COMPLEX NETWORKS AND EVOLUTIONAY COMPUTATION

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The application of complex networks to evolutionary computation (EC) has received considerable attention from the EC community in recent years. The most well-known study should be the attempt of using complex networks, such as small-world networks and scale-free networks, as the potential population structures in evolutionary algorithms (EAs). Structured populations have been proposed to as a means for improving the search properties because several researchers have suggested that EAs populations might have structures endowed with spatial features, like many natural populations. Moreover, empirical results suggest that using structured populations is often beneficial owing to better diversity maintenance, formation of niches, and lower selection pressures in the population favouring the slow spreading of solutions and relieving premature convergence and stagnation. Moreover, the study of using complex networks to analyse fitness landscapes and designing predictive problem difficulty measures is also attracting increasing attentions. On the other hand, using EAs to solve problems related to complex networks, such as community detection, is also a popular topic.

This special session seeks to bring together the researchers from around the globe for a creative discussion on recent advances and challenges in combining complex networks and EAs.

Topics

- Complex networks and fitness landscape analysis
- Complex networks and problem difficulty prediction
- Evolutionary dynamics on complex networks
- Evolutionary algorithms based on complex networks
- Community detection using evolutionary algorithms
- Community detection using multi-objective evolutionary algorithms

- Real world applications of evolutionary algorithms based on complex networks