Xavier MILHAUD

35 yo, french

Ph.D. in Applied Mathematics, Fully Qualified Actuary

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Current position:
Assistant professor at ISFA (Institut de Science Financiere et d'Assurances), University of Lyon (France).
Researcher at LSAF, research lab in finance and actuarial science (University of Lyon).

RESEARCH

Research interests:

- ✦ Artificial Intelligence, statistical learning and applications to actuarial sciences (pricing, reserving);
- ✦ Policyholder's behaviour in insurance, heterogeneity and stress tests (self-excited processes);
- ✦ Multiperiods ALM projections of insurance companies;
- ✦ Model selection in the context of finite mixture models;
- ✦ Competing risks models and semi-Markovian models for actuarial applications.

Publications:

- ✦ O. Lopez, X. Milhaud, P.-E. Therond, *A tree-based algorithm adapted to microlevel reserving and long-development claims* , ASTIN Bulletin (2019), **49** (3), pp.741-762 ; doi:10.1017/asb.2019.12;
- ✦ X. Milhaud, V. Poncelet, C. Saillard, *Operational choices for risk aggregation in insurance: PSDization and SCR sensitivity*, Risks (2018), **6** (36), pp.1-22 ; doi: https://doi.org/10.3390/risks6020036;
- ✦ X. Milhaud, C. Dutang, *Lapse tables for lapse risk management in insurance: a competing risk approach*, European Actuarial Journal (2018), **8** (1), pp.97-126 ; doi: https://doi.org/10.1007/s13385-018-0165-7;
- ✦ O. Lopez, X. Milhaud, P. Therond, *Tree-based censored regression with applications in insurance*, Electronic Journal of Statistics (2016), **10** (2), pp.2685-2716;
- ✦ F. Barsotti, X. Milhaud, Y. Salhi, *Lapse risk in life insurance: correlation and contagion effects among policyholders' behaviors*, Insurance: Mathematics and Economics (2016), **71**, pp.317-331;
- ✦ Milhaud, X., *Exogenous and endogenous risk factors management to predict surrender behaviours*, ASTIN Bulletin (2013), **43** (3), pp.373-398, doi: 10.1017/asb.2013.2;
- ✦ S. Loisel, X. Milhaud, *From deterministic to stochastic surrender risk models: impact of correlation crises on economic capital*, European Journal of Operational Research (2011), **214** (2), pp. 348-357;
- ✦ X. Milhaud, V. Maume, S. Loisel, *Surrender triggers in Life Insurance: what main features affect the surrender behavior in a classical economic context?*, Bull. Français d'Actuariat (2011), **11** (22), pp. 5-48;
- ✦ Article de vulgarisation: X. Milhaud, M.-P. Gonon et S. Loisel, *Les comportements de rachat en Assurance Vie en régime de croisière et en période de crise*, Risques (2010), **83**, pp. 76-81.

Working papers:

- ✦ D. Pommeret, X. Milhaud, Y. Salhi, P. Vanderkerkhove, *Mixture components comparison test*;
- ✦ O. Lopez, X. Milhaud, *Claim amounts subject to large reporting delays for individual reserving*;
- ✦ C. Genest, X. Milhaud, *Aggregating correlated loss triangles, a credibility approach*;
- ✦ X. Milhaud, *Excess-of-loss reinsurance and credibility premiums.*

Invitations:

- ✦ Invited speaker at the 11th Actuarial Science and Finance Conference, Samos (Greece), 05/2020;
- ✦ Invited talk at University of Barcelona (Actuarial Sciences department), 03/2020;
- ✦ Invited talk at CASS Business School, London (UK), 01/2020.

Ph.D. students:

- ✦ Pierre Chatelain, on *integrating data quality into pricing processes*;
- ✦ Jean Brunet, on *designing a fully integrated reserving process.*

Main talks:

- ✦ *Truncation and reporting delays in reserving*, 7th SMIF Conference, Maresias (Brazil), 03/2020;
- ✦ *A tree-based algorithm adapted to claims with long development*, IME Conference, Munich, 07/2019;
- ✦ *Surrender tables for ALM in insurance, with competing risks*, EAJ Conference (Leuven), 09/2018;
- ✦ *Operational choices for risk aggregation: PSDization, SCR sensitivity*, Conf. IME (Sydney), 07/2018;
- ✦ *Risk aggregation in insurance, the use of genetic algorithms*, 10th CASF Conference (Samos), 06/2018;

