing integrating R into their workflows for traditional analyses, such as reserving and ratemaking, to automate data tasks or to enhance or replace Excel-based models. Several R packages, such as ChainLadder and actuar, have been developed to implement actuarial methods. Let's discuss our experiences working with R in the 'traditional' actuarial context – what challenges, benefits, and best practices have we identified? Which R packages and scripts are the 'niftiest'? Attendees with any level of R experience are encouraged to drop by.

Facilitator: Mark Goldburd, Consulting Actuary, Milliman

Tuesday, March 14, 7:00 AM - 8:00 AM, Aurora

❑ ☀ **RT-3: Leading Small Actuarial Departments**

This group discussion will focus on the pros and cons of leading a small actuarial department with the focus on mitigating the cons. It will discuss the many hats actuaries may wear, shopping for resources, and increasing influence in their companies.

Facilitator: Kimberley Ward, VP, Pricing EA/Healthcare, Arch Insurance Group

Tuesday, March 14, 7:00 AM - 8:00 AM, Sovereign

❑ ☀ **RT-4: Inflation and Covid- Complications for Pricing Analysis**

The pandemic has lengthened claim settlement times and temporarily reduced incidence of losses. At the same time a historic spike in inflation has occurred. The pandemic distortions make it challenging to observe the true impact of inflation on claims payments. This roundtable will discuss these issues and the approaches to adjusting pricing analyses accordingly.

Facilitator: Chris Gross, CEO, Cognalysis

Roundtables (RT)

Wednesday, March 15, 7:00 AM - 8:00 AM, Britannia

❑ ☀ **RT-5: Data for Wildfires**

This interactive session will pick our actuarial brains to construct a "wish list" for wildfires. Examples include the kind of data will be helpful for carriers/regulators/homeowners, what should be done on public policies and insurance regulations, and what are the most pressing needs right now.

Facilitator: Yinpok (Robert) Lee, Milliman

Wednesday, March 15, 7:00 AM - 8:00 AM, Cambria

❑ ☀ **RT-6: Professionalism Code of Conduct Case Studies**

In this interactive session, we will discuss the CAS Code of Conduct and apply it to several different business scenarios. Discussion will include which parts of the Code of Conduct would apply to the situations, and what steps to take if you feel you or another CAS member is having trouble interpreting the Code of Conduct.

Facilitator: Ken Williams, Staff Actuary, Casualty Actuarial Society

Wednesday, March 15, 7:00 AM - 8:00 AM, Avalon

❑ ☀ **RT-7: Actuaries in Tech Round Table**

A round table discussion among actuaries working in the technology space, by Actuaries at Tech companies, InsurTech companies, and innovation areas of traditional insurers. Actuaries outside of those roles both with interest in them are encouraged to attend as well.

Learning Objectives:

1. Demonstrate compliance hurdles commonly encountered when starting an insurance carrier or MGA/MGU.

2. Describe actuarial roles beyond traditional insurance carriers and insurance consulting.

3. Apply new technology to traditional actuarial roles.

Facilitators: Kevin McBeth, Coherent

Kathryn Koch, Consulting Actuary, Lewis & Ellis, Inc.

Wednesday, March 15, 7:00 AM - 8:00 AM, Commodore CD

❑ ☀ **RT-8: Flood**

Join the conversation on Flood – topics may include new laws in Florida, Risk Rating 2.0, and/or discussion of the developing private insurance market!"

Facilitator: Rebecca Williams, Actuary, North Carolina Rate Bureau

Modeling (M)

Concurrent Sessions 1, Tuesday, March 14, 10:30 AM - 11:45 AM, Commodore B

❑ ◎ ◎ **M-1: The Practical Impact of Credibility Models**

Penalized regressions such as Lasso and Elastic Net are becoming part of the standard toolkit for modelers and actuaries. The original adoption of penalized regression can be traced back to its appealing theoretical properties, such as the ability to blend GLM with credibility assumptions and better predictive power. When these methods are adopted for insurance modeling, they allow an actuarial modeler to intuitively see the relationships between penalization, credibility, parsimony, and stability. After a brief theoretical overview, this session will cover how and why these new techniques are being adopted by the industry from a modeler's practical perspective.

Learning Objectives:

1. Support penalized regression techniques from both an academic and practical perspective
2. Compare penalized regression techniques with standard actuarial credibility approaches
3. Describe the effects that penalization will have on the stability of GLMs

Moderator:	Steven Phillips
Speakers:	Thomas Holmes, Head of Actuarial Data Science US, Akur8
	James Riley, Senior Actuarial Assistant, Allstate Insurance Company
	Jake Falandays, Hippo Insurance

Concurrent Sessions 2, Tuesday, March 14, 1:30 PM - 2:45 PM, Commodore B

❑ ◎ ◎ **M-2: Penalized Regression Between Credibility and GBMs**

Penalized regression is steadily becoming a standard approach when building models for ratemaking. Furthermore, applying machine learning to penalized regressions creates a versatile framework that can replace many currently manual processes in an automated way. First, this session will show how penalized regressions are effectively versions of standard credibility approaches. This application of credibility allows a modeler to reduce overfitting and improve a model's ability to generalize. Additionally, we will see how penalized regression can borrow some of the benefits of GBMs without also inheriting the GBM's black-box nature and lack of interpretability. Since penalized regressions are built upon standard GLM modeling, incorporate credibility procedures, and can take on some of the benefits of GBMs, this presentation aims to show that penalized regression is a powerful and interpretable replacement for both standard GLMs and GBMs in insurance modeling.

Learning Objectives:

1. Describe the penalized regression framework.
2. Recognize the equivalence between Credibility and Penalized Regression via Bayesian models.
3. Compare and contrast Penalized Regression with Black Box modeling techniques.

Moderator:	Steven Phillips
Speakers:	Guillaume Beraud-Sudreau, Chief Actuary & Co-founder, Akur8
	Mattia Casotto, Head of US Product, Akur8

Concurrent Sessions

Concurrent Sessions 4, Wednesday, March 15, 8:00 AM - 9:15 AM, Commodore E

❏ ⚙ M-3: Advanced Machine Learning in Real Life

Prior to a rate change implementation, it is common for pricing actuaries, product managers and other insurance leaders to compare various rate scenarios and choose the one that best aligns with business objectives and regulatory considerations. However, to fully understand the impact of a rate change on a book of business, customer demand should be considered. This session will discuss how advances in machine learning are being made to better solve these types of insurance problems. This will be a dynamic and interactive session where the audience will be able to provide guidance on model design and rate impact selection to see how all these pieces fit together.

