

Resume

Crispin Cooper

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Crispin Cooper is a doctoral researcher at Cardiff University, Wales. He is associated with both the Department of Computer Science and the Department of City and Regional Planning. He is currently seeking ways to apply biologically inspired computation, agents and complexity science, within the social sciences and economics. Previously, Crispin spent three years as a Research Associate in Intelligent Systems with the University of York (England). The project on which he was employed aimed to produce a reconfigurable chip which could support evolution and growth of electronic circuits. His work concerned evolutionary applications for this platform, and the development of proposals to expand the system to incorporate unconstrained evolution and artificial life. Crispin gained his first degree in Computer Science from Cambridge in 2002. Please visit <http://www.tropic.org.uk/~crispin/research/> for further information.

I used to research bio-inspired electronic engineering and computer science. I've written a fair bit about this below. However, I've just started a PhD in social science. Specifically, within the School of City and Regional Planning at Cardiff University. This may seem like it bears no relation to my background, but bear with me: it's interdisciplinary research. Once I've learned something about social science, economics and city planning, we'll see where I can apply my existing skills. Depending on your technical background, I might summarize my existing skills either as "genetic algorithms, systems that model biological growth, and learning" or more simply as "artificial intelligence". Unfortunately the latter label has acquired a plethora of meanings, most of which have nothing to do with me, but it suffices for a quick summary I suppose.

Quite what I'll do is anybody's guess. The research is very likely to involve agent-based modelling. Ideas to date have included simulation of sustainable urban growth, disaster management and evolutionary economics. I used to work for the Intelligent Systems Group, University of York, UK. I initially worked on the POEtic project. This is a hardware platform which seeks to unite Phylogenesis, Ontogenesis and Epigenesis - three long words which mean evolution, growth, self-repair and learning. For a few years now people have been playing with hardware that can do all this - mimicking evolution to create circuits which design themselves; mimicking growth to create complex structures and mimicking learning, usually with Artificial Neural Networks (in our case, Spiking Neural Networks). The POEtic project attempted to put everything together.

Oddly enough I was working on some audio applications for this platform. The reasons for this was that (1) they showed off the chip's features quite well, (2) the world of audio technology could do with more of this kind of thing and (3) the interactive aspect of these applications appealed to the funding body. As a progression from this, I proposed a study of unconstrained evolution combined with growth, and hardware artificial life experiments. This has recently been funded although I am now employed elsewhere. I've also had a brief stint as an outdoor pursuits instructor, a maths tutor, a private detective and a software engineer with Cambridge Silicon Radio.

Papers: Cooper, C.; Murphy, D.; Howard, D.; Tyrrell, A. (2006) Singing synthesis with an evolved physical model Audio, **IEEE Transactions on Speech and Language Processing**, Volume 14, (4), :1454 - 1461
Cooper, C. et al. (2006) Using GAs to Create a Waveguide Model of the Oral Vocal Tract. **EvoIASP 2004. Lecture notes in computer science**, ISSN 0302-974 , Springer, Berlin.