✦ *Lapse tables for lapse risk management in insurance*, ANR LoLitA Conference (Paris), 01/2018;
✦ *Microlevel reserving with Machine Learning, a comparison*, Colloquium AAI (Barcelone), 10/2017;
✦ *Experimental lapse tables for lapse risk management*, ASTIN Colloquium (Panama City), 08/2017;
✦ *Weighted decision trees applied to reserving in insurance*, EAJ Conference (Lyon), 09/2016;
✦ *Tree-based estimators for censored observations with actuarial applications*, 12$^{\text{th}}$ ICOR (Cuba), 03/2016;
✦ *Stress tests for lapse risk: correlation and contagion among policyholders' behaviours*, Colloque CIRM Copules - Extrêmes - Actuariat (Marseille), 02/2016;
✦ *Mass lapse scenario in insurance, a dynamic contagion process*, Sém. L^2 (Lausanne), 11/2015;
✦ *Prediction of contract lifetimes*, Longevity 11 Conference (Lyon), 09/2015;
✦ *Rachats de contrats d'assurance et Solvency 2*, Assoc. Française de Gestion Actif-Passif (Paris), 03/2015;
✦ *Corrélation et contagion comportementale*, Chaire ACPR Risques Systémiques (Paris), 01/2015;
✦ *Surrenders: risk factors, modelling*, Autorité du Contrôle Prudentiel et de Résolution (Paris), 11/2014;
✦ *Tree estimators in censored regression: application to reserving*, EAJ Conference (Vienne), 09/2014;
✦ *Selection of GLM mixtures with a clustering approach*, MBC^2 Workshop (Catane), 09/2014;
✦ *Regression trees and duration models*, école d'été de l'Institut des Actuaires (Paris), 07/2014;
✦ *Clustering with mixtures of GLM*, 46$^{\text{ème}}$ Journées de Statistique (Rennes) 06/2014;
✦ *Whole life contract lifetime: prediction of lapses*, Conférence IME (Copenhague), 07/2013;
✦ *Surrenders and competing risks by [FG99]*, AFIR/ERM - LIFE - PBSS Conference (Lyon), 06/2013;
✦ *Modelling the heterogeneity of surrender behaviours with GLM mixtures*; AFIR Conf. (Mexico), 10/2012.
✦ *GLM Mixture to manage the surrender's behaviour modelling*, IME Conference (Trieste) 06/2011.

Other academic activities:

★ 2020-2025: holder (with K. Antonio, KU Leuven) of the research project *DIALog*, CNP Assurances;
★ Referee at Journal of Applied Probability, Scandinavian Actuarial Journal, Insurance: Mathematics and Economics, ASTIN Bulletin, Risks, European Actuarial Journal, Journal of Statistical Software, European Journal of Operational Research, Bulletin Français d'Actuariat;
★ 2017-today: editorial board member at *Risks*;
★ 2015-2017: member of the Cardif Research Chair *DAMI* (Data Analytics and Models for Insurance);
★ 2014: organizer of the summer school of the french Institute of Actuaries;
★ 2013-2017: member of the ANR (National Research) project *LoLitA*;
★ 2009-2011: member of the ANR (National Research) project *AST&RISK*.

Distinctions:

★ SCOR Award (best PhD in Actuarial Science), 2013;
★ Best paper award (IAALS section) in AFIR/ERM-ASTIN/IAALS colloquium, Mexico City, 2012;
★ Lloyd's Science of Risk runner-up prize with Stéphane Loisel, 2011.

TEACHING

Academic (lectures and tutorials):

✦ *Data Science and statistical learning in actuarial science*, 37h, Master 2 in Actuarial Science (ISFA);
✦ *Advanced methods for pricing/reserving in non life insurance*, 34h, Master 2 Actuarial Science (ISFA);
✦ *Modelling policyholder's behaviour in life insurance*, 8h, Master 2 Actuarial Science (ISFA);
✦ *Resampling techniques, bootstrap and applications*, 12h, Master 1 Actuarial Science (ISFA);
✦ *Introduction to R language*, 12h, L3 and Master in Econometrics and Statistics (Univ. Lyon 1);
✦ *Econometric models for pricing in insurance*, 20h, Master 2 Actuarial Science (ENSEA, Abidjan);
✦ *A posteriori VS a priori pricing*, 20h, Master 2 Statistics (Univ. Cheik Anta Diop, Dakar);
✦ *Generalized Linear Models in insurance*, 6h, Master 2 in Actuarial Science (ISFA, Univ. Lyon);
✦ *Credibility theory and applications*, 20h, Master 2 in Actuarial Science (Intern. Univ. Rabat, Marocco);
✦ *Stochastic reserving in non-life insurance*, 18h, Master 2 IMSA (Univ. Aix-Marseille, Marseille);
✦ *Risk Theory*, 20h, Master 1 in Finance and Actuarial Science at ENSAE ParisTech (Paris);
✦ *Statistical tools to model lapse risk*, 4h; Master 2 MO (hereafter denoted by M2MO, Univ. Paris VII);
✦ *Non-parametric and parametric estimation of copulas*; 6h; M2MO (Univ. Paris VII, Paris);
✦ *Statistical inference*, 4h, Master 1 (tutorials at ENSAE ParisTech).

Work trainings in actuarial science:

✦ *Understanding and modelling the operational risk in finance and insurance*, 14*h*;
✦ *Non-life insurance mathematics: pricing and reserving techniques*, 14*h*;
✦ *Statistical tools for analysing Big Data with actuarial applications*, 14*h*;
✦ *Advanced pricing methods in non life insurance*, 16h;
✦ *Deterministic and stochastic reserving for aggregated loss triangles*, 14*h*;
✦ *Operational risk in insurance: theory and practice*, 14*h*;
✦ *Using the best open-source statistical software: R*, 16h.