Learning Objectives:

1. Understand the basics of AGLM and Layered GBMs.

2. Understand the variables one might consider when comparing rate change scenarios.

3. Understand how different considerations can be incorporated into the rate change decision-making process through the use of Machine Learning.

Moderator:	Gary Wang
Speakers:	Michael Chen, Director, WTW
	Serhat Guven, Managing Director, Willis Towers Watson

Concurrent Sessions 5, Wednesday, March 15, 9:45 AM - 11:00 AM, Cambria

❏ ⚙ ⚙ M-4: Mixture-of-Experts Models for Claim Frequency and Severity

Generalized linear models have been widely used for regression modelling in property and casualty insurance, but they may perform quite poorly when real data exhibit behaviours that violate their underlying assumptions, such as excessive zeros, multimodality and heavy tails. In this presentation, we introduce a new open-source statistical software tailor-made for actuarial applications which allows actuarial practitioners to model and analyze insurance loss frequency and severity using a nonlinear multivariate regression model. The model is very flexible, and it can fit any type of positive dataset, capture the dependency structure implied by the data, and is statistically implementable. Several distinctive features are included which cannot be achieved using existing software packages, including a wider coverage on frequency and severity distributions and their zero-inflated versions, parameter estimation under data censoring and truncation, and a collection of insurance ratemaking and reserving functions. The packages also provide several model evaluation and visualization functions to help users easily analyze the performance of the fitted model and interpret the model in insurance contexts. The presentation also contains a demonstration of how to use our software to analyze a real insurance dataset.

Learning Objectives:

1. Understand the modelling framework of Logit-weighted Reduced Mixture-of-Experts (LRMoE) and its applicability to insurance modelling problems.

2. Obtain an overview of the key features and functionalities included in the LRMoE software packages.

3. Know how to conduct simulation studies and how to analyze real insurance datasets with the LRMoE software packages.

Moderator:	Mary Jo Kannon
Speaker:	Ian Weng Chan, University of Toronto

Concurrent Sessions 5, Wednesday, March 15, 9:45 AM - 11:00 AM, Commodore CD

❑ ⚛ ⚛ M-5: Interpretability and Transparent Machine Learning

This session will discuss interpretation techniques for machine learning and AI. The session will focus on making machine learning models and their decisions interpretable. We will explore and compare different interpretation techniques (Feature Importance, Accumulated Local Effects, Partial Dependency Plots, Shapley Values, etc.). How do these techniques work? What are the advantages and disadvantages for each technique? How can their outputs be interpreted? Additionally, we will be discussing and comparing Shapley values between GBM vs Random Forest vs Layered GBM.

Learning Objectives:

1. Understand the concept of interpretability for Machine Learning.

2. Understand the different techniques related to interpretability.

3. Understand how to correctly apply interpretability techniques to Machine Learning models.

Moderator:	Don Hendriks
Speakers:	Liam McGrath, Data Scientist, Willis Towers Watson
	Rachael McNaughton, Radar Analytics Product Manager, WTW

Concurrent Sessions 4, Wednesday, March 15, 8:00 AM - 9:15 AM, Avalon

❑ ⚛ ⚛ M-6: Bonus-Malus Scales Models for Predictive Modeling

In recent papers, Bonus-Malus Scales (BMS) estimated using data have been considered as an alternative to longitudinal data and hierarchical data approaches to model the dependence between different contracts for the same insured. Those papers, however, did not discuss in detail how to construct and understand BMS models, and many of the BMS's basic properties were not discussed. The first objective of this session is to correct this situation by explaining the logic behind BMS models, and by describing those properties. More particularly, we will explain how BMS models are linked with simple GLM models that have covariates associated with the past claims experience. This could help actuaries to understand how and why they should use BMS models for experience rating. The second objective of the session is to create artificial past claims history for each insured. This is done by combining recent panel data theory with BMS models. We will show that this addition significantly improves the prediction capacity of the BMS, and provides a temporary solution for insurers who do not have enough historical data. We apply the BMS model to artificial data generated from a major Canadian insurance company. Results are analyzed deeply to identify specific aspects of the BMS model.

Learning Objectives:

1. Explain how Bonus-Malus Scales work.

2. Compare with Longitudinal Data Models for Predictive Rating.

3. Show how to create artificial historical data.

Moderator:	Brian Stoll
Speaker:	Jean-Philippe Boucher, Professor, University du Quebec a Montreal

Concurrent Sessions 6, Wednesday, March 15, 12:15 PM - 1:30 PM, Avalon

❑ ◉ ◉ M-7: Historical versus Model Data

In this session, we will provide an overview of the macro projections on climate change as delivered in the Sixth Assessment Report (AR6) from the Intergovernmental Panel on Climate Change (IPCC) and specifically connect them to the changes in weather patterns effecting severe convective storm. We will also demonstrate how modeling can take the randomness out of predicting expected weather-related losses. Finally, we will look at ways to combine modeling output with a company's historical loss data to ensure the actuary is using the best possible data to more accurately predict future weather-related losses.

Learning Objectives:

1. Discuss how climate change is impacting high frequency / low severity events such as severe convective storm.

2. Assess why historical losses could be missing a component of expected future losses.

3. Determine when and how to use models to supplement and/or replace historical data.

Moderator:	Steven Phillips
Speakers:	Daniel Ward
	Michael Tine

Concurrent Sessions 3, Tuesday, March 14, 3:30 PM - 4:45 PM, Cambria

❑ ◉ ◉ ◉ M-8: Inside the Black Box: Methods for ML Interpretation

Model transparency is essential to actuarial modeling, enabling the build of optimal models and the interpretation of model results for business use. The session will center around explanatory tools that communicate the predictive and interpretative power of analytic models. We will discuss common tools, such as SHAP and LIME, and how they are calculated and can be used to understand models that are typically "black box".

Learning Objectives:

1. Become familiar with the motivation for tools to interpret analytic models.

2. Define and calculate SHAP and LIME, both theoretically and programmatically.

3. Compare and contrast the uses, benefits, and limitations of common explanatory tools.

Moderator:	Gaetan Veilleux
Speakers:	Megan Camanocha, Consulting Actuary, Pinnacle Actuarial Resources, Inc.
	Erool Palipane, Data Scientist, Pinnacle Actuarial Resources, Inc.

Concurrent Sessions 2, Tuesday, March 14, 1:30 PM - 2:45 PM, Commodore CD

☐ ⦿ M-9: How to Find Data-driven Insights When You Have No Data (or Just Want More)

Are you looking to grow in new classes or geographies? Are you looking to start a new book of business? Or, do you simply want understand broad trends better? It's tough to build a pricing model when you lack data. This presentation will show you how you can use interesting external data sets reported by cities, from statutory returns and other sources to supplement your own data, with examples. Please come with the willingness to be creative, scrappy, and think outside-the-box.

