2019 ACTUARIAL RESEARCH CONFERENCE

AUGUST 14 – 17, 2019

Planning Committee
Jeff Beckley – Purdue University – Chair
Carl Cowen – IUPUI
Gary Dean – Ball State University
Anna Hook – Purdue University
Cindy Ritchie – IUPUI
Jianxi Su – Purdue University
Tom Totten – University of Notre Dame
Chris Wilson – Butler University
Zhixin Wu – DePauw University

Scientific Committee
William Cross – IUPUI - Chair
Vytaras Brazauskas – UW, Milwaukee
Ian Duncan – UC-Santa Barbara
Runhuan Feng – University of Illinois
Bart Frye – Ball State University
Rasitha Jayasekare – Butler University
Jianxi Su – Purdue University
Zhixin Yang – Ball State University
Zhongyi Yuan – Penn State University
Wednesday, August 14

6:00 – 8:00  Welcome Reception    Skyline Club
             OneAmerica Square – 36th Floor
             Sponsored by Milliman

Thursday, August 15 – Conference Day 1

The venue for the Conference is the Informatics and Communications Technology Complex on the IUPUI Campus.
The address of the venue is 535 W. Michigan St, Indianapolis.

8:00 – 8:45  Continental Breakfast and Registration    Faculty Lounge
             Sponsored by the Casualty Actuarial Society

1A Plenary Session 1, Chair: Jeff Beckley    Auditorium – Room 152

8:45 – 8:50  Announcements and Introduction of the Dean of Science
             Jeff Beckley, Planning Committee

8:50 – 9:00  Welcome to Indianapolis and IUPUI Campus
             Shiaofen Fang, Interim Dean of Science

9:00 – 10:00 Keynote Presentation: US Mortality: Underlying Trends By Socioeconomic Group and Cause of Death
             Andrew Cairns
             Professor of Financial Mathematics at Heriot-Watt University, Edinburgh, and Director of the Actuarial
             Research Centre of the Institute and Faculty of Actuaries

10:00 – 10:30 Coffee Break    Faculty Lounge
             Sponsored by the SOA Education and Research Section

PARALLEL SESSIONS 2A – 2E

10:30 – 12:00 2A: Invited Session 1: Education Updates from CAS, CIA, and SOA    Auditorium – Room 152

Casualty Actuarial Society Update by Ken Williams, CAS Staff Actuary
Canadian Institute of Actuaries Update by Bruce Jones, University of Western Ontario
Society of Actuaries Update by Stuart Klugman, SOA Staff Actuary

2B: Chair: Jianxi Su    Room 157
Variable selection on telematic data using SHAP and gradient boosting machine algorithm, by
Noureddine Meraïhi, Université du Québec à Montréal

Model error in the current CMS evaluation method, by Elise Bonfiglio, University of California, Santa
Barbara

Non-homogeneous loss models applied to unearned premium risk, by Sébastien Jessup, Université du
Québec à Montréal

2C Chair: Jim Trimble    Room 159
Comparing the Riskiness of Dependent Portfolios via Nested L-Statistics, by Vytaras Brazauskas,
University of Wisconsin-Milwaukee

Assessing the Performance of Confidence Intervals for High Quantiles of Burr XII and Inverse Burr
Mixtures, by Tatjana Miljkovic, Miami University

Small-Sample Performance of the MTM and MWM Estimators for the Parameters of Log-Location-
Scale Families, by Qian Zhao, Robert Morris University
2D Chair: Brian Hartman Room 160
An application of survival models to estimate the expected future lifetime of hospice patients, by Ian Duncan, University of California Santa Barbara

Profiles of US Adults Based on Social Determinants and their Impact on Oral Health Outcomes and Health Expenditures, by Margie Rosenberg, University of Wisconsin- Madison

Diagnostics for Regression Models with Mixed Insurance Claim Data, by Lu Yang, University of Amsterdam

2E Chair: Bruce Jones Room 162
Importance-Allocated Nested Simulation (IANS) for tail risk estimation, by Jessica Dang, University of Waterloo

Valuations of Guaranteed Lifetime Withdrawal Benefit with New Performance Fee Structure, by Chongda Liu, University of Illinois at Urbana-Champaign

Outcome analysis of Indexed Universal Life Insurance based on Monte Carlo Simulation, by Songyu Yan, University of Minnesota--Twin City

12:00 – 1:00 Lunch Eiteljorg Museum
Sponsored by Anthem Blue Cross

1:10 – 1:25 Presentation by SOA Board Member for Research Sara Teppema, President, Alta Advisors
Introduction by Tom Totten, Planning Committee

