

From Mirroring to the Emergence of Shared Understanding and Collective Power

Jan Treur

Agent Systems Research Group, VU University Amsterdam
The Netherlands

Abstract

Sometimes the expression ‘like managing a herd of cats’ is used to express the impossibility of a task, for example, in relation to managing a group of researchers. As each person in a group is an autonomous agent with his or her own neurological structures and patterns, carrying, for example, their own emotions, beliefs, and intentions, it would be reasonable to expect that managing any group would be such an impossible task. But surprisingly it is not.

Often, groups – even those of researchers – develop coherent directions and decisions, and, moreover, in some miraculous manner the group members even seem to feel good with these.

In recent years new light has been shed on this seeming paradox. It turns out that in human agents an important cognitive function is available, called mirroring, which at the neurological level is based on mirror neurons. These are neurons which, in the context of the neural circuits in which they are embedded, show both a function to prepare for certain actions or bodily changes and a function to mirror such actions or body states of other persons. The discovery of mirror neurons is often considered a crucial step for the further development of the discipline of social cognition, comparable to the role the discovery of DNA has played for biology, by providing a biological basis for many social phenomena. This has led to a new discipline called Social Neuroscience, which in recent years has shown a very fast development.

In this talk it will be discussed how principles from Social Neuroscience can be abstracted to obtain social agent models at a cognitive and affective level, and one step further to social behavioural agent models. These agent models can be used to perform simulation and analysis of the emergence of shared (empathic) understanding among agents, and collective power of groups developed by shared beliefs, intentions and related emotions.