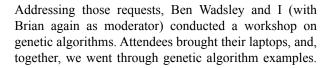Article from:

Forecasting & Futurism

Standing Room Only! Complexity Grows at Annual Meeting

By Dave Snell

I t just doesn't get any better than that! Forecasting & Futurism (F&F), along with Actuary of the Future (AOF) sponsored three sessions on complexity science; and the attendance and audience participation was great. In addition, the Health Section sponsored another session, and it was great too. We have been promoting the new tools and techniques of complexity science for a couple of years now, and 2011 looks like the year when the general membership really took an interest in it.

I was privileged to present the introductory session, "Complexity Science: What It Is Why It Is Important to You." Brian Grossmiller was my moderator and broke the monotony of just me with poignant questions along the way. In 75 minutes we covered deterministic chaos, behavioral economics, predictive modeling, network science, fractals, genetic algorithms and cellular automata, along with the history of classical economics and where it broke away from the association with physics. OK, in 75 minutes we did not actually do much more than touch upon these subjects; but we did give a taste of a little of the world beyond classical actuarial techniques. The reception was very good. This was the fourth SOA big meeting presentation of this overview and we still are finding a lot of interest in the subjects.

Feedback from our previous presentations on complexity science (at the Annual Meeting 2010, Life & Annuity Symposium 2011 and Health Meeting 2011, plus some regional actuarial clubs and university actuarial science programs), though, asked for more depth on a few topics like genetic algorithms and behavioral science.

Addressing those requests, Ben Wadsley and I (with Brian again as moderator) conducted a workshop on genetic algorithms. Attendees brought their laptops, and, together, we went through genetic algorithm examples.

Dave Snell

Dave Snell, ASA, MAAA, is technology evangelist with RGA Reinsurance Company in Chesterfield, Mo. He can be reached at *dsnell@rgare.com*.

The group even broke up into smaller teams, in competition for a copy of Melanie Mitchell's new paperback version of *Complexity: A Guided Tour*. We all learned from each other; and the feedback we heard from participants directly and through tweets (yeah, I did not expect that type of feedback) was enthusiastic. We hope to continue these workshops and expand the number of genetic algorithm converts. At one point in the presentation, I tried to explain genetics 101 (actually 0.001) and made the comment along the way that real genetics is very complex; and we are not God so we have to seriously scale back the micro world of our algorithms. I was particularly amused by one tweet Ben showed me afterwards that stated the takeaway was, "We are not God."

Ben gave a presentation of his asset and liability management (ALM) model that is an excellent actuarial application (see his article about this in our July 2011 issue). Later, we summarized our experience with the "art" of this new science. There are a lot of items that are not cookbook in nature. You have to get involved; and tweak parameters and develop a rough intuitive sense for what will help your robots learn the particular situation more quickly.

Our third offering was on behavioral economics. Our speakers here were Bob Wolf, SOA staff partner, Risk Management, and David Wheeler, a recent graduate in the emerging field of, you guessed it, behavioral economics. Bob quickly showed us how our background and experience led us to incorrect answers when dealing with financial decisions; and David followed up with other examples from the current literature. It was a great mix of industry experience (Bob is not only a member of the Society of Actuaries, but also a fellow of the Casualty Actuarial Society) and academia (David brought the latest teachings from DePauw University); and once again, the attendees enjoyed the mind-opening exercises and left chatting (and tweeting) about this cool new area of complexity science.

The Health Section followed up with still another complexity science offering. Doug Norris, an ASA and Ph.D., gave a presentation on "Modeling Complex Systems in Health Care." He talked about the strengths and weaknesses of complexity science modeling, and how to apply what he called the four archetypal complexity science models—networks, cellular automata, virtual worlds and serious games—to solve actuarial problems in health care.

Obviously, this year saw a turning point in actuarial interest in complexity science. Next year, we hope to see a further expansion. Please be a part of it. Volunteer to show how you are using this exciting new toolset. ▼

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