CURRICULUM VITAE

November 12, 2016

1. Biographical Information

Name: Xiaoming Liu

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Education:

	University	Department	Year
Ph.D.	University of Toronto	Department of Statistics	2008
M.Sc.	Beijing Normal University	Department of Mathematics	1992
B.Sc.	Nanchang Institute of Aeronautical Technology	Department of Mathematics	1989

ASA: the Associateship of the Society of Actuaries, 2016

Employment History:

2012.7 – Present, Associate Professor, Department of Statistical and Actuarial Sciences, University of Western Ontario, Canada.

- teach and conduct research in Actuarial Sciences.

2006.7 – 2012.6, Assistant Professor, Department of Statistical and Actuarial Sciences, University of Western Ontario, Canada.

- taught and conducted research in Actuarial Sciences.

2006.1 – 2006.4, Sessional Instructor, Department of Statistics, University of Toronto, Canada

- taught second year actuarial course.

1996 – 2001, Lecturer, Department of Information, Renmin University of China

- taught mathematics, statistics and probability;
- assisted the set-up of the Actuarial Examination Center of the Society of Actuaries in the school of Statistics in Renmin University of China in 1995, and taught several actuarial courses there;
- conducted research projects and provided consulting to insurance companies.

1992 – 1996, Assistant Lecturer, Department of Information, Renmin University of China

- taught courses in mathematics, statistics and probability.

Honors:

1997, MetLife Scholarship for Teachers, Renmin University of China

2. Academic History

Research Interests

My research interests lie in the area of Actuarial Science, Mathematical Finance, and Stochastic Processes. In particular, I focus on mortality risk modeling and its related problems such as pricing and risk management of insurance policies with the consideration of different risk factors.

Research Grants:

2016-2018, $20,000, CIA Academic research grant

2014-2019, $55,000, NSERC discovery grant

2013-2014, $25,000, Fields Institute Postdoc Funds for co-supervising Maria Govorun

2012.7	$800	Travel Grant for attending CICIRM2012, Qingdao, China
2011.1	$2,500	Society of Actuaries. Travel Grant for attending Living to 100 Symposium, 2011
2010.12	$800	Travel Grant for attending ASFM2010, Hong Kong
2007-2012	$60,000	NSERC (Natural Sciences and Engineering Research Council of Canada) Discovery Grant-Individual
2007-2008	$34,994	NSERC RTI Grant (with 11 others)
2006-2012	$25,000	Start-up Grant from University of Western Ontario
2006-2007	$9,000	Committee on Knowledge Extension Research, Society of Actuaries. Research Grant (with X. Sheldon Lin)

3. Scholarly and Professional Work and Activities

Articles in refereed journals:

1. Huan Gao, Rogemar Mamon and Xiaoming Liu (2017), “Risk measurement of a guaranteed annuity option under a stochastic modelling framework”, Mathematics and Computers in Simulation, 132: 100-119.

2. Huan Gao, Rogemar Mamon and Xiaoming Liu (2015), Pricing a guaranteed annuity option under correlated and regime-switching risk factors. European Actuarial Journal Volume 5, Issue 2, December 2015: 309--326.

3. Huan Gao, Rogemar Mamon, Xiaoming Liu and Anton Tenyakov (2015), “A regime-switching framework for the valuation of guaranteed annuity options”, Insurance Mathematical and Economics, Vol. 63, issue C: 108-120

4. Xiaoming Liu, Rogemar Mamon and Huan Gao (2014), Pricing a guaranteed annuity option under stochastic mortality and financial risks: A change of probability measure approach. Stochastics. Vol. 86, No. 4, 594–608.

5. Xiaoming Liu, Rogemar Mamon and Huan Gao (2013), A comonotonicity-based valuation method for guaranteed annuity options. Journal of Computational and applied Mathematic 250 (2013): 58–69.

6. Xiaoming Liu (2013), Annuity uncertainty with stochastic mortality and interest rates. North American Actuarial Journal 17(2), 136–152.

7. Xiaoming Liu and Sheldon Lin (2012), A subordinated Markov model for stochastic mortality. European Actuarial Journal 2(1), 105-127.

8. Xiaoming Liu, Jisoo Jang and Sun Mee Kim (2011). An application of comonotonicity theory in a stochastic life annuity framework. Insurance: Mathematics and Economics, 48, 271-279.