Learning Objectives:

1. Become aware of the variety of alternative data sources that can provide insights to important questions we sometimes ignore.

2. Learn from examples on how to triangulate answers from alternative data sources.

3. Gain some insights on a variety of risks including inflation and fire frequency.

Moderator:	Rebecca Williams
Speakers:	Jessica Leong, Octagram
	Blake Berman, Managing Director, Strategic Advisory, Guy Carpenter & Co. LLC

Product/Innovation (PI)

Concurrent Sessions 5, Wednesday, March 15, 9:45 AM - 11:00 AM, Commodore E

☐ ⦿ PI-1: Improving Agency Analytics

While analytics are becoming common across insurers' various functions, simple heuristics like loss ratios are still common for agency and distribution channel analytics at many P&C companies. In this session we will discuss similarities and differences between modeling agencies vs. policy level pricing analytics, challenges to consider, potential terms to include in models, and considerations when discussing with business areas.

Learning Objectives:

1. Describe challenges with modeling agencies and distribution channels.

2. Explain why asking the right question with agency analytics can be more important than the model structure.

3. Evaluate ways to achieve business support for implementing advanced agency analytics.

Moderator:	Seth Goodchild
Speakers:	Justin Milam, Associate Director, WTW
	Tom Heise, AVP, Enterprise Analytics, Grange Mutual Casualty Group

Concurrent Sessions

Concurrent Sessions 2, Tuesday, March 14, 1:30 PM - 2:45 PM, Commodore E

❑ ✺ PI-2: Driving Change: Telematics and AI in Commercial Auto

Over the last decade, Commercial auto has struggled to be a profitable line of business for most insurers. This trend improved during the COVID pandemic with reduced driving, but there is skepticism in the market that this is a long term turn around.

Telematics provides new companies a way to disrupt long established business models and for established companies, innovations to improve their pricing and underwriting. The challenges for both types of companies has been an overall lack of commercial auto telematics data. Combining the right data with AI technology, telematics scoring looks to solve the woes of this long beleaguered market.

In this session, we will discuss how to leverage data and AI to more accurately price and underwrite commercial auto risk and how an innovative startup is leveraging this technology to break into the market.

Learning Objectives:

1. Discuss the development and implementation of telematics scoring in commercial auto.

2. Review methodologies and results of scoring in a case study for long haul trucking.

Moderator:	Kiki Wang
Speakers:	Lawrence Baeder, Data Scientist, Milliman
	Cletus Nunes
	Alex Carges, Nirvana Tech, Inc

Concurrent Sessions 3, Tuesday, March 14, 3:30 PM - 4:45 PM, Commodore E

❑ ✺ PI-3: Actuaries in Tech Panel Discussion

A live discussion among actuaries working in the technology space, by Actuaries at Tech companies, InsurTech companies, and innovation areas of traditional insurers.

Learning Objectives:

1. Explain compliance hurdles commonly encountered when starting an insurance carrier or MGA/MGU

2. Describe actuarial roles beyond traditional insurance carriers and insurance consulting

3. Apply new technology to traditional actuarial roles

Moderator:	Brian Fannin
Speakers:	Kathryn Koch, Consulting Actuary, Lewis & Ellis, Inc.
	Kevin McBeth, Coherent
	Thomas Holmes, Head of Actuarial Data Science US, Akur8
	Kathleen Ores Walsh, VP of Pricing and Product Analytics, USAA

Concurrent Sessions 4, Wednesday, March 15, 8:00 AM - 9:15 AM, Cambria

❑ ⊛ ⊛ **PI-4: Unlocking the True Value of ADAS**

Adaptive Driver Assistance Systems (ADAS) are being incorporated into more vehicles on the road today. While these systems are designed to reduce accidents and save lives, the impact on insurance costs is not as clear. One reason for this is that the presence of these systems was not easily determined, and some of the systems have been slow to appear in existing vehicles, which has delayed the emergence of experience. Pinnacle will present the results of research on the true impact of ADAS on the frequency of accidents, and the ultimate costs related to injuries and repairs.

Learning Objectives:

1. Describe the different ADAS options available and how prevalent these systems are in the vehicle population.

2. Describe the limitations of the historical territory definition process.

3. Provide the results of analysis of ADAS on frequency of accidents and ultimate cost of the accidents.

Moderator:	Roosevelt Mosley
Speakers:	Gaetan Veilleux, Senior Consulting Actuary, Pinnacle Actuarial Resources, Inc.
	Joey Sveda, Consulting Actuary, Pinnacle Actuarial Resources

Concurrent Sessions

Concurrent Sessions 1, Tuesday, March 14, 10:30 AM - 11:45 AM, Cambria

❑ ☀ **PI-6: Underwriting a Greener Future**

Corporations, governments, and non-governmental organizations are increasingly mandated by investors and regulators to disclose and manage the risks that their operations and value chains pose to various stakeholders. Risk transfer has emerged as a tool that plays a deliberate role in advancing (E)nvironmental, (S)ocial, and (G)overnance initiatives and investments by increasing economic and climate (R)esilience (which we collectively refer to as ESG+R). For example, institutions are executing risk transfer products to create value through expanding uptake of sustainable technologies; accessing more attractive financing for projects and investments; and protecting balance sheets and earnings; amongst other applications. This presents a growing opportunity for the re/insurance industry to extend existing underwriting frameworks and create novel risk transfer products that enable sustainable growth. In this session we will discuss ESG+R from the perspective of both MGAs and risk capacity providers. Themes covered through case studies and discussions with practitioners will include:

- Developing, promoting, and measuring the impact of innovative risk transfer products
- Increasing economic and climate resilience via risk transfer products
- Leveraging scalable technology to underwrite and reinsure climate risks typically retained by insurers

Learning Objectives:

1. Brainstorm risk transfer products that help attain sustainable development goals.
2. Learn underwriting techniques to evaluate new risks.
3. Feel energized about the many ways insurance can make a positive difference.

Moderator:	Steve Bennett
Speakers:	Matt Coleman, The Demex Group
	Jaesung Park, Nephila Capital
	Stephen Bennett
	Sherry Huang, New Energy Risk

Concurrent Sessions 6, Wednesday, March 15, 12:15 PM - 1:30 PM, Cambria

❑ ☀ **PI-7: Quantum Computing and Insurance**

Quantum Computing is out there, but when and how might it impact insurance operations and actuarial work? This session is a primer on Quantum Computing - what it is, the current status of development, and possible applications in the insurance space.

