## Friday, February 21, 2014.

## Paul Van Dooren (Université Catholique de Louvain, Belgium)

## Dynamical Models Explaining Social Balance

**Abstract:**

Social networks with positive and negative links often split into two antagonistic factions. Examples of such a split abound: revolutionaries versus an old regime, Republicans versus Democrats, Axis versus Allies during the second world war, or the Western versus the Eastern bloc during the Cold War. Although this structure, known as social balance, is well understood, it is not clear how such factions emerge. An earlier model could explain the formation of such factions if relationships were assumed to be symmetric initially. We show this is not the case for non-symmetric initial conditions. We propose an alternative model which (almost) always leads to social balance, thereby explaining the tendency of social networks to split into two factions. In addition, the alternative model may lead to cooperation when faced with defectors, contrary to the earlier model. The difference between the two models may be understood in terms of gossiping: whereas the earlier model assumed people talk about what they think of others, we assume people talk about what others did. Why do we observe two antagonistic factions emerge so frequently? Already in the 1950s, social balance theorists showed that a network splits into two factions if only certain triads are present in the network and for long the focus was on finding such factions. More specifically, a network is socially balanced if its triads are socially balanced. In balanced triads friends agree in their opinion of a third party, while foes disagree. Triads that are unbalanced are unstable: all three people have an incentive to adjust their relationships to reduce the stress such situations induce. In reality, we rarely observe a perfect split into factions, but only nearly so. In any case, it remains unclear how this translates into a dynamical model that would lead to social balance. Our goal here is to analyze two such dynamical models that could potentially explain the emergence of social balance.

| Univ. Carlos III de Madrid | Default Data | Department of Mathematics |
|---|---|---|
| | **Time** 11:00 to 12:00 | |
| | **Location** Room 2.2.D08 | |
| | Building Sabatini (2nd Floor) | |

**Address**

Avda. de la Universidad 30
28911, Leganés, Madrid