Evolutionary Telecommunications: Past, Present and Future

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Telecommunications is a vital and growing area, important not only in its own right, but also for the service it provides to other areas of human endeavour. However, telecommunications, supported by an ever-changing set of technologies and providing an ever-expanding set of services, presents a challenging range of difficult design and optimisation problems. In recent years, there has been increasing interest in the application of evolutionary computation (EC) to these problems, including network design, call routing, signal processing, frequency assignment, wavelength allocation, capacity planning, admission control, network management, and many others. Recognition of the potential of *evolutionary telecommunications*, as this synergy has been styled, has resulted in the formation of ECTelNet, a working group of EvoNet, the ESPRIT-funded European Network of Excellence in Evolutionary Computing, as well as EuroEctel'99, the recent First European Workshop on EC in Telecommunications (Goteborg, Sweden, May 1999).

This GECCO'99 workshop on "Evolutionary Telecommunications: Past, Present and Future" focuses on EC for telecommunications applications, particularly those involving areas unique to telecommunications, such as network design. Its two main aims are to establish the current state of the art in the field, as well as to discuss useful directions for future research in this important area.

The format of the workshop is a series of five talks followed by a panel discussion. The first presentation is on the past and current state of the art in evolutionary telecommunications by Mark C. Sinclair (University of Essex, UK), based on an extensive survey of the evolutionary telecommunications literature over the last twelve years. The subsequent four presentations are on promising future directions for evolutionary telecommunications. Lawrence "David" Davis (Tica Associates) focuses on algorithm ecologies and their application to hard problems in telecommunications. Masaharu Munetomo (Hokkaido University, Japan & IlliGAL) considers EC for adaptive routing in the Internet. George D. Smith (University of East Anglia, UK) discusses EC for radio networks, including frequency allocation and satellite-based mobile communications. Then, Robert E. Smith (University of the West of England, UK) proposes an alternative to more conventional evolutionary telecommunications approaches based on emergent agent-based EC. The concluding panel discussion, chaired by David Corne (University of Reading, UK), addresses future research directions, including questions to the presenters.

References

Sinclair, M.C. (1999), "Evolutionary telecommunications: A summary", Proc. GECCO'99 Workshop on Evolutionary Telecommunications: Past, Present and Future, Orlando, Florida, USA, July 1999

Davis, L. (1999), "Telecommunications and the evolution of algorithms", Proc. GECCO'99 Workshop on Evolutionary Telecommunications: Past, Present and Future, Orlando, Florida, USA, July 1999 (invited)

Munetomo, M. (1999), "Designing genetic algorithms for adaptive routing algorithms in the internet", Proc. GECCO'99 Workshop on Evolutionary Telecommunications: Past, Present and Future, Orlando, Florida, USA, July 1999 (invited)

Smith, G.D. (1999), "Genetic algorithms for mobile and satellite telecommunication systems", Proc. GECCO'99 Workshop on Evolutionary Telecommunications: Past, Present and Future, Orlando, Florida, USA, July 1999

Smith, R.E. (1999), "Embodiment of evolutionary computation in network agents", Proc. GECCO'99 Workshop on Evolutionary Telecommunications: Past, Present and Future, Orlando, Florida, USA, July 1999 (invited)