9. Xiaoming Liu and John Braun (2010), Investigating Mortality Uncertainty Using the block bootstrap, Journal of Probability and Statistics, Volume 2010, 15 pages.

10. Sheldon Lin and Xiaoming Liu (2007). Markov Aging Process and Phase-type Law of Mortality. North American Actuarial Journal, 11, 92-109.

11. Xiaoming Liu and Hao Yu (2011), Assessing and extending the Lee-Carter model for long-term mortality prediction, 59 pages. SOA Living to 100 Symposium, Jan 5-7, 2011.

Articles submitted in refereed journals:

1. Milos Miljanovic, Yixing Zhao, Xiaoming Liu and Rogemar Mamon (2016), "A computationally efficient algorithm for annuity valuation under correlated risks" submitted to AStA Advances in Statistical Analysis.

2. Maria Govorun, Bruce L. Jones, Xiaoming Liu and David A. Stanford (2014), "Physiological age, health costs and their interrelation", revised and re-submitted to North American Actuarial Journal.

3. Maria Govorun, Bruce L. Jones, Xiaoming Liu and David A. Stanford (2014), “The impact of health cost trajectories on the distribution of physiological age”, submitted to North American Actuarial Journal.

Working papers:

1. David Ding(*) and Xiaoming Liu (2014), Markovian Aging Model for Multi-Cohorts.

2. Matt Bartley(*) and Xiaoming Liu (2013), Two Bayesian approaches to re-fitting a Phase-type mortality model.

3. Xiaoming Liu and Yu Lin(*) (2012), Dynamic Population Structure with Stochastic Mortality and Fertility Rates.

Other Publications

1. Sheldon Lin and **Xiaoming Liu** (2005). Discussion of Ng and Yang's “Lundberg-type bounds for the joint

distribution of surplus immediately before ruin and at ruin under the Sparre-Andersen model", *North American Actuarial Journal,* 9(2), 102-107.

2. **Xiaoming Liu** (2008), Ph.D. thesis: Stochastic Mortality Modelling. University of Toronto

Invited talks at professional meetings/workshops and others:

1. “Longevity risk: past, present and future”, invited talk at Renmin University, Beijing, China. June, 2016.
2. “Maximum Likelihood Estimation for Markov Aging Mortality Model”, invited talk at 2015 BIRS/CMO workshop. October 25-30, 2015 at Oaxaca Mexico.
3. “Physiological Age, Health Costs and their relationship”, invited plenary talk at the 2014 China International Conference in Insurance and Risk Management (2014 CICIRM), Shenzhen, China, July, 2014.
4. "Aging Process and Stochastic Mortality Modelling", invited talk in University of Lausanne, Lausanne, Switzerland, May, 2013.
5. "Markov Aging Process and Mortality Modelling", invited talk in KULeuven, Leuven, Belgium, March, 2013.
6. "Aging Process and Stochastic Mortality Modelling", invited talk in University of Amsterdam, Amsterdam, Netherlands, Feb. 2013.
7. "Risk modelling and risk management solution for longevity risk", invited talk in Shandong Normal University, Jinan, China, Dec. 2013.
8. "Risk modelling and risk management solution for longevity risk", invited talk in Qufu Normal Univesity, Qufu , China, Nov. 2013.
9. "Aging Process and Stochastic Mortality Modelling", invited talk at Tsinghua SEM dual-week seminar, Beijing, China, Nov. 2013
10. "Risk modelling and risk management solution for longevity risk", Financial Issues in Practice Workshop, China, Jinan, Oct. 2013.
11. "Longevity risk: past, present and future", invited Plenary speaker at 2012 China International Conference on Insurance and risk Management, July 18-21, 2012 in Qingdao, China.
12. The Third Living to 100 Symposium, Society of Actuaries, Orlando, U.S. Jan. 5, 2011
13. International Conference on Applied Statistics and Financial Mathematics (ASFM2010), Hong Kong, Dec. 17, 2010,
14. The 2nd Annual UWO Actuarial Event at London Life, London, Ontario, September 17, 2009.
15. Department colloquium, Department of Statistics and Actuarial Science, University of Western Ontario, Ontario, Canada. Jan. 2008

