

Computational Creativity Meets Digital Literary Studies

Edited by

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Abstract

This report documents the outcomes of Dagstuhl Seminar 19172 “Computational Creativity Meets Digital Literary Studies”, held from April 22 to April 25, 2019. Computational Creativity and Digital Humanities are emerging, interdisciplinary fields still experiencing significant growth and development in terms of community, research questions, methods, and approaches. Computational Storytelling as a prominent subfield within Computational Creativity that has mostly focused on planning stories – thus simulating a logically coherent plot – could fruitfully extend its horizon to narrative concepts like narrative style, chronology of narratives, focalization and perspective. These narratological concepts have been investigated by literary scholars for a long time. Yet, operationalization of these concepts is required when used as the basis for computational modelling. This in turn sharpens the definitions of theoretical considerations and can feed back into theoretical discussions in the literary studies. Moreover, there are obvious connection points between Computational Creativity and Natural Language Processing on the one hand, and between Natural Language Processing and Digital Literary Studies on the other hand. However, these connections currently are not transitive. The goal of the seminar was to establish international links between all three disciplines and among involved researchers through presentations by participants and extensive group-work sessions.

Seminar April 22–25, 2019 – <http://www.dagstuhl.de/19172>

2012 ACM Subject Classification Applied computing → Arts and humanities

Keywords and phrases computational creativity, computational narrativity, digital humanities, digital literary studies, storytelling

Digital Object Identifier 10.4230/DagRep.9.4.87

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1 Executive Summary

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Literary studies (LS) is a subfield of the humanities that provides a diversity of possible views on its objects of investigation. The universal approach to literary texts does not exist, instead there are many, sometimes incompatible theories that can be applied for the interpretation of literary texts. Additionally, with the emerging of the Digital Humanities (DH) the deployment



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Computational Creativity Meets Digital Literary Studies, *Dagstuhl Reports*, Vol. 9, Issue 4, pp. 87–106

Editors: Tarek Richard Besold, Pablo Gervás, Evelyn Gius, and Sarah Schulz



Dagstuhl Reports

Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

of computational methods has been introduced into LS, leading to a further expansion of the range of theories and methodologies of text analysis and interpretation. Against that backdrop in the last decade much effort has especially been put into developing approaches that cover rather complex concepts for text analysis, including, among other, network theory (e.g., [7]) and approaches from distributional semantics for topic modelling and word vector estimation (e.g., [8]). This considerably changed the prerequisites of DH research in the field of LS. In many cases it is no longer possible to simply apply a predefined tool or algorithm, requiring traditionally trained LS scholars to move away from their disciplinary paradigm of individual research and towards adapting collaborative modes that can provide both LS and computational expertise. Researchers in Natural language processing (NLP) have shown considerable interest in text-based DH research. This interest is not only motivated by the diversity and complexity of the research questions, which offers an ideal testbed for the development of new methods and combined workflows, but also by the nature of texts found in the context of these research questions which are often diverse with respect to their lexical and syntactic range – meeting the need for this type of data in work aiming for more flexible NLP approaches. Computational Creativity (CC) is a multidisciplinary endeavour, modelling, simulating or replicating aspects of creativity using a computer, in order to achieve one of several ends: Either to construct a program or computer capable of human-level creativity, or to better understand human creativity and to formulate an algorithmic perspective on creative behaviour in humans, or to design programs that can enhance human creativity without necessarily being creative themselves (a concise overview of the main aspects of the field has, for instance, been laid out by [1]). One of CC's most popular subfields is Computational Storytelling (CS), where researchers hitherto have mainly thought about the structure and logical implications of building blocks of stories, leaving most other dimensions of narrative construction out of consideration.

Taking stock of this overall state of affairs and the specific situation in the respective fields, the seminar was constructed around several main challenges:

- One of the major challenges in DLS is the approximation of concepts with computational approaches to, i.e. their operationalization, that not only requires a translation of the concepts, but also a deep understanding of the deployed computational approaches used. This gap can be tackled best by providing expertise from the fields concerned. Whereas NLP is already accepted as such a field (but still needed), CS has not been taken much into consideration yet. A second type of collaboration that still needs to be intensified is the one that connects the interpretative, manual annotations from DLS (e.g., [4]) with computational approaches to text analysis and generation.
- NLP has focused on a limited variety of texts in its beginnings and suffers from a bias towards newspaper texts. Even though there are efforts towards more diverse and flexible text processing, the constant lack of data is a problem. DH and CC offer a variety of texts to improve this situation – but are hitherto underused in that capacity.
- CC, CS focuses almost exclusively on plot and logical structure of storytelling. However, a narrative is a complex web of different factors that are well-investigated in classical disciplines. While much work is based on formalist theories about narrative (especially [9]), other approaches from narrative theory still need to be explored better. For example, CS could benefit from the well-established fields of semiotics (e.g., [5]) and structuralism (e.g., [3]) as well as from more recent, reader-oriented developments in cognitive and empirical narratology (e.g. [6]; [2]).

