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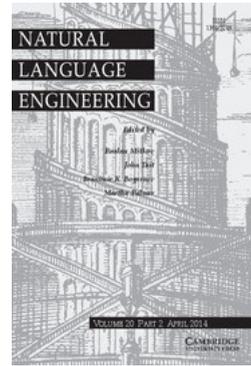
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Inderjeet Mani. *Computational Modeling of Narrative. Synthesis Lectures on Human Language Technologies No. 18.* Seattle, WA: Morgan & Claypool Publishers, 2013. ISBN 978-1-60845-981-0 (paperback: \\$40); ISBN 978-1-60845-982-7 (e-book: \\$30). xvii + 124 pages (doi:10.2200/S00459ED1V01Y201212HLT018).

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Book Review

Inderjeet Mani. *Computational Modeling of Narrative*. Synthesis Lectures on Human Language Technologies No. 18. Seattle, WA: Morgan & Claypool Publishers, 2013. ISBN 978-1-60845-981-0 (paperback: \$40); ISBN 978-1-60845-982-7 (e-book: \$30). xvii + 124 pages (doi:10.2200/S00459ED1V01Y201212HLT018). doi: 10.1017/S135132491300017X

Narrative and stories have been of perennial interest to researchers in artificial intelligence and computational linguistics. The past 15 years have seen a surge of interest in the topic: there have been no fewer than 45 conferences, workshops, symposia, and meetings treating the intersection of narrative and computation.

Into this flurry of activity comes Mani's quite timely book. An easy, concise read, *Computational Modeling of Narrative* provides both a high-level survey of computational narratology, as well as new research by the author in representing information important to narratologists. The book should be read by both technical and non-technical researchers interested in computation and narrative. It is primarily useful for its survey from 30,000 ft. (with the occasional swoop down into more detail); as an advance in the state of the art, the book has less to offer. I will treat these two aims after clarifying the content a reader should expect to encounter in this useful monograph.

1 Structure

Computational modeling of narratives is a broad field, and this book focuses on a fairly clearly defined subpart. In the first paragraph of the Introduction, Mani provides the definition that 'Narratology is a theory of narrative structure, derived from literary criticism', and the book's topic is in fact computational treatments of *narratology*, not computational modeling of narratives in general (as might be expected from an expansive interpretation of the title). Mani aims to provide an overview of the computational work on modeling the structure of stories, along with some relevant new work.

Furthermore, the book explicitly focuses on text-based narratives, leaving aside narrative as found in film, theater, puppetry, dance, animation, games, and any other non-textual media. This focus is understandable, as the vast majority of computational work on narrative structure (and, indeed, narrative in general) has been done in the context of text narratives.

With these two points in mind, the book would have been more informatively titled 'Computational Narratology' or even better yet, 'Computational Textual Narratology.' Topics relating to narratology that have been treated computationally will be found here discussed in broad terms. Chapter 1 reviews key narratological

concepts; Chapter 2 deals with characters, in particular, their plans, goals, and the evaluation of events relative to characters; Chapter 3, on temporal structure, is where Mani really shines, and he goes into considerable detail regarding temporal annotation schemes; Chapter 4, which is a bit confused, deals with models of plot and higher-level narrative structure; Chapter 5 summarizes the book and has some tantalizingly brief pointers toward future work.

A selection of topics that are not covered (but might be expected, based on the title) includes: interactive narrative; narrative in games; narrative generation; style and poetry; world knowledge in the context of narrative; narrative and its relationship to culture; narrative vis-à-vis other forms of discourse; and cognition and narrative.

The book is aimed at both technical and non-technical readers. Technical types such as computer scientists and game developers will find Chapter 1 and portions of Chapter 4 to contain the most material they would not normally encounter, and will appreciate the survey provided by the rest of the book as a jumping off point for further reading. Non-technical types, such as literary theorists and their subspecies, narratologists, will find Chapters 2, 3 and the remainder of Chapter 4 most novel.

The book provides a detailed table of contents and a reasonably comprehensive index. It is part of the Morgan & Claypool Synthesis Digital Library of Engineering and Computer Science, which ‘aims to provide concise presentations of important research topics, published quickly.’ Unfortunately, the ‘published quickly’ shows, with numerous typographical and copy-editing errors, layout problems, and poorly drawn figures. These defects detract from the presentation, but usually do not present a problem, except when the notation is not clearly explained (see the next section). At \$40 for the print copy and \$30 for the electronic version, many will find the book reasonably priced. Those whose institution subscribes to the Morgan & Claypool’s online service will be able to download the book directly for free, making it an even better deal.

2 Reviewing the field

The first aim of the book is to review work relevant to computational narratology. The review is comprehensive, covering four areas at varying levels of detail: narratological concepts, characters, time, and plot. Much of the important computational work relevant to the last three areas is referenced, and so the book is undeniably valuable as a starting point for further reading. Technical readers will be familiar with many of the concepts presented, but few will be familiar in depth with all of the work covered.

