

An update from the Machine Learning in Reserving Working Party (MLR WP)

The MLR WP is not presenting at GIRO this year, instead this is a brief update to give you an insight into some of our activities and thinking.

See also this recent webinar from Jacky Poon [Machine Learning in Reserving: Introduction and Recent Developments – International Actuarial Association](#)

Barriers to learning machine learning

The MLR Working Party has long highlighted that one of the biggest barriers preventing reserving actuaries from developing machine learning skills is lack of time and resources.

How we are addressing it:

- Our Foundations Workstream provides a path to gaining competency in common statistical and machine learning techniques: [Foundations – Machine Learning in Reserving Working Party](#)
- We provide sample code in our blogs which are designed to be downloaded so you can experiment and have a go yourself: [From Chain Ladder to Individual Mixture Density Networks on SPLICE Data – Machine Learning in Reserving Working Party](#)
- We offer practical advice too: [4. Practical advice for managers – Machine Learning in Reserving Working Party](#)

But it's not just up to us: In a recent case study NFU Mutual shared how they are actively supporting their actuaries to learn ML: [How One Company is Empowering its Reserving Actuaries to Learn Machine Learning – Machine Learning in Reserving Working Party](#)

What initiatives or support structures have you seen that are helping reserving actuaries build their ML capability?

Research

We are continuing to **research** ML methods on reserving data.

We have developed a **framework** for Neural Networks (NNs) to introduce consistency and allow us to compare results and assess the success of different models. [A practical introduction to using neural networks in reserving on individual claims data – Machine Learning in Reserving Working Party](#)

As part of this we have defined a set of standard diagnostics to encourage comparison of the effectiveness of different approaches. [Neural Network Diagnostics – Machine Learning in Reserving Working Party](#)

To understand why we have focused on NNs see [Data science lab – GBMs or neural networks? – Machine Learning in Reserving Working Party](#).

However, we have not forgotten tree based methods, and we will have a blog coming out soon that compares a GBM and a Neural Network.

We have had some success using time series based NNs, particularly GRUs (Gated Recurrent Networks), so lookout for that output which will include sample code that you can use to experiment on your own data.

We are continuing to investigate data structures, ie how to organise the data going into a model and what impact this has on different approaches.

Our members also continue to devise and try out new approaches behind the scenes.

Join us!

It's a huge project and we have more ideas than manpower to carry them out.

To join simply apply through the IFoA's volunteering page [Volunteer vacancies \(actuaries.org.uk\)](#) (scroll down and look for us under 'Vacancies with a Closing date')

See more of our work:

- IFoA VLE: [Machine Learning in Reserving Working Party: MLR Working Party GITHUB Content](#),
- Our GitHub site [General Insurance Machine Learning in Reserving Working Party – Machine Learning in Reserving Working Party](#)

Keep in touch

- **Communities:** [MLR WP - General Insurance - IFoA Communities](#)
- **LinkedIn:** [IFoA General Insurance Machine Learning in Reserving | Groups | LinkedIn](#)

I'd like to end with a thank you to my fellow wp members. It continues to be a real pleasure to work with such a bunch of creative, motivated and knowledgeable, actuaries, data scientists and researchers. I am continually learning so much, and it's a joy pooling our ideas and experience - many heads are indeed better than one.

Sarah MacDonnell (Chair)