

# Special Issue

## COMPUTATIONAL MODELS FOR INTERETHNIC STUDIES IN TRANSYLVANIA AND BANAT

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### Foreword

The present collection of papers is based on presentations and extensive debates within the framework of an international workshop, entitled “Computational Models for Interethnic Studies in Transylvania and Banat” (Cluj-Napoca, September 27–29, 2012). We organized the workshop as part of a larger project supported by the Romanian National Council for Scientific Research and entitled “*Clash of Civilizations or Peaceful Co-Evolution? Intercultural Contact in the Age of Globalization*”. The project proposes an extensive critique of the principal contemporary theories about intercultural relations, also testing them through ***building various computer-assisted models*** of intercultural conflict and harmony. Given the vast complexity of the topic, we have focused, as a first step, on a few case studies in Banat and Transylvania (and, occasionally, in other Romanian provinces as a third term of comparison), hoping that we can, eventually, extend our research to the entire East Central European region. We have also organized a preliminary ICT workshop, exploring the main theoretical issues and practical challenges involved in the *computer-assisted modeling* of intercultural relations in general and interethnic relations in the East Central European region in particular. The present collection consists of nine research papers, elaborated as a result of that workshop.

1. **Mihai Spăriosu's** paper, "*Computational Models of Intercultural Relations in Banat and Transylvania: Theoretical and Practical Issues*", argues that the process of analyzing intercultural conflict and harmony can successfully combine the qualitative methods of the humanities and the social sciences with the latest analytical and statistical methods from the Artificial Intelligence field of data mining, using entity relation modeling based on entity identification. By way of example, it describes a new method of parallel computation, based on the Quantum Relations Principle (QRP) – an advanced AI method that is an offshoot of general systems theory and is ideally suited for modeling intercultural relations.
2. **Mihaela Malița and Gheorghe M. Ștefan**, in their paper on "*Real Complexity versus Apparent Complexity in Modeling Social Processes*", emphasize the need for a rigorously defined distinction between size and complexity. Starting from a brief review of the domain of dynamic systems with emphasis on the simplicity of their formal description, the authors introduce the concept of apparent complexity. They propose, instead, the architectural approach in dealing with the high phenomenological complexity of social processes.
3. In turn, **Ștefan Trăușan-Matu's** paper, "*The Polyphonic Model and Computer Support Tools for the Analysis of Social Discourse*", describes computer-assisted methods capable of complex, polyphonic discourse analysis. Because most intellectual debates come to us in text form from such materials as books, journals, newspapers, Internet blogs, the author points out that we need analytic tools to go beyond the letter of the text. The polyphonic model makes it possible for the researcher to analyze feelings, gestures and inner thoughts implicit in the text and therefore is an important tool in analyzing complex intercultural discourse at all levels.
4. **Hardy Schloer's** paper on "*The Quantum Relation Principle: Technological Implementation and Real World Application in Intercultural Conflict Detection and Management*" follows up on Mihai Spăriosu's paper, presenting the Quantum Relations Principle (QRP) as a theoretical and practical tool that guides us in building dynamic reality models. These models can measure the interactions of mutual causality among various observers and can make assumptions about how they may behave and affect each other in the future. QRP systems are ideally suited to model, analyze and offer solutions to very complex real-world problems, including interethnic and intercultural conflicts. By way of example, the paper analyzes the recent phenomenon of the "Arab spring" in the Middle East to demonstrate both the predictive and the solution-oriented capabilities of the QRP systems.
5. **Mihaela Malița and Gheorghe M. Ștefan**, in their paper on "*Control Global Loops in Self-Organized Complex Processes*", prove that by extracting simple information from each cell of a cellular automaton (CA) and then globally analyzing it and sending it back to each cell, new, additional behaviors emerge. For

the sake of simplicity, the authors use only one-dimension and two-dimension CA, with one-bit state, to show the effects of a global feedback introduced in a self-organizing system. For more complex CA, such as *The Sugarscape Model*, they suggest several types of loops to control the surviving process of the actors.

6. **Marcel Cremene, Ligia Cremene and Dumitru Dumitrescu**, in their paper, “*A Game Theoretical Perspective on Cooperation in Low-Confidence Environments*”, utilize Computational Game Theory, specifically the *Prisoner’s Dilemma* game, to analyze the emergence of cooperative behavior in a dynamic, unpredictable environment. This game reveals non-cooperation if it is played only once. However, if the game is played several times, the authors point out, the players gradually discover that there is more to gain if they cooperate than if they do not. Models based on this game can then be applied in an intercultural environment where ethnically heterogeneous communities living in proximity find out that cooperation is more advantageous than conflict.
7. In turn, **Mihai Suciu, Nóemi Gaskó and Dumitru Dumitrescu**, in their paper on “*Evolutionary Dynamic for Inter-Group Cooperation*”, follow up on the previous paper and study the emergence and evolution of cooperation between groups using the *Prisoner’s Dilemma* game. Simulations, based on hypergraph representation that ensures a higher flexibility in the sense of the interactions between players, indicate conditions for emergence of intergroup cooperation.
8. **Martin Neumann’s** paper, “*Securitization of the Nation: Simulating the Dynamics of Conflict Escalation on the Case of Former Yugoslavia*”, proposes a computational model of ethnic conflict, based on the 1990s war that led to the break up of the multinational state of Yugoslavia. The model incorporates the theory of securitization with a solid base of empirical data, superseding simplistic explanations of ethnic conflict such as “ancient hatred” or “political manipulation”. It is based on two classes of agents: on the one hand, politicians who fuel the ethnic conflict through bellicose, nationalist speeches and political actions and, on the other hand, citizens who enroll in the local militias, as was the case in former Yugoslavia. The model shows that although politicians are the principal influence factor, citizens are not simply passive entities but contribute, for various reasons (including self-interest), to the outbreak and continuation of the ethnic conflict.
9. **Vlad Jecan, Radu Meza**, in their paper on “*Concept Mapping of Ideological Positioning in Cultural and Political Periodicals in Interbellum Cluj*” use formal concept analysis, with wide applications in fields including data mining, text mining, knowledge management, and semantic web, to analyze and determine the different conceptual hierarchies that were constructed in the interbellum period in Romania by publications belonging to two different cultures: Romanian and Hungarian. The authors conclude that the Romanian periodicals suggest a conservative political positioning, while Hungarian publications refer mostly to a search for adaptation to the new political context, rather than expressing a clear political positioning.

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