PARALLEL SESSIONS 3A – 3E

1:30 – 3:00 3A: Invited Session 2: Actuarial Professionalism Auditorium – Room 152
James Miles – Consulting Actuary for the SOA
David Brentlinger – Sr VP, Chief Actuary and Chief Risk Officer at OneAmerica
Donna Megregian – Vice President and Actuary at RGA

3B: Chair: Sue Vagts Room 157
Actuarial education: critical thinking and history of science, by Christian Walter, Fondation Maison des sciences de l'homme

Open Actuarial Textbooks, by Jed Frees, University of Wisconsin-Madison

Pedagogic excellence in terms of executive function and goal-setting, by Russell Hendel, Towson University

3C Chair: Kristen Moore Room 159
On the dual Lévy risk model with a dividend threshold under Parisian ruin, By Zhong Li, University of International Business & Economics


A Note On Stochastic Dominance And Bounds On Probability Of Ruin By Mostafa Mashayekhi, University of Nebraska - Lincoln
3D  Chair: Ian Duncan  Room 160
The impact of unmet oral health needs on hospital emergency department utilization, by Lisa Gao, University of Wisconsin-Madison

Using Asymmetric Cost Matrices to Optimize Wellness Intervention, by Zoe Gibbs, Brigham Young University

Alternative Predictive Modeling for Medicare Patient Costs, by Samuel O'Neil, University of California, Santa Barbara

3E  Chair: Peter Douglas  Room 162
Using auto insurance claim adjuster notes to improve the structured model to predict the severity of bodily injury claims, by Isaac Golberg, University of California, Santa Barbara

I Know How You Drive! - Profiling via phone telematics, by Sak Lee, University of Iowa

Professionalism in Actuarial Science: Teaching Our Students to Be Actuaries, Not Just Test Takers – Part II, by Alisa Walch, University of Texas – Austin

3:00 – 3:30  Coffee Break  Student and Faculty Lounge
Sponsored by the Nyhart

PARALLEL SESSIONS 4A – 4E

3:30 – 5:00  Invited Session 3: Actuarial Society Sponsored Research  Auditorium – Room 152
Dale Hall, FSA, MAAA – Managing Director of Research at Society of Actuaries
Brian Fannin, ACAS, CSPA – Research Actuary at Casualty Actuarial Society
Shlomit Jacobson, PhD, MBA – Manager, Research at Canadian Institute of Actuaries
Steve Jackson, PhD – Assistant Director for Research at American Academy of Actuaries
Sarah Mathieson – Head of Research and Knowledge at Institute and Faculty of Actuaries

4B  Chair: Zhixin Wu  Room 157
What I Learned about Pedagogy from Magic School, by Diana Skrzydlo, University of Waterloo

Case Studies and Case Competitions: Tools to Provide Real World Property/Casualty Examples In Your Classes, by Ken Williams, Casualty Actuarial Society and Alisa Walch, University of Texas Austin

What I Tried That Was New, by Mark Maxwell, University of Texas - Austin

4C  Chair: Tatjana Miljkovic  Room 159
Regression Model for Data Breach Counts, Yangho Choi, Hanyang University

A Convex Method for Minimizing Ruin Probability, by Huan Zhang, University of St. Thomas

T- and W- Estimation for Insurance Loss Severity Models, by Chudamani Poudyal, Tennessee Technological University

4D  Chair: Rasitha Jayasekare  Room 160
Asymptotic Approximation of Aggregate Health Claims for a Large Population, by Xuemiao Hao, University of Manitoba

Treatment Level and Store Level Analyses of Healthcare Data, by Gee Y. Lee, Michigan State University

Bayesian Nonparametric Regression, by Robert Richardson, Brigham Young University
Friday, August 16 – Conference Date 2

8:00 – 8:45    Continental Breakfast    Student and Faculty Lounge
Sponsored by the American Academy of Actuaries

5A Plenary Session 2    Chair: Carl Cowen    Auditorium – Room 152
8:45 – 8:50    Announcements
Carl Cowen, Planning Committee
8:50 – 9:00    Invitation to 55th ARC at University of Nebraska, Sue Vagts
9:00 – 9:05    Simon Conference for Young Researchers in Risk Management and Insurance
Thorsten Moenig
9:05 – 10:05   Keynote Presentation: Long Term Portfolio Protection
Jan Vecer
Professor, Charles University
10:05 – 10:30  Coffee Break    Student and Faculty Lounge
Sponsored by the MedPro Group

PARALLEL SESSIONS 6A – 6E

10:30 – 12:00  6A: Invited Session 4: Industry – Academic Cooperation    Auditorium – Room 152
Runhuan Feng, PhD, FSA, CERA – Professor at University of Illinois in Urbana-Champaign
Sara Teppema, FSA, MAAA – President. Alta Advisors
Andrew Cairns, PhD, FIA - Heriot-Watt University and Actuarial Research Centre of the Institute and
Faculty of Actuaries
Edward Furman, PhD - Professor at York University
Thomas Totten, PhD, FSA – Nyhart and University of Notre Dame

