

MOVING FORWARD WITH COMPLEXITY

**Proceedings of the 1st International Workshop on
Complex Systems Thinking and Real World Applications**

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Complex Systems Thinking and Real World Applications

Edited by

Andrew Tait (Decision Mechanics, UK/US)
Kurt A. Richardson (Exploratory Solutions, US)



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3810 N 188th Ave
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*Moving Forward with Complexity:
Proceedings of the 1st International Workshop on Complex Systems Thinking
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Edited by: Andrew Tait & Kurt A. Richardson

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To Paul...

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Editorial: From Theory To Practice

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Alice Munro (n.d.), the Canadian writer, once said, “The complexity of things—the things within things—just seems to be endless. I mean nothing is easy, nothing is simple.” The more time we spend studying complexity, the more her sentiments are shared. Of course, the very pervasiveness of this complexity is the reason we gravitate towards it—like basin-dwelling moths to the attractor flame. The increasing number of “complexity”-focused journals stands as a testament to the progress that is being made in this young discipline.

Our passion, however, lies in the possibility of releasing all these ideas into the wider ecosystem. While many of the more beguiling concepts have embedded themselves in everyday language, complexity thinking, as a formal discipline, is clearly much less widespread. There are islands of success, but the intellectual tectonic shifts required to make them continents have not been forthcoming.

Why is this? Maybe it’s partially down to the packaging. Complexity thinking is hard. Much of the research draws on sophisticated philosophy. This hinders the broad adoption of the ideas in the professional mainstream. The fact that the amount of research in the area of tools is dwarfed by that in the areas of philosophy and theory serves to compound the problem. A rough analysis of the papers published in the journal *Emergence: Complexity & Organization*, for example, in 2007 shows that less than 10% of them were primarily concerned with the development of tools for practitioners.

There is no doubt that the packaging of complexity into a neat, user-friendly shrink-wrapped “box” is a tall order. It’s difficult enough to just describe the damn thing! Maybe this is because we’ve been gradually increasing the complexity of complexity. As we’ve experienced the failures of the systems engineering paradigm, and seen the limitations of “new reductionism”, our definition of complexity has become increasingly elaborate. Naturally, this has trickled down the pipeline to challenge the tool developers.

But, maybe we can best approach tools from another theoretical direction—and use our understanding of complexity to evaluate and enhance them. Richardson (2008) has discussed the notion of a “modeling culture” where a practitioner uses linear tools in a nonlinear manner. This results in a kind of “cyborg” tool where man is responsible for providing the complex context. However, as complexity researchers, surely we’d like to provide man with more assistance in this area.

In July 2010, a workshop (the *1st International Workshop on Complexity and Real World Applications*) was organized in the UK (Botley, near Southampton) to attempt to further this endeavor. While this edited collection represents the permanent record of that meeting, we hope—no believe—that the bringing together of like-minds to discuss and debate the challenges will pay dividends through subsequent research. We look forward to it with barely contained excitement.

These are early days for this research agenda. We've no doubt that readers will feel some frustration at the lack of "consumer-grade" tools on offer. We'd love to have presented the complexity practitioners' version of Excel to you in these pages. Alas, it was not to be.

However, we, and our complexity colleagues, share your frustrations. This is a vibrant field, and we're only just beginning to see the first shoots. And, let's not forget that the rewards available to those breaking this virgin ground have the potential to be great—always a compelling call to action...

In true complexity fashion, we may have to maintain a broad perspective if we're to track the true impact of complexity thinking and techniques. Just as the field of artificial intelligence has contracted as ideas have been co-opted by other/new disciplines—such as speech processing, collective intelligence and computer-gaming—so the real impact of complexity research may occur in related fields.

One of the most tangible complexity techniques currently in use—and one represented in this volume—is agent-based simulation. Many in that community may not see themselves as complexity scientists, but clearly complexity ideas have had a significant impact on that field.

The first steps on the journey of creating a vibrant community of applied complexity practitioners and tool developers have been taken. Many challenges lay ahead—but, with them a wealth of opportunities.

Let's make the first half of this decade the point where complexity comes of age. We hope that this collection, in some small way, can help to bring that about.

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