Learning Objectives:

1. Describe what Quantum Computing is and how it differs from standard computing
2. Recognize when Quantum Computing becomes commercially viable
3. Evaluate how Quantum Computing could be applicable to different insurance problems

Moderator:	Kim Ward
Speakers:	Christopher Cooksey, Senior Director of Advanced Analytics, Guidewire
	Jason Kichen

Concurrent Sessions 5, Wednesday, March 15, 9:45 AM - 11:00 AM, Avalon

❑ ⦾ PI-8: Cyber Product

Cyber insurance has benefitted from significant innovation in recent years. A rapidly evolving risk landscape has challenged actuaries to find novel sources of data with which to develop rating plans. New threat actors and tactics have also challenged product managers to address the evolving risk via terms and conditions – as well as by helping policyholders improve their risk profiles in a way that potentially flows back to rating. In this session we will review examples of how rating and product management are evolving and the discuss the interconnectedness between the two.

Learning Objectives:

1. Describe key aspects of typical cyber insurance products and related rating.

2. Utilize novel data sourcing to address issues of historical data thinness or obsolescence.

3. Develop insights to help policyholders improve their risk profiles.

Moderator:	Kiki Wang
Speakers:	Matthew Savolskis, Regional Actuary, Verisk Underwriting Solutions
	Dean Guo, Actuarial Analyst, Resilience Insurance

Concurrent Sessions 1, Tuesday, March 14, 10:30 AM - 11:45 AM, Britannia

❑ ⦾ PI-9: GPT-3 and the Actuarial Landscape: An Overview of Large Language Models and Applications

Inspired by the recent popularization of GPT-3, the model that powers OpenAI's ChatGPT, this presentation will provide an overview of large language models and explore their potential applications in the insurance industry. GPT models have achieved groundbreaking results in a variety of natural language processing tasks. We will examine the potential impacts of GPT-3 and similar models on the insurance industry and actuarial work. We will also explain how these models work to enable a deeper understanding. Lastly, we will discuss a new software paradigm enabled by such AI advancements, "Software 2.0", and how actuaries can modernize their skillset.

Learning Objectives:

1. Understand the details and capabilities of GPT-3 and similar language models.

2. Explore the applications and impacts of these models in the insurance industry.

3. Learn about how actuaries can modernize their skillset to adapt to a new software paradigm.

Moderator:	Kim Ward
Speakers:	Olivier Brown, Principal, Oliver Wyman Actuarial Consulting
	Hugo Latendresse, Oliver Wyman Actuarial Consulting
	Sabrina Tan, Oliver Wyman Actuarial Consulting

Professionalism and Regulation (PR)

Concurrent Sessions 4, Wednesday, March 15, 8:00 AM - 9:15 AM, Commodore B

❑ ☀ **PR-1: Florida Homeowners: Double Trouble**

The Florida homeowners market is in a state of crisis after several years of worsening results. 2021 and 2022 saw multiple insolvencies, tightening underwriting standards, withdrawals of several carriers from the market, skyrocketing rate levels, a tight reinsurance market, extraordinary growth in Citizens Property Insurance Corporation (the insurer of last report) and Hurricane Ian. This session will discuss the history of this complex and dynamic market, including reasons for the unique nature of insurers servicing the market, and trends & events that have shaped the market such as: • Steady population and exposure growth • Litigation trends • Assignment of Benefits (AOB) which has impacted Florida much more than other states • The Florida Hurricane Catastrophe Fund • Growth of Citizens Property Insurance Corporation • Legislative reforms. This session will also discuss the solutions being proposed to address the current issues and how a pricing actuary might react to the situation.

Learning Objectives:

1. Acquire knowledge of the Florida homeowners insurance market.

2. Learn how the Florida homeowners market is impacted by litigation trends and the legislative environment.

3. Obtain insights on how to consider the dynamics of the Florida homeowners insurance market in pricing work.

Moderator/Speaker: Klayton Southwood, Senior Director, WTW

Speaker: Trevar Withers, Director, WTW

Concurrent Sessions 3, Tuesday, March 14, 3:30 PM - 4:45 PM, Commodore B

❑ ☀ ☀ **PR-2: Back by Popular Demand: Revision of ASOP 12 Risk Classification – and Other Related Activities**

The Actuarial Standards Board is proposing changes to ASOP 12 on Risk Classification.

Insurance rates in many states shall not be "excessive, inadequate, or unfairly discriminatory." The actuarial profession has long considered that rates meet those rating laws if the rates are actuarially sound. But understanding the precise meanings of "actuarially sound" and "unfairly discriminatory" requires a more nuance understanding. Today's changing views which reflect the nature of social structures and advances in predictive analytics has caused reconsideration of whether existing notions of unfair discrimination and actuarial soundness might perpetuate socially undesirable inequities in insurance products, services, prices (rates), and availability. Presentation materials will be revised to include current updates on ASB activities.

Learning Objectives:

1. Explain the process of revising ASOP 12 and the current status of that work. Describe what guidance an ASOP could address for actuaries who develop, review or use risk classifications.

2. Recognize how risk classification might result in unfair discrimination and recognize how unintended bias in outcomes may arise when using a risk classification system.

3. Describe the work of the cross-practice actuarial committee focused on issues relevant to risk classification and related actuarial work.

Moderator: Mary Jo Kannon

Speakers: Robert Miccolis, Miccolis Consulting LLC

                              Shawna Ackerman, California Earthquake Authority

Concurrent Sessions

Concurrent Sessions 2, Tuesday, March 14, 1:30 PM - 2:45 PM, Britannia

❑ ☸ ☸ PR-3: Perspectives on Current Events in California's Insurance Market

California is the nation's largest insurance marketplace, and also known to be forward-thinking in the face of climate change and economic challenges. Hear a panel of experts discuss recent developments in personal auto and homeowners insurance. Likely topics of discussion include: (1) new wildfire mitigation regulations and how California FAIR Plan is responding to the new regulations by using its vast amount of wildfire exposure and loss data to calculate and introduce new mitigation discounts in a way that insurance companies can use; (2) rate approvals in the post-COVID era and how you can improve the quality of California rate and class plan, form and rule filings; (3) implementation of SB 1107 which will require new financial responsibility minimums for auto liability; and (4) public policies that both regulators and the industry must consider to support a healthy and stable insurance marketplace.

Learning Objectives:

1. Understand how to implement new California wildfire mitigation regulations.
2. Improve the quality of California P&C filing components.
3. Communicate and work effectively with regulators.

