

TOWARDS AGENT-BASED SOCIAL SIMULATION AS A METHOD IN LITERARY STUDIES: ANALYZING CREATIVE PROCESSES BASED ON EGODOCUMENTS

Daniel S. Lebherz, Fabian Lorig, and Ingo J. Timm

Center for Informatics Research and Technology (CIRT)
Behringstraße 21
Trier University, 54286 Trier, Germany

ABSTRACT

The use of modeling and simulation (M&S) as scientific method is no longer limited to technical disciplines but has also been established in humanities. However, most of the proposed methods originated from statistical and empirically-driven parts of humanities, e.g., social sciences and economics, while M&S is only rarely applied by literary scientists. In this paper, we present an approach to utilize M&S in literary science for facilitating the analysis of an author's creative processes by means of Agent-Based Social Simulation (ABSS). This is especially challenging, when the subject of investigation, i.e., the author, is no longer alive. In this case, all information required for Agent-Based Modeling (ABM) needs to be identified in and extracted from paperwork written by the author (egodocuments) or about the author. In this paper, we outline how ABM and ABSS can be systematically integrated into the research process in literary studies and what challenges arise.

1 INTRODUCTION

As a scientific method, computer simulation has been established among various disciplines, including humanities. Since the 1990's, simulation is used in social sciences, e.g., to analyze cohesions in social networks (Gilbert 2007). This development can be tracked in the subdomain of *Digital Humanities*, too. Here, scientists explore new techniques for digitalizing as well as analyzing written or printed literature and use digital methods for advancing scientific work in humanities, e.g., literary studies (Burdick et al. 2012). One potential goal is to understand which (personal) circumstances led to successful writing.

Since 2016, the *eXplore!* project, located in Digital Humanities, focuses on answering such questions by means of ABSS (Davidsson 2002). As a project group consisting of three different scientific perspectives – Literary Studies, Data Analysis, and Computer Simulation – our goal is the development of an assistance system for analyzing the (professional) life of the investigated author, based on egodocuments written by the author. To accomplish this goal, we focus on the life of Klaus Mann, a famous German writer and son of Thomas Mann. His detailed diaries from the 1930's comprise many personal and work related information. They seem promising for the project to develop, apply, and evaluate innovative approaches. The resulting research process, which this project pursues, is illustrated in Fig. 1. After the diaries have been systematically digitalized and annotated by means of scientific workflows, all information that is necessary for M&S is analyzed, extracted, and combined accordingly. Finally, a simulation model is created based on this information, a simulation study and respective experiments are executed, and conclusions are drawn from the results regarding the life of Klaus Mann.

2 CHALLENGES

With respect to the generation of reliable results, one of the first substantial steps is the collection of necessary data as well as the development of a valid and credible simulation model (Law 2015). From this perspective, the process yields two main challenges: The first challenge is the development of an assistance

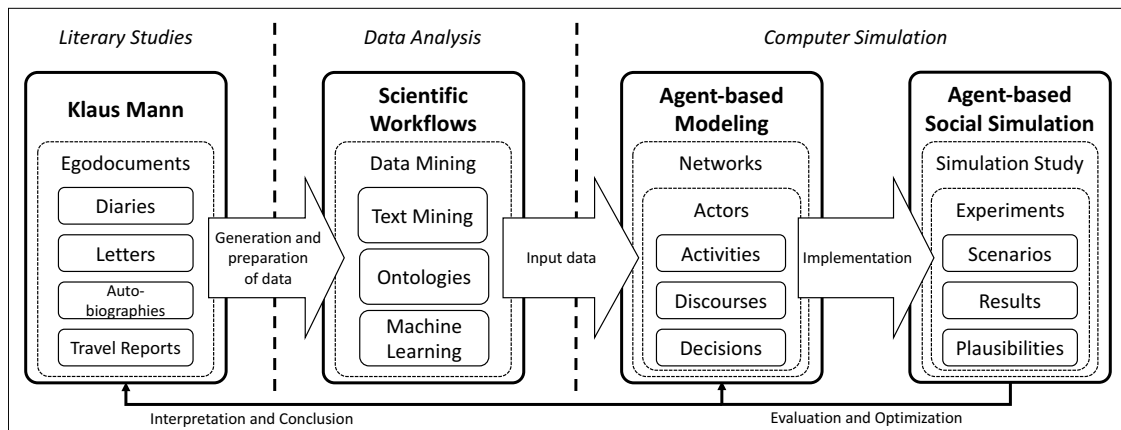


Figure 1: Research process for analyzing creative work using egodocuments and ABSS.

tool, which supports the modeling process by analyzing the annotated text and generating basic input data for the model. First, important information must be identified, e.g., which persons, objects, activities, and discourses influenced the author's life respectively which information is necessary for answering the proposed question. Second, this information needs to be retrieved from the text, in our case, from Klaus Mann's diaries. For this purpose, suitable methods of data mining must be identified, advanced, and integrated in scientific workflows. With respect to reuse, these workflows are stored in a repository. The second challenge is that the approach intends to exclusively use egodocuments as data basis. On the one hand, a lot of information about the author's life is given in this sort of documents. They need to be extracted and sorted properly to create a consistent data basis. On the other hand, this information represents a complex non-accessible system, in which no further information can be collected. Neither expert interviews nor empirical studies can be made to generate missing information.

The proposed question and the identified challenges imply the necessity of an interdisciplinary approach, which is pursued in this project. Literary studies propose a scientific question, which cannot be answered using domain-specific methods. This is because of the complexity and inaccessibility of the object of study. Computer science contributes simulation as a method, which can be applied when the phenomena to be studied is not directly accessible or is difficult to observe directly (Davidsson 2002). Finally, text analysis tools are a powerful support to make the amount of data accessible and usable. They can help approaching the answer and thus support the scientific work in the literary studies. Accordingly, this project affords the opportunity to apply and advance established scientific methods from computer science for the conduction of interdisciplinary research and for answering research questions in literary studies.

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