Contributed talks at professional meetings/workshops and others:

1. The 6th International Gerber-Shiu Workshop, Beijing, China, June 8-9, 2016
2. The 24th International workshop on Matrices and Statistics, IWMS-2015, Haikou, China, 2015
3. The 18th International Congress on Insurance: Mathematics and Economics, Shanghai, China, 2014
4. The 17th International Congress on Insurance: Mathematics and Economics, Copenhagen, Denmark, 2013
5. The 15th ASMDA 2013 International Conference, Spain, Barcelona (Mataro)
6. ASTIN Colloquium 2013, Netherlands, Den Hague
7. The 16th International Congress on Insurance: Mathematics and Economics, Hong Kong, China,

2012

8. The International Conference on Actuarial Science and Risk Management, Xiamen, China, June 24-26, 2012
9. The 14th International Congress on Insurance: Mathematics and Economics, Toronto, Canada, 2010
10. The 13th International Congress on Insurance: Mathematics and Economics, Istanbul, Turkey, 2009
11. The Third multi-disciplinary symposium of Ontario Chinese Professors, Niagara, Ontario, 2009
12. Power Hours Seminar in the Department of Applied Mathematics, University of Western Ontario, May, 2009
13. The 12th International Congress on Insurance: Mathematics and Economics, Dalian, China, 2008
14. The 11th International Congress on Insurance: Mathematics and Economics, Piraeus, Greece, 2007
15. The 10th International Congress on Insurance: Mathematics and Economics, Leuven, Belgium, 2006
16. Department Seminar, Department of Statistical and Actuarial Sciences, University of Western Ontario, London, Ontario, Canada, January 2006
17. Department Seminar, Department of Statistics and Actuarial Science, University of Waterloo, Waterloo, Ontario, Canada. Jan. 2006
18. The 40th Annual Actuarial Research Conference, Mexico City, Mexico, August, 2005.
19. Graduate Student Seminars, Dept of Statistics, University of Toronto, Nov. 2005.

Member of Scientific Committee

2016 The 6th International Gerber-Shiu Workshop, Beijing, China, June 8-9, 2016
2012 The Longevity 8 conference at the University of Waterloo, Waterloo, Canada

External Reviewer for grant proposals

2016 MITACS, Canada

2014 NSERC Discovery Grant, Canada

2012 NSERC Discovery Grant, Canada

2011 The Research Grants Council, Hong Kong

External Examiner for Ph.D. Thesis

2016 Nikita (Yuzhou Zhang) in the Department of Statistical and actuarial Science at the University of Western Ontario

2016 Lori L. Murry in the Department of Statistical and actuarial Science at the University of Western Ontario

2013 Yanyan (Ivy) Zang in the Department of Statistical and actuarial Science at the University of Western Ontario

2013 Weiwei (Harry) Liu in the Department of Statistical and actuarial Science at the University of Western Ontario

2013 Maria Govorun in the Department of Information at the Universite Libre De Bruxelles

2011 Yanyu Xiao in the Department of Applied Mathematics at the University of Western Ontario

2011 Jun Du in the Department of Computer Science at the University of Western Ontario

Examiner for M.SC. Thesis

2013 Helen Cheyne in the Department of Applied Mathematics at the University of Western Ontario
2012 William Wei Xing in the Department of Applied Mathematics at the University of Western Ontario

Referee for

Applied Stochastic Models in Business and Industry
Asia-Pacific Jounal of Risk and Insurance
Insurance: Mathematics and Economics
North American Actuarial Journal
ASTIN Bulletin
Scandinavian Actuarial Journal
Mathematical Reviews
Environmetrics

Conference Session Moderator for

- The 18th International Congress on Insurance: Mathematics and Economics, Shanghai, Chian, 2014
- The International Conference on Actuarial Science and Risk Management, Xiamen, China, June 24-26, 2012
- The 14th International Congress on Insurance: Mathematics and Economics, Toronto, June 17-19, 2010

4. Teaching and Student Supervision

Postdoctoral Fellows

2013- 2014 Maria Govorun (co-supervised with Bruce Jones and David Stanford)
2009- 2010 Amin Hassan Zadeh (supported with other 5 colleagues)

