



SOCIETY OF ACTUARIES

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FROM THE EDITOR

Look! Up in the Sky! ... It's Super Actuary!

By Dave Snell



The television series “Numb3rs” was the most popular Friday evening show for its first four (of six) seasons. At first, the idea of a mathematician superhero crime fighter seemed a bit far-fetched. After all, the idea of using tools such as sabermetrics, predictive analytics, neural networks, Kohonen self-organizing maps, Riemann’s hypothesis, and thought experiments such as the prisoner’s dilemma in something as real-world as police work just was not the time-proven way to fight crime.

Then I read the book, *The Numbers Behind Numb3rs—Solving Crime with Mathematics*, by Keith Devlin and Gary Lorden. It turns out that the television series did inject a lot of drama to make the shows popular. However, they were careful to make sure the mathematics used was correct and that the applications were indeed possible. Some episodes were based on actual cases. At least one episode mentioned actuaries.

Surely, it was a stretch for traditional police departments to embrace these new techniques. They had a comfort level with their classical methods, which had been honed and vetted over many years. Why try new methods when the old ones still worked fine for many situations?

It is easy for us actuaries to realize that the initial resistance of law enforcement agencies to new scientific applications of mathematics was naive. We might attribute their reluctance to inertia, fear of the unknown, a less-mathematical orientation and a general resentment of the learning curves involved.

Yet, how many of us are feeling the same kinds of reluctance to try the new complexity science techniques to supplement our tool kit of classical actuarial methodologies?

In this issue, we have articles about some techniques you may consider too academic to be of use in your real-world pricing and valuation models. Yet the fact is that more and more other professions are making the effort to try them—and sometimes they are reaping high tangible rewards for their investment.

Our lead article is about genetic algorithms. In “Are Genetic Algorithms Even Applicable to Actuaries?” Ben Wadsley describes how he has been using them to reduce economic capital requirements. Ben’s article was originally published in the February 2011 issue of the Investment Section newsletter, *Risks & Rewards*, and won the best article award for that issue. Many actuaries have watched us talk about

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Robby the Robot, and how a basic genetic algorithm works; and then they ask “yes, but do you have any actuarial applications?” Ben describes a genetic algorithm that did a better job of bond portfolio distribution for asset-liability management (ALM) than human actuaries did!

Another contribution is from Scott McInturff. He describes the value of collective intelligence in his engaging review of *The Perfect Swarm: The Science of Complexity in Everyday Life* by Len Fisher. Scott’s review cites examples from bee colonies, to UPS drivers, to Wikipedia—a diverse spectrum of applicability for the phenomenon of “group dynamics and the power of a diverse group to apply individual intelligence to produce results superior to that of any individual in the group.”

Min Deng, our co-coordinator of education, writes about the ways she is bringing complexity science into the actuarial curriculum at the university level (“Complexity Science Enters the Actuarial Classrooms”), to give her students a head start on techniques beyond the current actuarial study notes. Her program involves making use of local actuaries to introduce her students to ways they build upon the basics, and extend them for real business advantages.

Frank Grossman is a frequent contributor to the Management & Personal Development Section newsletter; but for us, he has written an engaging article questioning our continued complacency in assuming continual improvement in mortality. In “An Alternate View of Future Mortality,” he provides insightful counterpoint to our customary extrapolation of past improvements. If you are a fan, as I am, of Michael Pollan’s books (such as *The Botany of Desire*), that warn of the dangers of a monoculture food supply, you may find this especially thought-provoking.



Dave Snell

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In my article, “Complexity Science—Simplified,” I have summarized one of our annual meeting sessions: “Complexity Science —What It Is and Why You Want to Know about It.” This was a jointly sponsored session where we teamed up with the Actuary of the Future (AoF) Section and the Health Section; I wrote an earlier version for AoF’s newsletter. The turnout at this session (over 200 attendees) and our follow-up session (with Ben Wadsley and Steve Conwill) drew many more actuaries than we expected—suggesting that a lot of you are at least curious, and perhaps willing to give these new techniques a try.

We are also including the winning article from our Forecasting & Futurism Contest. The goal was to write an article about judgmental forecasting, and Doug King is now the proud winner of an Apple iPad. Read his “Judgmental Forecasting in Determining Policyholder Behavior Assumptions” to see how he successfully incorporated the many judgmental techniques that Alan Mills described in our June 2010 issue.

Ben Wadsley’s Chairperson’s Corner column is upbeat and inspiring—and appropriately so! The section has blossomed over the past year. We are one of the few sections to be increasing in membership; and the increase was significant. Two years ago, we were in danger of dropping below the 500-member threshold to remain viable as a section. Now we are comfortably over 600 members, and still growing.

We are committed to breaking down silos between Society of Actuaries (SOA) sections; and the sharing of ideas and articles with other sections is one aspect of that initiative. Please give all of these articles a try. You may find that you get an idea about how to implement a new technique in a way never thought of before.

Perhaps the next television series can be about a superhero actuary! ▼