ARCHIVES: Reconstructing past catastrophes through simulation to better anticipate future ones

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Abstract

ARCHIVES is a project in which a methodology to build agent-based models of historical events, in particular crisis events, is proposed. Its goal is to support a better understanding of the relationships between the dynamics of the event itself and the activities of the social actors as they are reported in the documents available, so as to inform contemporary stakeholders that need to manage similar events.

Keyword: geo-historical modeling, agent-based modeling, disaster simulation

1. Geo-historical modeling

It is now widely accepted that the adaptation of human communities to natural hazards is partly based on a better understanding of similar past events and of the measures undertaken by impacted groups to adapt to them. This "living memory" has the potential to improve their perception of the risks associated to these hazards and, hopefully, to increase their resilience to them.

However, it requires that: (1) data related to these hazards are accessible; (2) relevant information can be extracted from it; (3) "narratives" can be reconstructed from these information; (4) they can be easily shared and transmitted. This is classically the task of archivists and historians to make sure that these conditions are fulfilled. However, these last years, a new domain called "Digital Humanities" has brought innovative approaches and methods to undertake these tasks, among which the use of models and simulations in historical research.

2. ARCHIVES project

The ARCHIVES project is part of this new trend. The goal of this French-Vietnamese initiative is to propose a methodology to support the work of the historians, from the analysis of documents to the design of realistic geo-historical agent-based models. Our aim is to let users both visualize what happened and explore what could have happened in alternative "what-if" scenarios. Our claim is that this tangible, albeit virtual, approach to historical fictions will provide researchers with a novel methodology for synthesizing corpuses of documents and, at the same time, become a vector for transmitting lessons from past disasters to a contemporary audience.

In this talk, we will present an implementation of ARCHIVES on the management of floods in Hanoi (Vietnam) around 1926. We will show how this model allows to better understand the decisions that have been taken during those events and the role of the political actors implied in the decision processes, and what light it can shed on today's management of flooding in Vietnam.