

The Vision of Autonomic Computing, Kephart & Chess, IBM Watson

I read this article not long after I finished reading a book that described recent biological discoveries at length. While biologists are likening genetics, and thus life sciences, to the world of computing, this article turns modern biology on its head and asks if computers can be more like life. All in all, this is a well-written article that covers a lot of ground but offers only hints and a scant few references as to current work related to the nascent field to autonomic computing. The point of the paper, it seems, is to make the case for autonomic computing as a “grand challenge.” In my opinion, the authors definitely succeed at this.

One interesting thing about this paper is that although it is a problem that we are currently tackling as a “systems” problem, involving distributed systems, operating systems and network issues, the authors do not describe the areas for future research with any such terms. Most systems designers would probably agree that adaptability is a good thing for today's systems, but I usually hear “heuristics” instead of the term “machine learning” when talking about this. Perhaps a major step in moving toward autonomic systems is to make that leap from systems designers working with simple tools and rules of thumb to working with solid and powerful AI principles and practices.

One thing that bothers me about this paper is that the authors do not really discuss how programmers—not even systems programmers—will need to embrace a new style of programming to make possible an autonomic system. Although I agree that goals and performance should be specified at a high level, somebody has to provide the autonomic elements with the ability to fine-tune system parameters and provide those elements with a notion of what those hypothetical knobs do when turned. In that respect, perhaps we still need programming language innovations that make it simple for programmers to provide such information to higher levels and for autonomic elements to understand

new system tunables as they arise.