In order to make researchers from the participating communities a) aware of the challenges and the corresponding opportunities an interdisciplinary meeting like the seminar offered, and b) make them take advantage of these opportunities still on-site, the seminar was split between presentations from researchers describing their recent work and questions they wanted to highlight for the audience, and “hackathon” phases in which decidedly interdisciplinary teams of participants worked on concrete projects.

The following pages summarize the content of these presentations and the outcomes of the group projects.

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3 Overview of Talks

3.1 Generative Modeling: A Unifying Approach to Digital Literary Studies and Computational Storytelling

Leonid Berov (Universität Osnabrück, DE)

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Main reference Leonid Berov: “Steering Plot Through Personality and Affect: An Extended BDI Model of Fictional Characters”, in Proc. of the KI 2017: Advances in Artificial Intelligence – 40th Annual German Conference on AI, Dortmund, Germany, September 25-29, 2017, Proceedings, Lecture Notes in Computer Science, Vol. 10505, pp. 293–299, Springer, 2017.

URL http://dx.doi.org/10.1007/978-3-319-67190-1_23

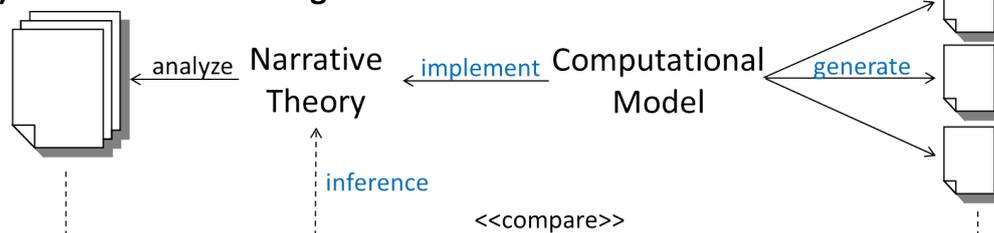
In my contribution I introduce Generative Modeling (GM) as a new method of digital literary studies (DLS) and demonstrate how it allows to incorporate work from computational storytelling (CS) into DLS.

I contrast GM with the prevalent approach to DLS, which I describe as Analytical Modeling (AM). In AM, the goal is to operationalize a narrative theory or concept in a computational model (usually through natural language processing and machine learning approaches), which can then be used to automatically analyze a large corpus of narratives. This allows to automatically test hypotheses, e.g. about the prevalence of certain narratological features during a literary period, and from that draw inferences on narrative theory. In GM, the computational operationalization is one that is using the underlying theory as a source of first principles which are used to (*re-*)generate existing stories (using e.g. multi-agent simulation or planning approaches). By comparing the so generated stories generated with their naturally occurring counterparts, inferences can be drawn on the employed narrative theory.

a) Analytical Modeling



b) Generative Modeling



To exemplify this approach, I present results from generative modeling based on Ryan’s (1991) possible-worlds theory of plot. The modeling was performed by implementing Ryan’s narrative semantics using a Belief-Desire-Intention based multi agent simulation system. Plot, which in Ryan’s theory is a temporally ordered set of actions, happenings and mental events, emerges in this system from the interaction of individual agents and the story world, and

can be captured using a graph representation. This approach uncovered that the employed narrative theory is underspecified with regards to affectivity as well as interindividual differences in fictional characters, which could be solved by incorporating Alan Palmer’s (2004) insights on fictional minds into the character architecture. With this extension in place the resulting generative model was successful in re-creating the plot of the folk tale “The Little Red Hen”. Using the results of this model I demonstrate the three potential contributions GM can make to narrative theory: (1) Raise issues unforeseen at higher level of abstraction, (2) uncover dynamic properties of analytical theories by varying parameters and (3) empirically test predictions.

I then argue that the autonomous generation of stories can be seen as a process that “exhibits behaviors that unbiased observers would deem to be creative” (Colton 2012) if—instead of manually recreating existing stories—new stories are being generated. This demonstrates that GM can be also seen as contributing to research in the field of CS, and is a viable route for exploring how insights from DLS and CS can be mutually benefiting: The role of DLS for CS is to provide computational models of stories, which a creative process can operate on in search of good stories. The role of CS for DLS is to provide means for the exploration of dynamic properties of the constraint space set up by individual narrative theories, by automatically generating stories rooted in these constraints.