Moderator:	Joyce Hwu
Speakers:	Spencer Kook, Hinshaw & Culbertson LLP
	Sheri Scott, Principal & Consulting Actuary, Milliman
	Kenneth Allen, California Department of Insurance

Concurrent Sessions 6, Wednesday, March 15, 12:15 PM - 1:30 PM, Commodore B

❑ ☸ ☸ PR-4: Professionalism Scavenger Hunt

Using US Qualification Standards, Code of Professional Conduct, and Actuarial Standards of Practice - we'll be on a Scavenger Hunt to find specific provisions and guidance! Join us to talk about Professionalism in a new way.

Attendees are encouraged but not required to have access to a laptop computer during the session to help them with the scavenger hunt

Learning Objectives:

1. Interact with the Actuarial Standards of Practice.
2. Earn Professionalism Education credits.
3. Get a head start on 2023 Continuing Education.

Moderator/Speaker:	Ken Williams, Staff Actuary, Casualty Actuarial Society
Speakers:	John Gleba, Vice President & Secretary, Madison Consulting Group
	Josh Taub, Instructor, The Infinite Actuary

Concurrent Sessions 1, Tuesday, March 14, 10:30 AM - 11:45 AM, Aurora

❑ ⚙ PR-5: Partner with Compliance for Product Development

Learn how policy wording affects your actuarial work and better understand how to work with state regulators. This session will be based around an interactive game based on an insurance policy wording case study. We will focus on homeowners and commercial auto examples.

Learning Objectives:

1. Describe how compliance and product professionals respond to regulatory concerns.

2. Recognize problematic policy wording.

3. Develop better relationships with compliance and product development professionals to create efficient workflows.

Moderator/Speaker:	Reese Mularz, Actuary, Milliman
Speakers:	Courtney Burke
	Christine Perkovich O'Brien

Ratemaking (R)

Concurrent Sessions 5, Wednesday, March 15, 9:45 AM - 11:00 AM, Commodore B

❑ ⚙ R-1: Bias Discussion 2.0: Fairness in Insurance Modeling

There has been a significant amount of discussion, debate, and research around the examination of rates and actuarial models for potential bias against protected classes. This has led to several potential approaches to measuring and mitigating potential bias. As with any emerging area, moving from a theoretical construct to practical implementation can be a challenge, and often results in unexpected implications. This session will cover the practical considerations around the implementation of several methods for measuring and mitigating potential bias. Examples of these practical considerations will be provided.

Several ideas and approaches exist for quantifying 'fairness' in predictive model results. This session uses concrete examples to show the pros and cons. Is using a predictor that is correlated with a restricted attribute always bad? What do the fairness metrics of Independence, Separate and Sufficiency mean?

Learning Objectives:

1. Review of potential approaches for measuring and mitigating potential bias in rates.

2. Describe key practical challenges in implementing these approaches.

3. Identify several points of evaluation in the model building process and articulate the pros and cons of fairness evaluations conducted prior to a model's creation.

Moderator:	Joey Sveda
Speakers:	Christopher Cooksey, Senior Director of Advanced Analytics, Guidewire
	Gary Wang, Senior Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Concurrent Sessions 4, Wednesday, March 15, 8:00 AM - 9:15 AM, Britannia

❑ ☀ R-2: Back Through the Looking Glass(es): An Actuarial and Economic Look at the Workers Compensation System

This session will discuss how the dynamics of the current environment have impacted the workers compensation system – including financial results, frequency and severity trends, the changing labor force, and inflation, from both actuarial and economic perspectives. It will include a high-level recap of where the line has been and where it may be headed.

Learning Objectives:

1. Discuss a variety of workers compensation topics.

2. Provide an overview of financial results and recent trends.

3. Discuss results from both actuarial and economic perspectives.

Moderator:	Carolyn Wise, Associate Actuary, NCCI Holdings, Inc
Speaker:	Patrick Coate, NCCI Holdings, Inc

Concurrent Sessions 6, Wednesday, March 15, 12:15 PM - 1:30 PM, Commodore E

❑ ☀ ☀ R-3: Ratemaking for InsurTechs

The session will provide two case studies of innovative ratemaking techniques for insurtech products. These ratemaking techniques can be applied to more traditional insurance products to innovate The first case study will focus on an insurtech homeowners carrier. Insurtechs looking to enter more traditional lines of insurance are faced with the challenge of how to differentiate their product in a heavily saturated and competitive marketplace. This case study will focus on how innovative ratemaking techniques can be applied to allow for new product features that better match rates to risk and allow for product differentiation in the marketplace. This will include a demonstration of innovative features recently incorporated into an insurtech homeowners program. The second case study will focus on insurance for cryptocurrency mining operations. Insurtechs in new emerging markets face the challenge of developing products for potentially complex risks with limited data. This case study will provide a high level overview of how insurtechs apply traditional ratemaking techniques to new and emerging risks. This will include a demonstration of how the rates for a new cryptocurrency mining operations insurance product were developed.

Learning Objectives:

1. Learn to design new and innovative product features.

2. Develop approaches to apply traditional ratemaking techniques to new and emerging risks.

3. Learn about recent innovative product features for homeowners, cryptocurrency mining, and motorcycle.

Moderator:	Sheri Scott
Speakers:	Nickolas Alvarado, Milliman
	Christine Perkovich O'Brien
	Blair Baldwin

Concurrent Sessions

Concurrent Sessions 5, Wednesday, March 15, 9:45 AM - 11:00 AM, Britannia

❑ ☀ **R-4: Location, Location, Location: Importance of Geocoding Accuracy in Pricing Natural Catastrophes and Concentration Risk**

We will demonstrate the importance of accurate geocoding in classifying catastrophic risk, including the particularly sensitive perils of wildfire and flood. This will include exploring how geocoding works, why not all geocoding results are "created equal," and how to address limitations with geocoding. We will also discuss why wildfire and flood are such localized perils, with risk varying greatly between relatively close locations. Finally, we will consider other implications of understanding an exposure's accurate location, such as underwriting and managing concentration.

Learning Objectives:

1. Understand the geocoding process, how to interpret the results, and important limitations.
2. Understand drivers of flood and wildfire risk, particularly small-scale, local factors.
3. Understand the importance to property insurers of knowing accurate location information for their insured risks.

Moderator:	Howard Kunst
Speakers:	Garrett Bradford, Cartographer, Milliman, Inc.
	Greg Dietzen, Actuary, Milliman

Concurrent Sessions 3, Tuesday, March 14, 3:30 PM - 4:45 PM, Aurora

❑ ☀ **R-5: Agricultural, Farm & Ranch Insurance: Practicing in the Actuarial Back Forty**

Farmowners insurance is a $5b segment, placing it ahead of business lines like product liability, flood, and earthquake. Yet, you've probably never heard a presentation on it. Hear from some actuaries at companies where agricultural products are the main focus, and learn how their experience differs from working on the larger product lines.

