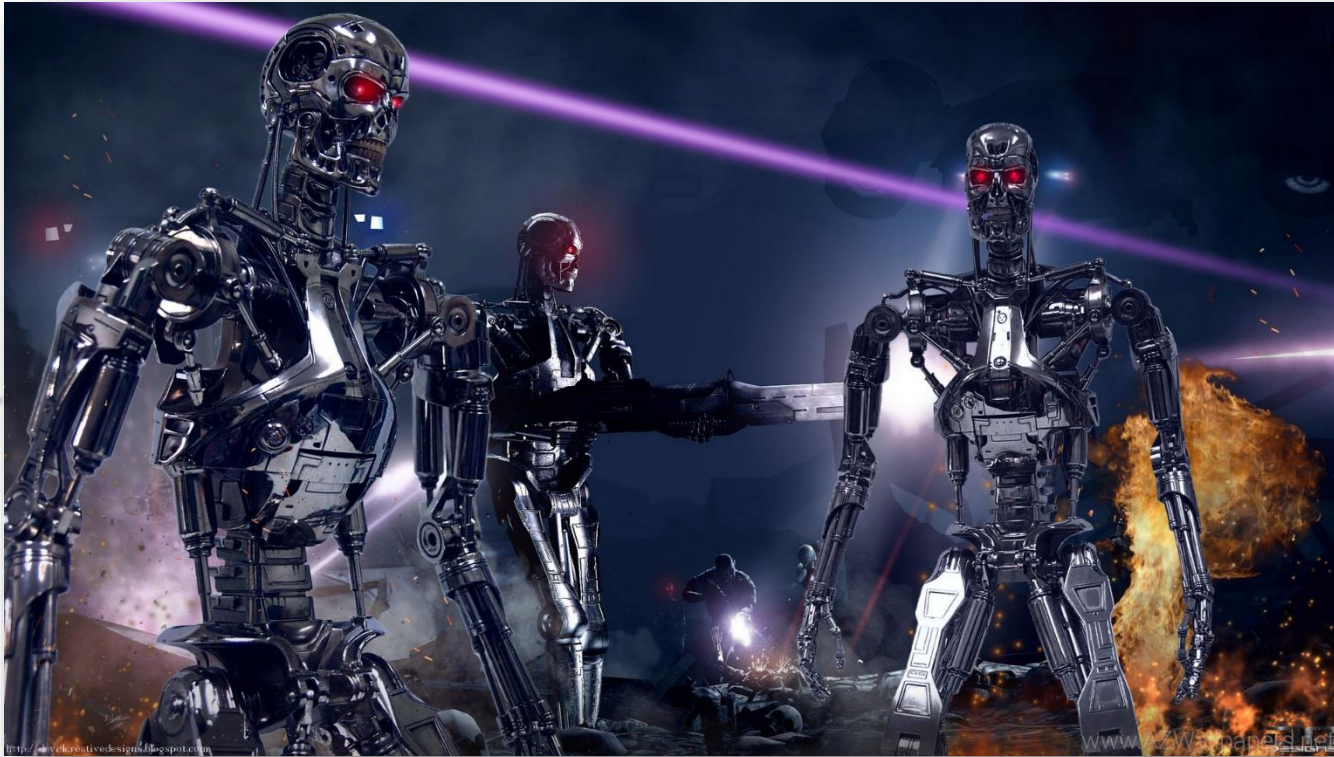




How machine learning is the death of the conventional actuary

Paul-Willem Janse van Rensburg

The year is 2034



What is machine learning and why should I care?



- Not the answer to life, the universe and everything

What is machine learning and why should I care? Continued...

- Subfield of computer science (and statistics)
 - Algorithms
 - Learn and predict from data
- Key tool of a “Data Scientist”
- Hype

What is machine learning and why should I care? Continued...still...



T-800 – The logistic regression killer

- 38 iterations of logistic regression models:

Kaggle	Accuracy
0.79426	0.8361

- Random forest with no tweaking, very little feature engineering:

Kaggle	Accuracy
0.79904	0.9001

T-1000 – The traditional pricing killer

Company	Policy Count	Earned Exposure	Quoted Premium	Sold Premium	Total No. Claims	Assumed Average Claim Size	Gross Earned Premium	Total Claims	Loss Ratio	Contribution
Algorithmic	16,025	7,472	£469.71	£483	1,207	£3,000	£3,605,918	£3,621,000	100.4%	–£15,082
Traditional	17,903	8,416	£469.86	£438	1,238	£3,000	£3,685,595	£3,712,800	100.8%	–£27,205
Difference	1,878	944	£0.16	–£45	31	£0	£79,677	£91,800	0.4%	–£12,123

- 6 rating factors
- Loss Ratio improvement of 0.4% (difference in contribution of £12,123)
- 10% improvement in average premiums and strong levels of contribution

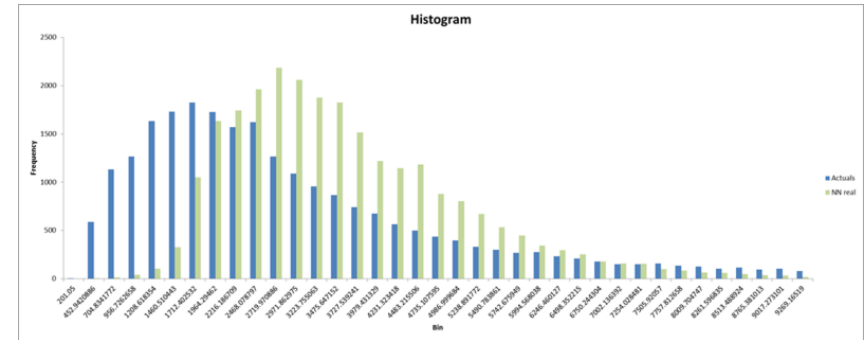
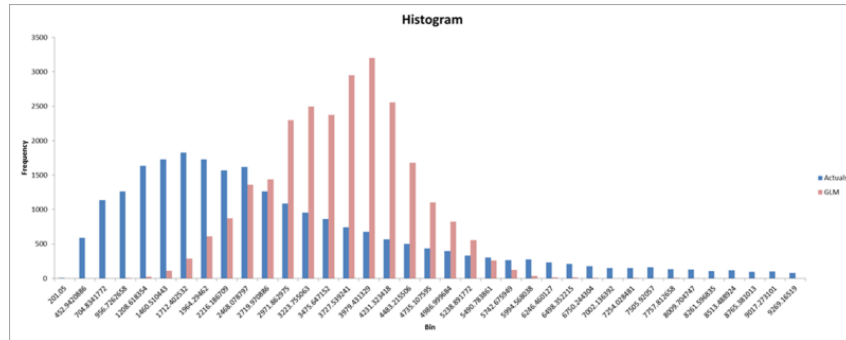
*All Credit to STATCORE Statistical Consulting for their work on Algorithmic Pricing and thanks for allowing me to use their content

This is a gemsbok



T-3000 – The unstoppable killer

Model	Design Matrix	Gamma Deviance		Deviance Improvement	
		Training	Validation	Training	Validation
Null		18,021	7,677		
GLM	Bucketed	16,274	6,950	9.69%	9.47%
GLM	Continuous	16,519	7,006	8.33%	8.74%
Neural Network	Continuous	15,979	6,814	11.33%	11.24%



*Credit to Dr Paul Beinart for providing this information

A swing and a miss

- Banking industry ripe for infiltration/disruption
- Machine learning vs Actuaries
- Not a single actuary employed in an actuarial role at the best bank in the world*

*As rated by Lafferty in its second annual Bank Quality Rankings