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3.2 From Conceptual Blending to Visual Blending And Back

João Miguel Cunha (University of Coimbra, PT) and Amílcar Cardoso (University of Coimbra, PT)

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Conceptual Blending [1] is defined as a mental operation that leads to new meaning by conceptual compression. A blend is a concept that borrows structure from other concepts but has its own emergent structure. This talk presents the basics of how the operation has been computationally implemented by our group, briefly describing Divago [2] and DivagoFlow [3], two incarnations of the same computational approach. Current challenges involve dealing with big knowledge bases that enlarge the possibilities of creating interesting blends [4], but at the same time impose higher performance requirements [5].

On the other hand, Visual Blending concerns the production of visual artefacts by merging existing ones. The combination of Conceptual Blending and Visual Blending, which we refer to as Visual Conceptual Blending [6], attributes a conceptually-grounded nature to the visual blends and has the potential to increase guidance in their production.

We describe the development of a system for the visual representation of concepts through visual blending of emoji – Emojinating [7, 8]. We then focus on how the interaction between the fields of Computational Creativity and Natural Language Processing, addressing how it may lead to further improvement of the system and possible applications.

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3.3 Multilingual Ontologies for the Representation and Instantiation of Annotation Schemes for Folk Tales

Thierry Declerck (DFKI – Saarbrücken, DE)

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Main reference Thierry Declerck, Lisa Schäfer: “Porting past Classification Schemes for Narratives to a Linked Data Framework”, in Proc. of the 2nd International Conference on Digital Access to Textual Cultural Heritage, DATeCH 2017, Göttingen, Germany, June 1-2, 2017, pp. 123-127, ACM, 2017.

URL <https://doi.org/10.1145/3078081.3078105>

In this contribution we summarize past and current work, which started with the development of an annotation scheme for fairy tales, and which was extended to the generation of a large ontology that integrates elements of classical indexation and classification schemes in the broader field of folk tale studies. The resulting structured data set also allows the embedding of fairy tale texts in automated processing scenarios. A development of our work in this area led for example to the automatic recognition of characters in fairy tales, their role in dialogues and their emotions, which serves as the basis for a TextToSpeech scenario that “reads out” fairy tale texts. This result is based on a cooperation with students of Computational Linguistics at the University of Saarland, which took place in the form of Bachelor or Master theses, or also in the form of software projects.

It started with Antonia Scheidel’s master thesis on the annotation of fairy tales with Proppian functions. Antonia Scheidel developed a new annotation scheme, according to which fairy tales can be queried for text properties, temporal structures, characters, dialogues,

and Propp's functions (see <http://www.coli.uni-saarland.de/~ascheidel/APftML.xsd> for the annotation schema, and <http://www.coli.uni-saarland.de/~ascheidel/APftML.xml> for an annotated tale). An annotation scheme is important in so far as automated systems have a goal in which they can map their results. If fairy tales are also annotated manually with the annotation scheme, the results of the automatic processing can be compared with the human annotations.

Building on this, Nikolina Koleva has worked in her Bachelor thesis on an automated system to process fairy tale text (she has worked with 2 examples; "The Magic Swan Geese", an English version of a Russian fairy tale, and "Väterchen Frost", a German version of a Russian fairy tale). She implemented a program that analyses the text according to linguistic criteria, with the aim of identifying the characters in it and storing them in a database. This database is of the "ontology" type: logical operations can be performed in it. The background is a formal description of what can occur in the fairy tales, including an ontology of family relationships. Thus the system can recognize that in the text "the daughter" is the same person as the "sister", if the context suggests this. Recognized characters in the fairy tale are thus assigned to more general categories and can be semantically annotated.

A group of students worked on extensions of the above mentioned works within the scope of a software project. They have extended the annotation scheme with more detailed dialogue descriptions and with the coding of emotions. The ontology has also been extended to include a description of dialogues (questions, answers, monologues, etc.), including the encodings of the participants and the dialogue changes. Also 6 basic emotions (fear, sadness, joy, etc.) are coded in the ontology. A main extension of the past work is that synthetic voices also play a role. Once a character has been recognized, for example the Princess in the fairy tale "The Frog King", additional characteristics are coded (e.g. age, etc.). A previously defined synthetic voice is automatically added to the character. The folk tale can be analysed by the ontology-driven system, which is activating the voices of the different characters (and of the narrator) so that the story can be "told" to the user (see <https://bit.ly/1BDmCZ9> for a link to a resulting audio file).

