european actuarial academy

ANNOUNCEMENT

# EAA Web Session
# Addressing Class Imbalance in Machine Learning

3 November 2025 | 10:00-12:00 CET | online

## Introduction

In both life and general insurance, many predictive modelling tasks involve outcomes that occur infrequently—such as policy lapses, claims, or fraud. This leads to class imbalance, a situation where the target variable's classes are not represented equally in the data, often with one class (e.g. policy lapse) being vastly outnumbered by the other. If not properly addressed, class imbalance can result in misleading classification models that overlook rare but critical events.

This web session will demonstrate how class imbalance in training data can be addressed with Python using a Life Insurance Lapse Prediction Case Study.

**Topics Covered:**

- What class imbalance is, why it matters, and how it affects classification model performance (the 'Accuracy Paradox').
- Step-by-step demonstrations using Python libraries (pandas, scikit-learn, imbalanced-learn) for data preparation, rebalancing techniques, ML model development and model evaluation.
- A range of Rebalancing Techniques, including:
  - Oversampling (e.g. SMOTE)
  - Undersampling
  - Hybrid resampling
  - Cost-sensitive learning
- Application of Rebalancing Techniques across a range of ML classification models, including:
  - Naïve Bayes
  - Logistic Regression
  - Decision Trees
  - Random Forests
  - Gradient Boosting
  - Neural Networks
- A structured evaluation of rebalancing techniques, comparing their impact on model performance using metrics such as:
  - Precision
  - Recall
  - F1-score
  - ROC-AUC
  - Lift

## Participants

This web session is intended for all actuaries, statisticians and data scientists who wish to understand how to address the issue of class imbalance in Machine Learning classification applications. A basic knowledge of Machine Learning concepts and some programming skills (e.g. Python or R) are helpful prerequisites but are not necessary.

## Purpose and Nature

By the end of the seminar, participants will leave with an understanding of how Python machine learning libraries can be used to address class imbalance in training data in order to improve the performance of Machine Learning classification models. Participants will also understand how to evaluate the performance of various rebalancing techniques.

## Language

The language of the web session will be English.

## Lecturer

JENNIFER LOFTUS
Jennifer is an actuary and accountant with over 20 years' experience in the insurance industry. She is an Executive Director, Group CFO and Chief Actuary with Acorn Life in Ireland. She is also an Independent Non-Executive Director of Vhi, the Irish state-owned health insurer. Jennifer is a Fellow of the Institute and Faculty of Actuaries (UK), the Society of Actuaries in Ireland and the Association of Chartered Certified Accountants. She is a member of the IFoA Actuarial Data Science Working Group and is an active member of the Society of Actuaries in Ireland through the Data Science Committee and the Diversity, Equity, Accessibility and Inclusion Committee. Jennifer holds an MSc in Data Analytics and is an Ambassador for Women in Data Science Worldwide.

## Preliminary Programme

Monday, 3 November 2025

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|---|---|
| 10:00-11:00 | Introduction to Class Imbalance & Resampling Techniques |
| 11:00-12:00 | Application & Evaluation of Resampling Techniques |

All the above times are given in CET (Central European Time).

## Fees & Registration

Early Bird Registration Fee (until 22 September 2025):

- For private customers in the EU: €150.00 + VAT of the billing country (example Germany: €178.50 incl. 19% VAT)
- For private customers outside the EU: €178.50 (incl. 19% VAT)

- For businesses within the EU (excl. Germany, with valid VAT ID): €150.00 (net, reverse charge applies)
- For businesses in Germany: €178.50 (incl. 19% VAT)

Regular Registration Fee (from 23 September 2025):

- For private customers in the EU: €195.00 + VAT of the billing country (example Germany: €232.05 incl. 19% VAT)
- For private customers outside the EU: €232.05 (incl. 19% VAT)
- For businesses within the EU (excl. Germany, with valid VAT ID): €195.00 (net, reverse charge applies)
- For businesses in Germany: €232.05 (incl. 19% VAT)

Important VAT Information:

- For private customers with a billing address in an EU country: VAT will be charged at the applicable rate in the country of the billing address. The final amount, including VAT, will be calculated upon invoicing.
- For customers with a non-EU (third country) billing address: Only a non-company billing address is accepted for VAT compliance reasons. 19% VAT applies to all non-EU private customers.
- For businesses within the EU (excluding Germany), Iceland, Liechtenstein, Norway, Switzerland, and the UK with a valid VAT ID: The reverse charge mechanism applies (net price; VAT will not be charged). Please ensure your valid VAT ID is entered correctly during registration.
- For all customers with a billing address in Germany: 19% VAT applies.

Please submit your registration using this online form. Closer to the event, you will receive further login details to join the web session.

Your registration is binding. Cancellation is only possible up to 2 weeks before the first day of the event. If you cancel later, the full participation fee is due. You may appoint someone to take your place but must notify us in advance. EAA has the right to cancel the event if the minimum number of participants is not reached.

We will send you an invoice via email. Please allow a few days for handling. Please always give your invoice number when you effect payment. All bank charges are to be borne by the participant.

Registration is open until two working days before the web session. If registration has already been closed for this web session, please call us or send an email to contact@actuarial-academy.com in order to find out whether a late registration is still possible.

## Technical Requirements

Please check with your IT department if your firewall and computer settings support web session participation (the programme Zoom will be used for this online training). Please also make sure to join the web session with a stable internet connection.

## CPD

For this web session, the following CPD credits are available under the CPD scheme of the relevant national actuarial association:

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| Austria: | 2 points |
| Belgium: | 2 points |
| Bulgaria: | 3 points |
| Croatia: | individual accreditation |
| Czechia: | 2 hours |
| Denmark | 2 credits |
| Estonia: | 2 hours |
| Finland: | 2 points |
| France: | 12 points |
| Germany: | 2 hours |
| Greece: | 3 points |
| Hungary: | 2 hours |
| Iceland: | 2 credits |
| Ireland: | 2 hours |
| Italy: | GdLA individual accreditation |
| Latvia: | 2 hours |
| Lithuania: | 2 hours |
| Netherlands: | approx. 2 points (individual accreditation) |
| Norway: | 2 points |
| Poland: | 2 hours |
| Portugal: | 2 hours |
| Serbia: | 2 hours |
| Slovakia: | individual accreditation |
| Slovenia: | individual accreditation |
| Spain: | CAC: 2 hours, IAE: 2 hours |
| Switzerland: | individual accreditation |
| USA: | SOA (Section B): up to 2.4 hours |

No responsibility is taken for the accuracy of this information.