EXPERIENCE AND PROJECTS

[2019-2024] Co-holder of the Research Chair *DIALog* (CNP Assurances), with Katrien Antonio;

[2016-today] Assistant professor at Institut de Science Financière et d'Assurances (Institute of Finance and Actuarial Science, Univ. Claude Bernard Lyon 1). Affiliated to the research lab "Sciences Actuarielle et Financière" (LSAF);

[2018-today] Creation, follow-up and coordinator of the Master program in Actuarial Science at Institut International des Assurances (IIA Yaoundé, Cameroun), with S. Loisel;

[2014-today] Partnership at Master level in Actuarial Science with ENSEA : creation, selection, follow-up and teaching at ENSEA Abidjan (African Excellence Center in Statistics, Ivory Coast).

[2016-2018] Co-responsible for the actuarial program at Centre d'Etudes Actuarielles. Continuous training at the Institute of Actuaries. Supervision of actuarial thesis (+40 thesis/year), actuarial program;

[2016-2018] Vice-chair of the steering committee at European Actuarial Journal Association;

[2014-2018] Member of the Board at Institut des Actuaires (IA) (french institute of actuaries, Paris);

[2015 - 2016]: Lecturer at ISFA, University Claude Bernard Lyon 1;

[2011 - 2015] Responsible for the actuarial department at ENSAE ParisTech. Various tasks:
- ✦ teaching, research and supervision of actuarial thesis (+50 thesis supervised);
- ✦ management of the department, in charge of hiring teachers and selecting students, agenda;
- ✦ organization of actuarial seminars on current hot topics (longevity, long term care, Solvency II, ...);
- ✦ organizer and jury of Master defenses (member of IA jury, member of ENSAE jury, +30 defenses/year);
- ✦ go-between ENSAE ParisTech and the french Institute of Actuaries, as well as ENSAE ParisTech and insurance companies or banks offering actuarial internships (discuss and validate actuarial works).

[2008 - 2011] Ph.D. Thesis. In the actuarial department of AXA Global Life. Implemented an RExcel IT tool to model lapse behaviours in Saving business (endowments, general account and unit-linked contracts in Switzerland, USA, Spain). Integrated the dynamic part (impact of financial markets) of lapse behaviours to their structural component.

[2008] Research memoir. (Univ. Laval, Canada); April-Sept. Temporal trends in credibility models (Hachemeister); contribution to the development of the R package `actuar`. Supervisor: Professor V. Goulet.

See also my webpage for further details on personal projects: ☞ http://www.xaviermilhaud.fr/fr/projets.html.

APPLIED MATHS, INSURANCE, FINANCE AND IT SKILLS

Statistics and Probability: statistics and probability theory applied to finance and insurance. Univariate and multivariate descriptive statistics, inferential statistics, tests, model selection. Machine learning and actuarial applications. Stochastic calculus and applications, brownian motion, Ito formula. Correlation (copulas and common shock models). Other research interests: discriminant analysis and clustering, survival analysis, generalized linear models, hidden Markov models.

Finance, Insurance: financial markets; financial theory; corporate finance; risk management in finance and insurance; accounting principles; ruin theory; stochastic models in life and non life insurance, reinsurance theory. Solvency II principles, pillar 1 and pillar 2 (ORSA).

IT: algorithmics, database system and database management, operating system and compilator.

Numerical methods: finite differences methods, partial derivatives equations, numerical approximations (Euler, Crank-Nickolson, Runge-Kutta, ...).

OS / software: Unix, MacOS X, Windows / R, RExcel, Matlab, Scilab, SAS; VBA, C, Java, SQL; LaTeX.

EDUCATION

2013 *Qualification* in both CNU sections 26 (applied mathematics) and 06 (management).
Fully qualified actuary and fellow of the International Actuarial Association (IAA).

2009-2012 *Ph.D. thesis in applied mathematics* at University Lyon 1 and AXA Global Life (AGL). Title: Model selection in GLM mixtures: an application to surrender risk in life insurance. Defended on 7/06/2012, members of the jury: Hansjoerg Albrecher (president), Bernard Garel and Denys Pommeret (referees), Stéphane Loisel and Véronique Maume-Deschamps (supervisors), Vincent Lepez (examinator).

2009-2011 *Actuary diploma* and *Master in actuarial and financial sciences* at Institut de Science Financière et d'Assurances (ISFA, University Lyon 1).

2005-2008 *ENSIMAG engineer* (graduate level school of engineering in computer science and applied mathematics at INP Grenoble) + Research Master (finance and actuarial sciences, at ISFA Lyon).

OTHER INFORMATION

Languages: english, spanish and italian (good level), french (mother tongue).
Sport: tennis (best ranking 2/6), soccer, kitesurf, badminton, ping-pong, and water-skiing.
Travels: lived almost 14 years in Africa, lots of trips in Europe and South America.