The next step was realised in the context of two software projects, and consisted in porting two "classical" indexing and classification schemes for folk tales into an ontology. The schemes are the "Thompson-Motif-Index of Folk-Literature" (TMI) and the Aarne-Thompson-Uther classification of tale types (ATU). This work resulted in the creation of a large ontology (containing more than 60000 classes) that is integrating motif elements and broader folk tale types. The TMI ontology is available at: <http://www.dfki.de/lt/onto/narratives/TMI/>.

Finally, the Proppian functions and characters were added to the ontology, with some examples of annotations of folk tale texts included. In this case we added to all the classes of the specific Proppian elements labels in various languages, implementing thus a multilingual ontology that could be used as a knowledge base for multilingual text analysis. The resulting ontology is available at: <https://www.dfki.de/lt/onto/narratives/Propp/>.

3.4 NLP for Narrative Understanding

Mark Finlayson (Florida International University – Miami, US)

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Joint work of Mark Finlayson, Joshua D. Eisenberg, Labiba Jahan, Mustafa Ocal

One of the long-held goals of natural language processing (NLP) is understanding the meaning of narratives. Despite this, there remain many NLP tasks specific or highly useful to narrative that receive very little attention in the NLP community. My laboratory, the Cognac Lab (Cognition, Narrative, & Culture) focuses on solving numerous narrative-specific NLP tasks as steps toward the long-term goals of deeper understanding of culture, cognition, and their relationship. I describe many of these tasks in this talk, and give details of our approaches to and results on four:

1. story detection
2. animacy detection
3. timeline extraction
4. learning Proppian functions

I conclude by noting that computational approaches to narrative have overwhelmingly taken a formalist—and, more broadly, structuralist—point of view, and wonder whether NLP might be profitably applied to other, post-structuralist, modes of literary criticism.

3.5 Open challenges in computational storytelling

Pablo Gervás (Complutense University of Madrid, ES)

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Stories are very present in people's life, and usually in forms much more complex than those contemplated by computational storytelling, which usually focus either on generating new stories from scratch or dynamically adapting an interactive plot to allow for users choices while still leading to endings conceived by an author. People tell stories to get a point or a message across, and decisions on story content and story structure are highly constrained by the point or message in question. The comparison between these two separate views of storytelling indicates a gap that computational storytelling should aim to cover in the near future. Important pending challenges include addressing the layered, structural and multifunctional complexity of discourse (at least to the level described by Genette's work on narrative discourse) and the reflective cyclic nature of the process of writing, revising and validating a draft intended for a particular purpose. Our work for the past twenty years combines the tasks of building satisfactory plots and of composing a narrative discourse. It covers some of Genette's basic features (focalization, time of narration, order or speed) but more work is needed.

3.6 Does Intentionality Matter When Engaging With Computational Storytelling?

Christian Guckelsberger (Queen Mary University of London, GB)

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Joint work of Christian Guckelsberger, Christoph Salge, Simon Colton
Main reference Christian Guckelsberger, Christoph Salge, Simon Colton: “Addressing the “Why?” in Computational Creativity: A Non-Anthropocentric, Minimal Model of Intentional Creative Agency”, in Proc. of the Eighth International Conference on Computational Creativity, Atlanta, Georgia, USA, June 19-23, 2017., pp. 128–135, Association for Computational Creativity (ACC), 2017.
URL http://computationalcreativity.net/iccc2017/ICCC_17_accepted_submissions/ICCC-17_paper_37.pdf

The work of Literary Studies and Natural Language Processing (NLP) has traditionally been based on human-authored literary artefacts. But can we still apply the same methods when working with artefacts generated by Computational Storytelling systems? How robust e.g. is the interpretative framework of Literary Studies with respect to machine-authored artefacts? To provide a solid foundation for the successful collaborations of these three disciplines, this talk focusses on a potential source of disagreement: the importance of intentionality. The dominant position in Literary Criticism is post-structuralist, according to which an author’s intentions should not play a role in the interpretation of their work. We contrast this view with the crucial role of intentionality in Computational Storytelling. More specifically, we identify intentionality at the very basis of artefact creation. Furthermore, we show that intentionality is key to investigate central questions of autonomy and creativity in Computational Storytelling systems, with practical implications for the attribution of authorship and copyright. We use our findings to motivate open questions on the importance of intentionality across all disciplines.