Narratologists should find the work valuable for its overview of technical approaches to narratological concepts: the work is written from a technical point of view, Mani having been trained as a computational linguist. Narratologists should be warned, however, that many of the terms and much of the notation in the figures and examples is defined only loosely or not defined at all. Because the book’s review is broad, many bits and pieces of notation from across many works are included,

leaving even the technical reader sometimes feeling slightly lost. I mention this so that this obscurity does not discourage the non-technical reader from forging ahead.

Perhaps Mani's most interesting observation for narratologists is the contrast between, on the one hand, the incredible interest in the structure of character plans and goals shown by computationalists, and, on the other hand, the willful lack of interest in that topic shown in narratological circles. Mani rightly points out that character plan structure is the dual of narrative plot structure and, therefore, one would assume that the 'intentional structure of narratives at the level of agent plans' would be subject to intimate examination by narratologists. Why plans and goals have not excited much narratological interest is a mystery to me, and points to potentially fertile ground for new work.

In the chapter on time Mani comes into his own, as his deepest expertise is in this area. He covers various temporal annotation schemes, the implications of this information for narratological theories, and discusses the different ways of automatically inferring and analyzing temporal relationships. This is a fruitful chapter.

The chapter on plot is slightly more confused, which is not wholly unexpected given the multiplicity of theories and levels of abstraction considered both in computational and non-computational approaches. Mani, nevertheless, does cover all the important bases in this area, even if the presentation lacks an organization that makes the broader themes clear.

3 Advancing the field

The second aim of the book, comprising a significant portion of the exposition, is to advance the state of the art in computational narratology with NarrativeML, a new XML-based annotation scheme intended to capture many the narratological concepts mentioned in the book, as well as character plans and goals, temporal structure, and plot structure.

Here, unfortunately, Mani is on shaky ground. With regard to the temporal structure of the text, I do not doubt Mani's scheme is adequate, as his approach is modeled on the well-known and durable TimeML annotation scheme developed in part by him. However, the rest of his scheme has significant problems.

First is the lack of experimental evaluation of the scheme. Proposing a new annotation scheme is all well and good, and should be encouraged; however, the book presents NarrativeML as a vetted scheme, which it most certainly is not. There is no discussion of actual texts annotated, of measures of agreement between annotators, or of lessons learned from annotating actual, real narratives. Anyone who has gone through the painful process of developing an annotation scheme (which includes Mani himself), knows that trying to fit an annotation scheme to real texts inevitably reveals all sorts of problems, from ill-defined concepts, to incomplete ontologies, to unanticipated structures. If the scheme has not been annotated on real texts, then it must still be considered in the 'proposal' stage.

Beyond this fixable problem there are a number of clear deficiencies in the scheme itself. For example, while I see the value of expressing NarrativeML in XML format

for pedagogical purposes, to make clear the structure of the scheme, as a real-world annotation format it is inadequate. XML does not directly allow overlapping but non-nesting tags. What happens if two character plans, or narrative moves, do not properly nest like Russian dolls, but still overlap? Propp showed as long ago as the 1920s that this sort of structure was quite common for narrative moves. I see no *a priori* reason that it should not be the case for the other sorts of structures Mani tackles.

There are ways around this problem (taken advantage of in TimeML), but they are awkward and negate much of the benefit of using XML in the first place. Fortunately, such a problem is easily fixable by moving to a standoff annotation scheme. More serious problems are those of definition. For example, how exactly does one identify plans and goals in a text? Much of this information will be implicit and not lexically instantiated. Mani proposes that each character be marked as to whether or not the character 'exists' in some overarching sense of the word. However, it is not clear how 'existence' is to be determined, and the concept itself is deeply problematic. For characters he also proposes an 'accessibility set' marking which other characters a character might 'know' about. However, this sort of representation will be adequate only for the simplest narratives that do not involve incomplete information produced by many common processes, including character's perceptual limitations or intellectual inadequacies, lying, and learning new information over time.

Along the way, the book points out many interesting items that Mani promises to discuss in the Future Work section. However, upon arriving triumphantly at the end of the book, the reader finds many of those items not mentioned at all, and the section in general to be disappointingly thin. This strikes me as a lost opportunity for a field trying to find its way in interdisciplinary waters where no clear direction has been provided. Readers hoping for guidance on where to go next will have to look elsewhere.

To conclude, Mani's book is quite useful as a broad review of the literature relating to computational narratology of text, providing, for literary theorists, a high-level treatment of the main technical approaches; and for technical readers a solid primer on narratological concepts, as well as a good survey that will serve as a jumping-off point for further reading. Mani sets out an interesting proposal for a new narrative annotation scheme, NarrativeML, but the work is preliminary. It is nevertheless promising, and readers will no doubt be interested to read about Mani's future investigations into and revisions of the scheme.

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