

# Modeling of dyadic interactions with time delays

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Mathematical modeling of dyadic interactions has not so long history. First paper on the topic by Sergio Rinaldi appeared in 1988, but the most important papers came from the nineties of XX century. Rinaldi and Gragnani (1998) proposed a continuous model of romantic relationships, while Gottman, Murray et al. considered discrete description of marital interactions (1994). Both types of models are built upon the similar assumptions. For both persons (called lovers, spouses, or actors, depending on the context in which we use the specific model) involved in the interactions there is an internal dynamics described by a simple linear model, either continuous or discrete. This linear model reflects the evolution of emotions of the considered person in solitude. Interactions are described by an influence function. This function could be partially linear (as in the Gottman-Murray model) or non-linear (as in most papers by Rinaldi and his collaborators). In both models all reactions are assumed to be instantaneous. However, people can be reflexive and react with some delays. Therefore, in my studies I have considered both type of models with time delays. In my presentation I would like to summarize the results of analysis of the models with time delays appearing in various terms in the models.

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