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3.7 Computational Creativity Meets Digital Literary Studies – Thoughts and Experiences in Digital Literary Studies by a Computational Linguist

Jonas Kuhn (Universität Stuttgart, DE)

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Main reference Jonas Kuhn: “Computational Text Analysis within the Humanities: How to Combine Working Practices from the Contributing Fields?” In *Language Resources and Evaluation*. To appear.

The contribution starts out from the relation between inputs (text or spoken utterances) and outputs (some representation of meaning) underlying standard characterizations of the process of analysis or “interpretation” in Linguistics and Computational Linguistics/Natural Language Processing (NLP) – applied to ordinary communicative exchanges. Given a particular utterance context, competent speakers are generally able to select among a (potentially large) set of candidate representations. The process of language generation/production

can be conceptualized as the reverse relation – and again, listeners are able to make a contextually appropriate selection. Empirical data supporting the construction and/or evaluation of models for the processes can be obtained by corpus annotation – when an effective intersubjective operationalization of the underlying conceptual representation is in place. When the context is clear, multiple annotators should generally converge on the same selection among available candidates. It is common to make a distinction among various levels of representation (morphology, syntax, sentence and discourse semantics), even though there are cross-level interactions. Annotated corpora with input/output pairs along these lines have been crucial for a fruitful exchange between Linguistic and NLP work.

In Literary Studies, the texts under consideration do not serve an ordinary communicative exchange. A literary scholar's goal is rather to uncover the significance/meaning/interpretation of a text at a secondary symbolic level – explicitly or implicitly following some framework/theory of literary interpretation. Literary texts are typically assumed to give rise to multiple interpretations (depending on framework, e.g., a psychoanalytical vs. Marxist vs. feminist interpretation framework), which are equally valid. Hence it is not a possibility to copy the forced-choice corpus annotation methodology from linguistic/NLP work. Digital Literary Studies commonly restricts the target of analysis processes to descriptive (narratological) categories that pertain to a relatively “superficial” level of referential text meaning. The contribution laid out how effective target categories can be identified across specific projects, supporting workflows for model building that benefit both Humanities scholars applying the models within a hermeneutic research process and computationalist researchers optimizing the computational models based on suitably representative data (this approach is explored in the Center for Reflected Text Analysis, CRETA, in Stuttgart; compare for example Kuhn, to appear). Intersubjective agreement is hard to achieve at the secondary level of literary interpretation, so most work in Digital/Computational Literary Studies refrains from crossing the level of descriptive text analysis (even though literary theorists emphasize that frameworks of interpretation constrain what is an appropriate interpretation, striving for a systematic account of how to proceed in interpretation).

In its last part, the contribution observes that the reversal of the process of analysis/interpretation – which is essentially being modeled in AI research on Computational Creativity – is not commonly pursued in Digital Literary Studies. However, formalized models that characterize the set of alternative realizations of some underlying (analytical/interpretive) concept could contribute a handle for controlling the space of possible text interpretation: although intersubjective agreement at “deeper”, interpretive levels cannot be expected, the realization sets for a concept under consideration in the course of theory building/refinement take the shape of alternative text variants for a passage in the original primary text. As such, they can be compared (by set intersection etc.) across frameworks and thus avoid at least certain problems of incommensurability. In addition, comparing text variants is a tangible mode for exploring theories – possibly opening up ways for reader experiments/annotation efforts with limited training.

Incorporating a bidirectional view on text analysis/production may thus open up highly fruitful avenues in Computational Literary Studies.

3.8 The LdoD Archive as a creative textual environment and a model of literary performativity

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As both conceptual and technical artifact, the LdoD Archive: Collaborative Digital Archive of the Book of Disquiet contains an innovative model not only for the acts of reading, editing and writing, but also for the reimagination of the book as a network of reconfigurable and dynamic texts and structures [1]. Recreating the textual and fictional universe of Fernando Pessoa's Book of Disquiet according to ludic principles of textual manipulation, the LdoD Archive fosters new reading, editing, and writing practices. Its programmed features can be used in multiple activities, including leisure reading, study, analysis, advanced research, and creative writing. Through the integration of computational tools in a simulation space, it brings together textual production, textual reception and textual analysis in its experimentation with the procedurality of the digital medium. This experimentation is based on a complex ecology of programs, tools and algorithms whose end result can be described as an evolutionary textual environment.