Learning Objectives:

1. Recognize major drivers of farm premium/loss.
2. Name several nuances in pricing farm business.
3. Contrast cat perils to which farms are exposed.

Moderator:	Steven Phillips
Speakers:	Brant Wipperman, The Mutual Fire Insurance Company of British Columbia
	James Heidt, AVP Agribusiness Pricing, Nationwide Insurance

Concurrent Sessions 2, Tuesday, March 14, 1:30 PM - 2:45 PM, Aurora

❑ ❀ ❀ R-7: Information and Incentives in Reinsurance Contracts

First, in a stylized model of aggregate excess of loss reinsurance, it is shown how the reinsurer can insulate itself from adverse selection by offering a menu of contracts. There are two types of (potential) cedents, one type having a loss distribution with a low mean, and the other type having a loss distribution with a high mean The reinsurer is unable to distinguish the type, but knows the two means and the (weighted) average mean (Akerlof, 1970). In a signaling game, both types of cedents send out a "low mean" signal, which generates a pooling equilibrium (Spence, 1973). The reinsurer offers the cedents a menu of contracts, which generates a screen that provides the cedents an incentive to self-select based on the type (Rothschild and Stiglitz, 1976). Both types of cedents transact, and the reinsurer breaks even with both types of cedents. The model covers the cases of proportional reinsurance and retroactive reinsurance.

Second, it is argued that an insurer can use retroactive reinsurance to generate credible information about its back book. Uncertainty about the adequacy of reserves in the eyes of the marginal investor can generate an intangible liability on the insurer's economic balance sheet, depressing the insurer's market-to-book ratio. An adverse development cover (ADC) then serves as a means of overcoming asymmetric information between the insurer and the (marginal) investor. Further, by reducing reserve risk, the insurer increases the sensitivity of the firm to underwriting risk. This way an ADC serves as a commitment to future underwriting performance. ADC structures vary by the information content they generate and the incentive structures they establish. Important structural components are in-the-money, at-the-money, and out-of-the money attachment points, funds withheld vs funds-transferred arrangements, and claims control. It is discussed how structuring, including the providing of a menu of contracts, is critical to overcoming asymmetric information and generating incentive compatibility.

Learning Objectives:

1. Explain standard reinsurance structures.

2. Design reinsurance to suite specific business needs and mitigate adverse contract selection.

Moderator:	Katie Pipkorn
Speakers:	Nathan Lord, Co-Founder, Jaffa
	Frank Schmid, General Reinsurance Corporation

Concurrent Sessions 6, Wednesday, March 15, 12:15 PM - 1:30 PM, Britannia

❑ ◉ ◉ R-8: Call Paper Program: Nonlife Insurance Risk Classification Using Categorical Embedding

We are excited to have Dr. Peng Shi and co-author share about their award-winning paper on Nonlife Insurance Risk Classification Using Categorical Embedding.

This talk presents several actuarial applications of categorical embedding in the context of nonlife insurance risk classification. In nonlife insurance, many rating factors are naturally categorical and often the categorical variables have a large number of levels. The high cardinality of categorical rating variables presents challenges in the implementation of traditional actuarial methods. Categorical embedding that is proposed in the machine learning literature for handling categorical variables has recently received attention in actuarial studies. The method is inspired by the neural network language models for learning text data and maps a categorical variable into a real-valued representation in the Euclidean space. Using a property insurance claims data set, we demonstrate the use of categorical embedding in three applications. The first shows how embeddings are used to construct rating classes and calculate rating relativities for a single insurance risk. The second concerns predictive modeling for multivariate insurance risks and emphasizes the effects of dependence on tail risks. The third focuses on pricing new products where transfer learning is used to gather knowledge from existing products.

Learning Objectives:

1. Articulate the issues with using categorical rating variables of high cardinality.
2. Implement categorical embedding in the context of GLMs.
3. Identify actuarial applications of categorical embedding.

Moderator:	Jamie Mills
Speaker:	Peng Shi, Associate Professor, University of Wisconsin-Madison

Concurrent Sessions 2, Tuesday, March 14, 1:30 PM - 2:45 PM, Cambria

❑ ◉ ◉ R-9: Special Considerations and Innovation in Loss Ratio Estimation

This session will (1) explore special considerations in portfolio loss ratio estimation; (2) explore potential model-informed enhancements to traditional actuarial methods; and (3) argue that traditional methods have had remarkable staying power due to insulation from market forces, but that insulation is coming to an end.

Learning Objectives:

1. Evaluate the effectiveness of rate level methods.
2. Critique traditional actuarial rate level approaches.
3. Predict loss ratios in light of special considerations.

Moderator:	Don Hendriks
Speakers:	Anand Khare, Chief Actuary, Ledger Investing
	Mark Shoun, Chief Data Scientist, Ledger Investing

Concurrent Sessions

Wildfire (WF)

Concurrent Sessions 1, Tuesday, March 14, 10:30 AM - 11:45 AM, Commodore CDE

❑ ☀ WF-1: Mitigation that Matters: Wildfire Case Study

In recent years, insurers have been increasing rates, non-renewing risks, and refining their rating plans to account for wildfire risk. While these actions may address insurer profitability, they do little for the homes in high-risk areas who see premium increases, policy non-renewals, and commonly are denied new policies by insurance companies even if mitigation efforts have been put in place.Hurricane mitigation credits have long existed in insurance rating plans in exposed states, but wildfires have only recently become financially significant enough to necessitate similar pricing actions from the insurance industry. To date, few companies offer discounts for property-specific home hardening or community mitigation efforts. For the companies who have filed such discounts, they are often modest and judgmentally quantified. Appropriate quantification of the impacts of various mitigation efforts can benefit both insurers and consumers, as well as inform public policy and public safety decisions. In this session we will discuss actuarial considerations and approaches for developing wildfire mitigation credits and the results of the wildfire mitigation case studies presented in the paper "Catastrophe Models for Wildfire Mitigation: Quantifying Credits and Benefits to Homeowners and Communities".

Learning Objectives:

1. Discuss actuarial and practical considerations applicable to the development of wildfire mitigation credits.
2. Review results individual property mitigation and community-level mitigation analyses.
3. Design a mitigation study analysis.