6B:    Chair: Chris Groendyke    Room 157
The Pearson System of Frequency Curves: An Analysis of the Distribution of the Returns on Stocks, by
Natalia A. Humphreys, The University of Texas at Dallas

Negative Marginal Option Values: The Interaction of Frictions and Option
Exercise in Variable Annuities, by Thorsten Moenig, Temple University

Modeling and Reserving for GMMB using Representative (Pivot) Scenarios in R for Variable Annuity, by
Yvonne C. Chueh, Central Washington University
6C Chair: Gary Dean  Room 159
Premium optimization with policyholder loyalty, by Himchan Jeong, University of Connecticut
On Algorithms for Testing Membership of Tail-Dependence Matrices, by Siyang Tao, University of Iowa
On optimal hybrid dividend strategies for diffusion processes, by Hayden Lau, University of New South Wales

6D Chair: Louis Adam  Room 160
DSA Algorithms for Mortality Forecasting, by Yechao Meng, University of Waterloo
A Semiparametric Method for Assessing the Quality of Life Expectancy Evaluations, by Hong Beng Lim, University of Iowa
A Flexible Phase-Type Aging Model, by Boquan Cheng, Western University

6E Chair: Wei Wei  Room 162
Gompertz Law Revisited: Forecasting Mortality in a Multi-factor Framework, by Hong Li, University of Manitoba
A Historical Mortality Study Using 18th Century Naval Records or Using Actuarial Models to Prove Dr. Johnson Wrong, by Peter Douglas, University of Regina
Scenario Weights for Importance Measurement - An R package for sensitivity analysis, by Silvana Pesenti, University of Toronto

12:00 – 1:00 Lunch   Indiana State Museum
Sponsored by Lincoln Financial Group

1:10 – 1:25 Presentation by CAS President-Elect Steve Armstrong
Introduction by Gary Dean, Planning Committee

PARALLEL SESSIONS 7A – 7E

1:30 – 3:00  7A: Invited Session 5: Catastrophe Modeling and Insurance   Auditorium – Room 152
Steve Kolk, ACAS – Kolkulations
Michael Angelina, ACAS – Saint Joseph's University
Graham Hall, FIA – Pricewaterhouse Coopers
Qihe Tang, PhD – University of New South Wales

7B: Chair: Natalia Humphreys  Room 157
Optimal Insurance with Belief Heterogeneity and Incentive Compatibility, by Shengchao Zhuang, University of Nebraska – Lincoln
Optimal reinsurance with model uncertainty, by Haiyan Liu, Michigan State University
Affordable and Adequate Annuities with Stable Payouts: Fantasy or Reality?, by Daniel Linders, University of Illinois at Urbana-Champaign

7C Chair: Yvonne Chueh  Room 159
Diversification of bounded risks, by Hengxin Cui, University of Waterloo
Holistic Allocation Principle, by Longhao Jin, University of Illinois at Urbana-Champaign
Model Efficiency and Uncertainty in Quantile Estimation of Loss Severity Distributions, by Sahadeb Upretie, University of Wisconsin - Milwaukee
7D Chair: Breanne Richins  Room 160
Retirement planning with systematic disability and mortality risk, by Mengyi Xu, University of New South Wales

Intergenerational Equity: Metrics for Conditional Indexation in Pension Plans, by Louis Adam, Laval University

Valuation of Risk-Based Premium of DB Pension Plan with Terminations, by Zhixin Yang, Ball State University

7E Chair: Jed Frees  Room 162
Insurance Premium Principles for Dependent Risks, by Wei Wei, University of Wisconsin – Milwaukee

Gaussian Process Models for Actuarial Risk Analytics, by Michael Ludkovski, University of California, Santa Barbara

Cohort-wise mortality prediction under survival energy hypothesis, by Yasutaka Shimizu, Waseda University

3:00 – 3:30 Coffee Break  Student and Faculty Lounge
Sponsored by the SOA Health Section

PARALLEL SESSIONS 8A – 8E

3:30 – 5:00 8A: Chair: Margie Rosenberg  Room 157
Modeling HPI price index using HJM approach, by Vajira Manathunga and Kushantha Fernando, Austin Peay State University

Risk Sharing with Multiple Indemnity Environments, by Wing Fung Chong, University of Illinois at Urbana-Champaign

Blockchain applications in insurance, by Arnold Shapiro, Penn State University

8B: Chair: Tom Edwalds  Room 159
Age Matters, by Phelim Boyle, Wilfrid Laurier University

