UNIVERSITY OF CENTRAL FLORIDA

CENTER FOR RESEARCH IN COMPUTER VISION

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"Groups and complex crowd phenomena: from observations and analyses to innovative models and simulators"

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ABSTRACT

Computer models for the simulation of crowds represent a consolidated type of application, employed on a day-to-day basis to support designers and decision makers. This scenario, however, still represents an interesting opportunity for both researchers focused on the analysis of crowd phenomena as well as for modelers aimed at synthesizing realistic crowd phenomena. In particular, most state of the art models generally do not consider the explicit representation of pedestrians aggregations (groups) and their implications on the overall system dynamics. This talk will clearly define this research endeavor by providing some sample situations in which group presence presents a significant impact on overall system dynamics. Then we will present an adaptive model considering groups as first class abstractions implying a cohesion tendency among its members as a mechanism for the representation of group social interaction. The results achieved in the simulation of sample scenarios will then be given, also comparing them to the most relevant and recent literature. A specific observation was performed with the aim of gathering empirical data about groups within the crowd, for the calibration and validation of the adaptive cohesion mechanism of the model: we will show the preliminary results of an analysis of the gathered data. Finally, we will suggest potential lines of developments integrating the efforts of researches aimed at automatic analysis and synthesis of crowd behavior.

BIOGRAPHY

Full Professor of Computer Science at the Faculty of Physical, Mathematical and Natural Sciences of the University of Milano-Bicocca (ITALY). JSPS Fellow and Guest Professor at The University of Tokyo - RCAST, Research Center for Advanced Science and Technology (JAPAN). Director of the CSAI – Complex Systems & Artificial Intelligence Reseach Center and Director of the PhD School in Computer Science at the Department of Computer Science, Systems and Communication (University of Milano-Bicocca). President of the Spin-off "CROWDYXITY – Crow Dynamics and Complexity s.r.l. of the University of Milano-Bicocca. Research Activity: *Artificial Intelligence* (Knowledge Representation, Engineering and Management); *Complex Discrete Dynamical Systems* (Cellular Automata, Multi-agent System). From 2004 she focused her activity in the field of crowds and pedestrians modeling and simulation to support crowd management in public spaces, recently focusing on the simulation of dynamical formation of groups into crowded spaces and the related influence of multicultural issues (CRYSTALS Project, in collaboration with the RCAST - Research Center for Advanced Sciences and Technologies - The University of Tokyo, Japan, and the Center of Research Excellence in Hajj & Omrah, Umm Al-Qura University, Makkah, Saudi Arabia).