Moderator:	Katie Pipkorn
Speakers:	Margaret Brinkmann, Actuary, Milliman
	Tom Larsen, Senior Director, Insurance Solutions, CoreLogic

Concurrent Sessions 3, Tuesday, March 14, 3:30 PM - 4:45 PM, Britannia

❑ ☀ WF-3: Wildfire: Still a Hot Topic in the Wild West

In recent years, flames have blazed across California like never before. While wildland-urban interface zones have burned, the heat is also being felt in insurance regulation, creating a need for innovative solutions. The devastating aftermath of the California wildfires has ignited the minds of insurance entities, scientists, and property owners to begin rewriting the rulebook for wildfire coverage in the insurance industry. California is rebuilding not only its communities but the way it approaches wildfire. Explore how it all began, the newest developments, and our glimpse into California's future pertaining to wildfire.

Learning Objectives:

1. Identify trends in wildfire activity and how this risk has been evolving over recent years.
2. Develop an understanding of recent legislation in California and its potential impacts.
3. Understand how different parties are responding to wildfire risk.

Moderator:	Kathy Knudson
Speakers:	Yinpok (Robert) Lee, Milliman
	Taylor Deacon, Milliman

Movie Screening, Tuesday, March 14, 6:30 PM - 8:30 PM, Commodore E

❑ ☀ **WF-2: "Elemental" Movie (Special Screening) & Discussion**

SPECIAL IN-PERSON ONLY SCREENING of the new documentary, "Elemental" about wildfire in the American West.

Since 2017, wildfires have impacted the insurance industry like never before. As industry professionals, you likely have experience in modeling or pricing wildfire related risks, or you may have witnessed the devastation wildfires can bring to communities. We think it is important to have opportunities for our industry to continue to learn and converse about wildfire – to share ideas, voice concerns, and work together to solve some of the challenges brought by this peril.

While Elemental has been shown at film festivals across the country this year, we wanted to give you a convenient opportunity to experience the movie and participate in a discussion with the goal of sparking conversation about the topics raised by the short film.

NOTE: Join filmmaker Ralph Bloemers and actor/research contributor, Dr. Alexanda Syphard for discussion immediately following the movie's end credits on Tuesday, March 14. Our sponsor, Milliman, will provide treats for this Watch Party and deep dive into the topic of wildfire. RSVP by 5:00 pm, PT on Mar 14 to give us a headcount for planning purposes:www.surveymonkey.com/r/ElementalMovie23RPM

Also, a roundtable discussion will take place the next day at 7:00 am, PT on Wednesday, Mar 15.

Moderator:	Jamie Mills
Speakers:	Alexandra Syphard
	Ralph Bloemers

Personal Attendance Record

Full-Day Workshops
Monday, March 13, 8:00 AM – 5:00 PM (8.4 CE)

☐	WS-1	🎤◎◎	Building GLM/GBM Using R	Aurora

Half-Day Morning Workshops
Monday, March 13, 8:00 AM – 12:00 PM (4.2 CE)

☐	WS-2	🎤◎	Basic Ratemaking	Britannia
☐	WS-3	🎤◎◎	CAT Modeling and Pricing	Cambria
☐	WS-4	🎤◎◎	Dynamic Personal Auto Simulation	Sovereign

Half-Day Afternoon Workshops
Monday, March 13, 12:00 PM – 5:00 PM (4.2 CE)

☐	WS-5	🎤◎◎	Advanced Ratemaking	Britannia
☐	WS-6	🎤◎	Product Management/Development	Cambria
☐	WS-7	🎤◎◎	Text Analysis Using R/Python	Sovereign

Morning Roundtables
Tuesday, March 14, 7:00 AM – 7:50 AM (1 CE)

☐	RT-1	🎤◎	Challenges in Florida	Britannia
☐	RT-2	🎤◎	Nifty R Scripts	Cambria
☐	RT-3	🎤◎	Leading Small Actuarial Departments	Aurora
☐	RT-4	🎤◎	Inflation and Covid- Complications for Pricing Analysis	Sovereign

Featured Speaker
Tuesday, March 14, 8:00 AM – 10:00 AM (1.8 CE)

☐	GS-1	▶◎	All Hands on Deck: Risk Management and the US Navy	Commodore CDE

Concurrent Sessions 1
Tuesday, March 14, 10:30 AM – 11:45 AM (1.5 CE)

☐	M-1	▶◎◎	The Practical Impact of Credibility Models	Commodore B
☐	PI-6	◎	Underwriting a Greener Future	Cambria
☐	PI-9	◎	GPT-3 and the Actuarial Landscape: An Overview of Large Language Models and Applications	Britannia
☐	PR-5	◎	Partner with Compliance for Product Development	Aurora
☐	WF-1	▶◎	Mitigation that Matters: Wildfire Case Study	Commodore CDE

Personal Attendance Record

Concurrent Sessions 2
Tuesday, March 14, 1:30 PM – 2:45 PM (1.5 CE)

☐	M-2		Penalized Regression Between Credibility and GBMs	Commodore B
☐	M-9		How to Find Data-driven Insights When You Have No Data (or Just Want More)	Commodore CD
☐	PI-2		Driving Change: Telematics and AI in Commercial Auto	Commodore E
☐	PR-3		Perspectives on Current Events in California's Insurance Market	Britannia
☐	R-7		Information and Incentives in Reinsurance Contracts	Aurora
☐	R-9		Special Considerations and Innovation in Loss Ratio Estimation	Cambria

Concurrent Sessions 3
Tuesday, March 14, 3:30 PM – 4:45 PM (1.5 CE)

☐	M-8		Inside the Black Box: Methods for ML Interpretation	Cambria
☐	PI-3		Actuaries in Tech Panel Discussion	Commodore E
☐	PR-2		Back by Popular Demand: Revision of ASOP 12 Risk Classification – and Other Related Activities	Commodore B
☐	R-5		Agricultural, Farm & Ranch Insurance: Practicing in the Actuarial Back Forty	Aurora
☐	WF-3		Wildfire: Still a Hot Topic in the Wild West	Britannia

Movie Screening & Discussion
Tuesday, March 14, 6:30 PM – 8:30 PM (0.6 CE)

☐	WF-2		"Elemental" Movie Screening and Discussion with Special Guests	Commodore E

Breakfast Roundtables
Wednesday, March 15, 7:00 AM – 7:50 AM (1 CE)

☐	RT-5		Data for Wildfires	Britannia
☐	RT-6		Professionalism Code of Conduct Case Studies	Cambria
☐	RT-7		Actuaries in Tech Round Table	Avalon
☐	RT-8		Flood	Commodore CD

Concurrent Sessions 4
Wednesday, March 15, 8:00 AM - 9:15 AM (1.5 CE)