Ph.D. students

2016.09 - Boquan Cheng
2010.09 - 2014.08 Huan Gao

M.Sc. students and their research projects

2016-2017, Han Liu “TBA”

2015-2017, Soohong Park “Hedging Strategies for Longevity Risk: Longevity Derivatives and Natural Hedging”
2015-2016, Kaiyi Wang “A Modified Aging and Mortality Model”

2014-2015, Yiming Sun, “Maximum Likelihood Estimation for Markov Aging Mortality Model”

2013-2014, David (Yi) Ding, “Markovian Aging Model for Multi-Cohorts”,
Xue Li, “On the dynamic structure of health costs”, 2013-2014
Yuefeng Ji, “Longevity-indexed life annuity”.

2012-2013, Milos Miljanovic, “An efficient annuity valuation algorithm with correlated risks”.
Xin Huang, “Maximum Likelihood Estimation of Phase-Type Distribution”.
Matt Bartley, “Two Bayesian Approaches to Re-Fitting a Phase-Type Mortality Model”.

2011-2012, Minxian Lv, “The Impact of Investment Strategy of DC Pension Plan on Retirement Age Distribution" (Co-supervised with Hao Yu)
Yu Lin, “Dynamic Population Structure with Stochastic Mortality and Fertility Rates"
Defang Wu, “Assessing systematic bias in mortality prediction of the Lee-Carter model" (Co-supervised with Hao Yu)
2009-2010, Yingying Gan, “Modulated Markovian Time Varying Index under the Lee-Carter Framework”.
Sunmee Kim, “Application of comonotonic theory in annuity rate”.
2008-2009, Jisoo Jang, “Stochastic Life Annuity”.
Sirlei Cavassin, “An extension to the Lee-Carter Model” (with Hao Yu)
2007-2008, Bifeng Xie, “Measuring mortality risk based on Lee-Carter model “

Awards won by my supervised graduate students

In 2013, Matt Bartley and Milos Miljanovic won the runner-up award for their presentations at 48th Actuarial Research Conference, respectively.

In 2012, Yu Lin won the runner-up award for her presentation at 47th Actuarial Research Conference, based on her summer research project.

USRA (Undergraduate Student Research Awards) students and their research projects

2009-2010, Paul D’Cruz, “Parameter uncertainty based on stochastic mortality models”.
2008-2009, Juliane Szeto, “Comparing the Lee-Carter and two-factor stochastic mortality models for financial risk measures”.

Other Undergraduate Students

2013-2014, Yang Yang (AS4997Z---undergrad project course), project title: “Mortality study for Canadian New Pension Tables”.
2011, July to Aug., summer research assistant, Defang Wu, “Approximation methods for sums of lognormal random variables”.

Graduate Courses Taught:

2013 – 2015 AS9972B Stochastic Mortality Modelling.
2008 – 2012 AS9990A Stochastic Analysis with Applications in Finance.
2008 – 2011 AS9972B Stochastic Mortality Modelling.
2009 – 2010 AS9980Y Colloquium.
2007 – 2008 AS790A Stochastic Analysis with Applications in Finance.
2007 – 2008 AS772B Mortality Modelling
2006 – 2007 AS790B Stochastic Processes with Applications in Finance and Actuarial Science.

Undergraduate Courses Taught:

2015 – SS3657A Intermediate Probability
2013 – FM2557B Financial Markets and Investment
2014 – 2015 AS3431B Life Contingencies III
2010 – 2012 AS3429B Life Contingencies II
2009 – 2012 AS3431A/B Multi-State Models
2006 – 2008 AS422A Multi-State Models

Undergraduate Courses Taught at the *University of Toronto*:

2006.1-2006.4 ACT427 Introductory Life Contingencies

5. Administrative Duties:

Department of Statistical and Actuarial Sciences, University of Western Ontario

2013-present: Committee Member for Executive Masters in Actuarial Management.

2013-present: member of departmental Graduate Affairs Committee and graduate counsellor

2011 – 2012: member of departmental Graduate Affairs Committee

2009 – 2010: departmental colloquium organizer

2009 – present: member of departmental London Life Scholarship Committee

2008 – 2012: member of departmental Undergraduate Affairs Committee

2006 – 2012: member of departmental Research Committee

2007 – 2009: member of departmental Outreach Committee