The LdoD Archive has been designed to be a human-assisted reading, editing and writing computational system. The range of collaborative interactions extend from the fully human to the fully automated with various levels of intermediation in between.¹ Interactors experience their actions not only as a series of textual possibilities that emerge from a range of predefined values and parameters, but also as an open exploration of literary performativity itself [2]. According to its simulation rationale, each output is the result of an individual action in which the algorithmic production of the system is modified by intentions and procedures of the interactor. Outputs (whether taking the form of reading trails, edited sequences, classification taxonomies, macro visualizations or new texts) are not entirely determined by the system's internal logic since they will capture the human processing of its programmed processing.

If we think of it in ethical terms, we could say that the LdoD Archive is not a system for automating literary production, reception and analysis. In this respect, it sets itself apart from dominant engineering approaches to computational creativity in artificial intelligence and from dominant digital humanities approaches to textual processing. Rather, its ecology of machine-assisted human action and human-assisted machine action turns algorithmic processes into literary procedures for opening up textual spaces to critical and creative explorations. The result is an evolutionary textual environment fed by the unpredictability and creativity of human interactors in a live, time-distributed and collaborative social process. Its purpose is to instantiate the conditions that allow the reiteration of the relation between potentiality and actuality for each individual role-playing action. Given that this complex computational environment originated in an attempt to model the processuality of bringing a book into existence (in this particular case the Book of Disquiet by Fernando Pessoa), we can say that the bibliographical imagination itself is reconfigured as a physical force in the dynamics that produces the literary as material poetics and social semiotic practice.

¹ Examples related to each of the literary acts that we have modelled in the LdoD Archive: reading can be performed according to the sequence of particular expert editions of the Book of Disquiet, but also according to sequences that are recommended by the system based on various criteria or based on various types of visualization of textual relations; editing can be based on manually arranging texts according to individually established criteria, but also assisted or fully automated by algorithmic processes; writing also ranges from human authored variations derived from Pessoa's texts to fully automated recreations using electronic literature tools (which explore permutation and multimedia integration, for instance).

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3.9 Experiences with MEXICA and the social sciences

Rafael Pérez y Pérez (Universidad Autonoma Metropolitana – Cuajimalpa, MX)

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- Joint work of** Vicente Castellanos, Inés Cornejo
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This talk is divided in four sections:

1. MEXICA and emotional relations as a way to understand the world
2. Representation in MEXICA of emotional relations
3. The Maya’s project
4. Conclusions

One of MEXICA’s main claims is that emotional relations and conflicts between characters are essential for:

- Making sense of the world
- Remembering previous experiences
- Picturing future possible scenarios

Based on such emotional relations, I claim that the MEXICA model can be used to represent and generate narratives about different cultures. To test our claim, we, an interdisciplinary group, are starting a project whose goal is to study the narratives of Mayas that left their towns to immigrate to the USA, worked there and then returned back to Yucatán. We will use such narratives to feed MEXICA and study the new narratives it produces. We believe that this type of interdisciplinary projects will produce novel and interesting knowledge for both, social sciences and computational creativity.

3.10 Adaptation of the Shared Task Format for the Digital Humanities

Nils Reiter (Universität Stuttgart, DE) and Evelyn Gius (TU Darmstadt, DE)

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Joint work of Evelyn Gius, Nils Reiter, Marcus Willand

Our presentation was about the organization of the first Shared Task (ST) to annotate literary phenomena and introducing the approach to the digital humanities as a fruitful format. Generally speaking, teams participating in a shared task propose a solution for the problem determined by the organizers, who evaluate the solutions on a shared (but secret) data set, such that the results are comparable. This makes shared tasks competitive. Particularly in natural language processing (NLP), these research constellations are widespread and a major incentive for progress on important topics such as syntactic parsing. For the first shared task in the digital humanities we have decided on a two-phased approach. The first shared task – “SANTA”: Systematic Analysis of Narrative Texts through Annotation – is dedicated to the creation of annotation guidelines for the phenomenon of narrative levels. The guidelines submitted form the basis for the task of the second shared task: the automated identification of narrative levels based on data annotated according to the guidelines (to be advertised in 2020). By focusing on guideline creation first, we want to make sure that automatic discovery systems employ concepts that are actually relevant (also) for literary studies. In order to facilitate this, we have adapted the work distribution and developed an evaluation procedure covering three dimensions – conceptual coverage, applicability and usefulness. We expect such modified STs to help in addressing many other problems in the humanities, which makes them relevant to the digital humanities by nature. They are particularly appropriate where computational procedures are applied to concepts in the humanities in order to operationalize the latter in an intersubjective negotiation process.