☐	M-3	▶🌀	Advanced Machine Learning in Real Life	Commodore E
☐	M-6	🌀🌀	Bonus-Malus Scales Models for Predictive Modeling	Avalon
☐	PI-4	🌀🌀	Unlocking the True Value of ADAS	Cambria
☐	PR-1	▶🌀	Florida Homeowners: Double Trouble	Commodore B
☐	R-2	🎤🌀	Back Through the Looking Glass(es): An Actuarial and Economic Look at the Workers Compensation System	Britannia

Concurrent Sessions 5
Wednesday, March 15, 9:45 AM – 11:00 AM (1.5 CE)

☐	M-4	🌀🌀	Mixture-of-Experts Models for Claim Frequency and Severity	Cambria
☐	M-5	🌀🌀	Interpretability and Transparent Machine Learning	Commodore CD
☐	PI-1	▶🌀	Improving Agency Analytics	Commodore E
☐	PI-8	🌀	Cyber Product	Avalon
☐	R-1	▶🌀	Bias Discussion 2.0: Fairness in Insurance Modeling	Commodore B
☐	R-4	🌀	Location, Location, Location: Importance of Geocoding Accuracy in Pricing Natural Catastrophes and Concentration Risk	Britannia

Concurrent Sessions 6
Wednesday, March 15, 12:15 PM – 1:30 PM (1.5 CE)

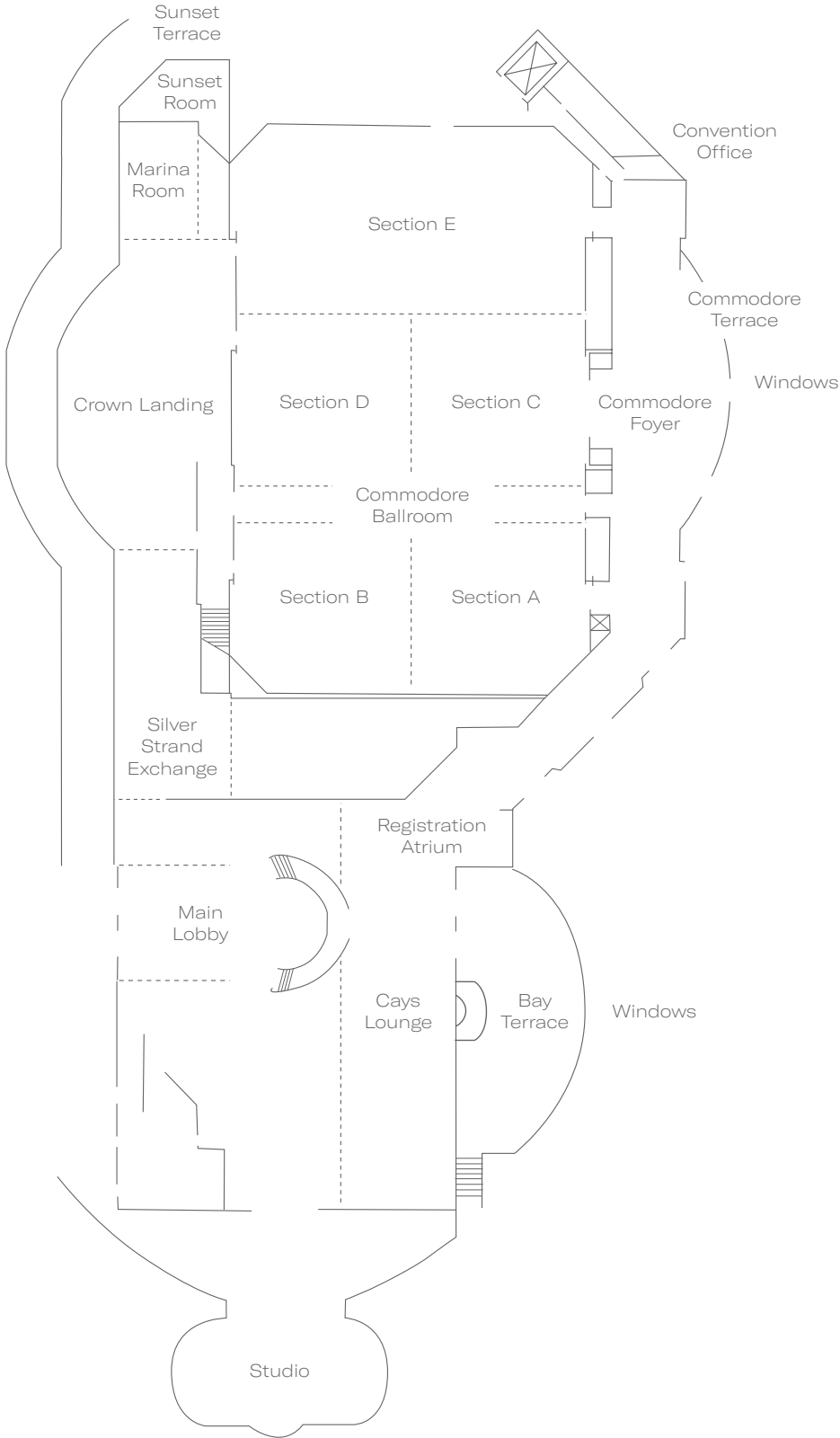| ☐	M-7	🌀🌀	Historical versus Model Data	Avalon
☐	PI-7	🌀	Quantum Computing and Insurance	Cambria
☐	PR-4	🎤▶🌀🌀	Professionalism Scavenger Hunt	Commodore B
☐	R-3	▶🌀🌀	Ratemaking for InsurTechs	Commodore E
☐	R-8	🌀🌀	Call Paper Program: Nonlife Insurance Risk Classification Using Categorical Embedding	Britannia

Closing General Session
Wednesday, March 15, 1:45 PM – 3:15 PM (1.8 CE)

☐	GS-2	▶🌀	IP (Inflationary Pressure)! IP (Industry Panel)! Hooray?	Commodore E

Hotel Map

First Floor

Sunset Terrace

Sunset Room

Marina Room

Convention Office

Section E

Commodore Terrace

Windows

Crown Landing

Section D

Section C

Commodore Foyer

Commodore Ballroom

Section B

Section A

Silver Strand Exchange

Registration Atrium

Main Lobby

Cays Lounge

Bay Terrace

Windows

Studio

Hotel Map

Second Floor

Windows

Aurora

Britannia

Cambria

Lenore

Avalon

Windows

Reliance

Board Room

Windows

Sovereign

Lobby Below

Constellation Foyer

Bayviews

Constellation

Section B

Section A

Constellation Terrace