About the working party

- Working party set up in 2019 by our chair, Sarah MacDonnell

- Over 70 volunteers
  - Actuaries, data scientists and academics from around the globe

- Visit our website
  - https://institute-and-faculty-of-actuaries.github.io/mlr-blog/

- **FAQ section going online shortly after the conference**

Machine Learning in Reserving Working Party   Home   About   Posts   Workstreams   FAQ   Talks   Publications

General Insurance Machine Learning in Reserving Working Party

Latest post

In advance of our simulation engine talk at GIRO 2022, read about the SPLICE data simulator.

- blog post
- GIRO 2022 talk

Upcoming talks

We are giving two talks at GIRO 2022 on November 22:

- Adopting machine learning for reserving – a discussion of frequently asked questions
- Comparison of Simulation Engines for Claims Data

Under construction

We are in the process of revising our website. Many links have changed and some links may be broken.

Please check back in a few days if you run into problems.

Learn more about the working party

Check out our About page for

- information on the working party
- how to join us

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Our workstreams

- In addition to material on each workstream page, we regularly publish blog posts on a number of topic

- Our website also contains details of our future and past talks

  – In particular, Session E4 at 16.35 will cover a *Comparison of Simulation Engines for Claims Data*

Workstreams

Data
Identify data sources for ML reserving

Foundations
Getting started with machine learning

Literature Review
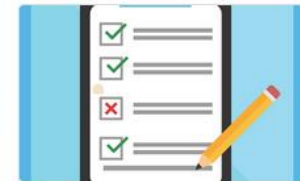Collect published research on Machine Learning in reserving techniques

Practical Considerations
Practicalities on the adoption of ML in reserving

Research
Our research

Survey
Market progress on the use of machine learning in reserving

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Frequently asked questions

The same questions come up time again when we give presentations

- Why should we use machine learning (ML) for reserving?

- What data is available for use?

- How can we incorporate judgement or external information into forecasts?

- How can we get stakeholders on board? How do we explain this to auditors?

- What practical issues should managers consider?

- How do I get started with ML?

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1. Why should we use Machine Learning

- Insight

  – Detect trends earlier

  – Use a wider range of data

  – More accurate results

- Efficiency

  – Free actuaries up to focus on the higher value decisions

- Gains from day one

  – Lots of benefits from the "pre-work"

    • Streamlining data processes

    • Better data collection and governance

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2. What data is available for use?

- Learning ML

  – Your own data

  – Simulation engines (see our other GIRO talk, our website)

- Implementing ML in your reserving team

  – Talk to other teams in your company to find out what data is being collected

    • Pricing, operations, claim functions

  – External data

    • E.g. Weather data, inflation data

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3. How can we incorporate judgement or external information into forecasts?

- In technical ways

  – Offsets, explanatory variables

- Let the machines learn judgement

  – Actuarial judgement is a bit like a neural network in our head – if we can learn it, then the machines can learn some of it too

- Use methods that have a time dimension

  – Time series methods, LSTM (Long Short Term Memory) neural networks

- But always remember that ML models are parameterised on past data

  – Treat ML as part of your skillset, not the entirety of it, and always sense check your results

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4. How can we get stakeholders on board? How do we explain this to auditors?

- Range of explainability techniques available

  – Process to gradually educate yourself and stakeholders over time

  – Start with simpler ML models and quantify the benefits of additional complexity

  – Run regular bite-size information sessions

- Zooming out, consider things from your stakeholders' points of view

  – Target discussion of results to their concerns

- Ease into using ML

  – Make changes incrementally

  – Run traditional and ML reserving side-by-side for a period of time to build confidence with your stakeholders and auditors

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5. What practical issues should managers consider?

- There are challenges

  - Reserving teams work with tight deadlines and often have limited time available

    - Can lead to ad-hoc spaghetti processes, inadequate documentation

- What can managers do?

  - Carve out some time for staff to learn ML and get a keen group to work together

  - Start small – case studies, proof of concepts

    - Improving data governance and processing is often a good win – will benefit traditional processes as well

  - Find cheerleaders

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6. How do I get started with ML?

- Check out material from our [Foundations](#) workstream and this [post](#)

- Pick one of R or Python (e.g. whichever one your company uses)

- Set aside time over a few months and work out a learning pathway

  - Your programming language

  - GLMs -> Regularised regression -> Decision trees -> GBMs -> Deep Learning

- Find ways to use what you learn

  - Use the R or Python chainladder packages and replicate your traditional processes

  - Build a GLM equivalent of a chainladder

  - Try out models on familiar triangular data first, then move to individual data and see if you can improve the results

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Want to read more?

- Check out the FAQ section on our website

  - This will go live around the time of the conference, or shortly after

  - It will contain a detailed discussion of the points raised today

  - We will add to the FAQ over time as new questions and answers arise.

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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenters.

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Thank you

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