3.11 Computational Literary Studies

Nils Reiter (Universität Stuttgart, DE), Evelyn Gius (TU Darmstadt, DE), and Jonas Kuhn (Universität Stuttgart, DE)

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Joint work of Fotis Jannidis, Evelyn Gius, Jonas Kuhn, Nils Reiter, Christof Schöch, Simone Winko

The talk gives an overview both of the German Research Foundation (DFG) funding instrument of priority programmes as well as a description of the goals, methods and current status of the priority programme *computational literary studies* (CLS). Priority programmes are a funding line for emerging research areas. If a priority programme is funded, a fixed amount of funds is set aside for projects in this area. Individual projects still undergo the regular reviewing process.

The aim of CLS is to systematically enhance our understanding of how formal models can be used in literary studies. The following research aspects are central for the priority programme:

- Identification of methods in computer science and computational linguistics with relevance for the analysis of literary texts,
- Application of existing algorithms to new data sets to generate new knowledge about cultural phenomena, changes and structures,

- Research on existing algorithms to extend them, to find ways to adapt parameters and to improve the understanding of their interaction with literary texts,
- Formal modelling of concepts relevant to literary studies, whereby the depth of formal modelling of literary phenomena is scalable,
- Integration of results of quantitative-empirical research into the qualitative-hermeneutic research process and the formation of theory and concepts.

A central and important property of the priority programme CLS is the interaction and collaboration between funded projects. To foster this, and to also ensure sustainable data management and long term availability, projects will be clustered both according to research objects and methods and regularly meet. Central coordinating positions are also planned.

The priority programme CLS was established in 2018. Individual projects are currently under review.

3.12 Storytelling with Alexa and Nao

Philipp Wicke (University College Dublin, IE) and Tony Veale (University College Dublin, IE)

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Storytelling is a process that reveals how language, interaction and communication between humans can work. We tell stories to inform and to explain, to entertain and transport to other worlds. We use stories to create order in the world and the mass of data it presents us with. While modern technologies provide us with endless opportunities, the need for old-fashioned storytelling becomes ever more pressing. Our project explores a marriage of modern AI techniques and creative performance to use software to generate stories and embodied machines (anthropomorphic robots) to enact them.

The field of computational storytelling is one in many in the relatively new domain of computational creativity. Nonetheless, its serious attempts are as early as 1977, when the TALE-SPIN system was able to generate diverse stories from character profiles or a given morale [1]. Since then, the field has spawned a variety of different story generation systems [2], [3], [4]. Our project considers the pairing of two CC systems in the same thematic area, a speech-based story-teller (with Alexa) and an embodied story-teller (using a NAO robot). Working together, these two compensate for each other's weaknesses while creating something of comedic value that neither has on its own. Both systems perform a double act that is built on a blackboard architecture, allowing them to act on information invisible to the audience. An example performance can be found at <https://bit.ly/2SNeeHQ>.

Future work will investigate the different modalities of the interaction and their contributions to the performance.

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4 Working groups

4.1 Working Group Reports

Evelyn Gius (TU Darmstadt, DE), Leonid Berov (Universität Osnabrück, DE), Mark Finlayson (Florida International University – Miami, US), and Philipp Wicke (University College Dublin, IE)

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Joint work of the entire seminar

The seminar participants split up into working groups for two sessions, one Wednesday in the late morning and one Wednesday afternoon. The group constitution was chosen by the organizers such that participants with diverse backgrounds were represented in all groups. This concept meant to emphasize common difficulties in interdisciplinary work, motivating the participants to develop communication strategies and a feeling for potential issues in interdisciplinary projects in their group phase. Additionally, these different backgrounds should contribute to develop ideas for projects, proposals or road maps for joint ventures of these fields.

4.2 Interprethon

Members: Thierry Declerck, Christopher Hench, Enric Plaza, Sarah Schulz, Philipp Wicke

Summary: This working group first discussed the general definition of well-known open problems such as evaluation in automatic computational creativity but also the focus on interpretation and different literary theories or also a potential lack thereof in literary studies. These discussions led to an idea for a “Call for participation” for an event which could fertilize these two discussed areas which have thus far only been discussed inside of the respective fields by bringing together scholars from both fields. “Interprethon” should aim at bringing together scholars from the Computational Creativity and the Literary Studies communities to offer a platform for cross-fertilization on practical issues as well as discussion and evaluation of literary artifacts created by diverse AI systems. Through a feedback loop between literary scholars and computer scientists discussing and understanding various aspects of the creative process and its outcome, we would expect to learn how to not only improve literary artifact generation systems, but develop a new framework for the analysis of such artifacts – a new type of literary artifact demands updating our traditional methods of literary analysis. An additional result of the event would be the beginnings of informative evaluation techniques of literary artifact generation systems related to audience, values, . . . , etc.. Participants could demonstrate their own use cases and receive feedback from experts with the opportunity to accommodate this feedback to improve the systems utility and value for the literary community. Literary scholars in turn may strengthen and push methods and theories to new limits on novel artifacts becoming increasingly present in our society.