When Does The 1/N Rule Work?, by Chengguo Weng, University of Waterloo

Hidden Markov Model for Portfolio Management with Mortgage-Backed Securities Exchange-Traded Fund, by Moon Nguyen, Youngtown State University

8C Chair: Runhuan Feng  Auditorium, Room 152
A Dependent Frequency-Severity Approach to Modeling Longitudinal Insurance Claims, by Peng Shi, University of Wisconsin – Madison

Convolutions and Transforms Analysis in Casualty Loss Reserving, by James Ely

Capital Allocation Techniques: Review and Comparison, by Qiheng Guo, University of California, Santa Barbara

8D Chair: Thorsten Moenig  Room 160
Assessing the Public and Private Impact of Retirement Income Products (CIPRs) Allowing for Health Heterogeneity, by Yulong Li, University of New South Wales

Accommodation or Obfuscation? Financial Innovation in the Variable Annuities Market, by Xiaochen Jing, University of Wisconsin – Madison

Comparison of Equity Models and Computational Methods for Variable Annuity Guarantees, by Xiao Xu, University of New South Wales
Joint model for individual-level reserving, by A Nii-Armah Okine, University of Wisconsin-Madison

Impact of individual explanatory variables in loss reserves, by Juan-Sebastian Yanez, Université du Québec à Montréal

Recurrent Neural Network for Individual Loss Reserving in Non-Life Insurance, by Ihsan Chaoubi, Laval University

6:00 – 7:30 Interactive Exhibits, Cocktails and Hors D’oeuvres
Dallara Indycar Factory, 1201 Main Street, Speedway
Sponsored By OneAmerica
Busses Leave at 5:40

7:30 – 9:00 Conference Dinner – Dallara Indycar Factory
Sponsored by OneAmerica

Saturday, August 17 – Conference Day 3

8:00 – 8:45 Continental Breakfast   Student and Faculty Lounge
Sponsored by the Society of Actuaries

9A Plenary Session 3     Chair: Gary Dean     Auditorium – Room 152

8:45 – 9:00 Announcements
Chris Wilson, Planning Committee

9:00 – 10:00 Keynote Presentation: Should Life Insurers Use an Applicant’s Genetic Information?: Policy Lessons from the UK, Australia, and Canada
Anya Prince
Associate Professor of Law and a Member of the University of Iowa Genetics Cluster

10:00 – 10:30 Coffee Break   Student and Faculty Lounge
Sponsored by the Infinite Actuary

PARALLEL SESSIONS 10A – 10E

10:30 – 12:00 10A:   Chair: Carl Cowen    Auditorium, Room 152
Impact of Shocks on Insurance through a Financial Network, by Zhiwei Tong, University of New South Wales
Efficient Dynamic Hedging for Large Variable Annuity Portfolios with Multiple Underlying Assets, by Shuai (Alex) Yang, University of Toronto
Modeling of Persistent Extrema in Financial Markets and Its Implication for Equity-Linked Insurance, by Runhuan Feng, University of Illinois at Urbana-Champaign

10B:   Chair: Alisa Walch    Room 157
A Class of Mixture of Experts Models for General Insurance, by Tsz Chai Fung, University of Toronto
Model misspecification, Bayesian estimator, credibility estimator, and Gibbs posterior, by Liang Hong, Robert Morris University
Comparative Study of Predictive Analytics Algorithms and Tools on Property & Casualty Insurance Solvency Prediction, by Lu Xiong, Middle Tennessee State University
10C Chair: Chris Wilson Room 159
Hybrid Tree-based Models for Insurance Claims, by Zhiyu Quan, University of Connecticut
Tree-based models for individual loss reserving, by Andra Crainic, Université du Québec à Montréal
Territorial Ratemaking Using Moran Basis Functions, by Zach Horton, Brigham Young University

10D Chair: Tom Totten Room 160
Multi-population longevity models: a spatial random field approach, by Nhan Huynh, University of California, Santa Barbara
The County Fair Cyber Loss Distribution: Drawing Inferences from Insurance Prices, by Daniel Woods, Oxford University
Proportional allocations revisited, by Jianxi Su, Purdue University

10E Chair: Zhixin Yang Room 162
An insurance approach to Biosecurity risks, by Atibhav Chaudhry, University of Melbourne
Predicting extreme surges from sparse data using a copula-based hierarchical Bayesian spatial model, by Nicholas Beck, McGill University
Stock Return Forecasting Power of the Actuaries Climate Index, by Ruihong Jiang, University of Waterloo

12:00 Box Lunch
Sponsored by the Canadian Institute of Actuaries
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