

Topology and Evolution of the Open Source Software Community

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Abstract

The Open Source Software (OSS) development movement is a classic example of a social network; it is also a prototype of a complex evolving network. By continuously collecting developers and projects information from SourceForge for two years, we have sufficient data to infer the dynamic and the structural mechanisms that govern the evolution and topology of this complex system. We use this information in three steps. First, we analyse the empirical data we get from SourceForge to get statistics and topological information of the OSS developer social network. Also we extract the evolution of parameters by inspecting the network by time. This gives us knowledge about what the complex network looks like and data about the characteristics of the system. Second, we generate a data model to model the evolution of this network. Finally we simulate the evolution of the OSS developer complex network using Java/Swarm and tune the simulation to match the real data. In simulation, we used several different model to find the best fit model for real data. These models include random network, scale free network and scale free network with fitness. Through simulation we can also verify our data model for this network and get predictions of the evolution of the complex network.