4.3 A mid-term research agenda for a holistic approach to digital literary studies

Members: Amílcar Cardoso, Jonas Kuhn, Leonid Berov, Manuel Portela, Sina Zarriëß

Summary: This working group initiated their discussion by establishing a common terminology in digital literary studies, operating by comparison to the digital study of language. The established common ground for the ensuing discussion was that all fields involved interact with the ‘literary artefact’. Literary scholars depart from a text and come up with new conceptualizations, while computational storytelling algorithms depart from conceptualizations and generate stories. Based on this analysis, the group identified similarities and differences in these two approaches regarding the underlying conceptions, input, output and intermediary tasks. Using this outline the existing potential for collaboration between the fields by combining parts of these processes were discussed. This raised interesting challenges that result from the different traditions of the participating fields, and impede any straight forward exchange of already existing algorithms or data. These challenges need to be addressed first, before any integrative software systems can be developed to implement such combined approaches on a meaningful scale. The results of this work group can be seen as the foundation for a white paper that structures and outlines a mid-term research agenda for a holistic approach to digital literary studies that incorporates methodologies from computational creativity, respectively a theory-grounded approach to computational storytelling that incorporates conceptions from literary theory.

4.4 What is a Good Narrative?

Members: Evelyn Gius, Kai-Uwe Kuühnberger, Oliver Kutz, Carlos Leon, Rafael Pérez y Pérez

Summary: Our working group started its discussion by exploring commonalities in the fields of story generation, language processing and (digital) literary studies. For this purpose, we tried to look at three aspects: methods, topics/problems, and data. Even though talks from all fields concerned had been given in the seminar, it was not a straightforward task to identify aspects the different fields share when dealing with narratives. Especially the connection between generation and analysis of narratives seemed both the most helpful and the most difficult point to get at. The discussion then developed further towards the question of quality assurance in the work with narratives. There, evaluation was considered a core issue by all participants. Even though it concerns clearly different aspects (e.g., evaluating the quality of a generated story vs. evaluating the quality of the analysis of a narrative), evaluation was considered a critical issue in all fields because there seems to be a lack of well-established methods for evaluation so far. Here again, an interdisciplinary collaboration seems to be promising. We think of interdisciplinarity as the generation of new knowledge that could only emerge as a result of the (methodological, epistemological, practical...) interplay between two or more disciplines. After having discussed the challenges of interdisciplinary work and possible ways of fostering it, we decided to design a workshop that would explore this further. The workshop is envisaged as an event during the “Summer of Knowledge” hosted by the Research Centre for Knowledge and Data of the Free University

of Bozen-Bolzano in September 2020 in Bolzano, Italy ². Since the call is still in work in progress, we only provide the description of the central ideas here. The call will be published on the Summer of Knowledge website in summer 2019.

The core question of the workshop will be: “What is a Good Narrative?” The workshop is planned with participants coming from different research areas, in particular digital literary studies, narratology, computational literary creativity, computational modeling of narrative cognitive modeling. The participants will share a common interest in narratology, computational approaches, plot generation, analysis of narrative, and cognition. Here are some exemplary questions that tackle the quality of narratives from the perspective of generation and/or analysis:

- How can we identify good narratives?
- What makes stories similar
- How to identify (sub-)stories?
- Which methods can be used to model narratives?
- What is it that makes a narrative creative?
- What is the relation between generation and evaluation in a narrative production process?
- How can narratives be interpreted?
- What are narratives made of?

The workshop aims at bridging the gap between different approaches towards modeling narratives in different fields. Therefore, we would like to especially encourage submissions combining generative and analytical approaches. The modeling of narratives can, among others, include computational approaches, narratological approaches, hermeneutic approaches, visual narratives, cognitive approaches like conceptual blending, analogy making, metaphor, image schemas, and the like. We are looking for submissions as results of collaborations between two or more of the following fields: cognition, narratology, computer science, ontology, computational creativity, literary studies. Papers can range from theoretical contributions to mixed method approaches and computational modelling. And finally, we are thinking about having a rather unusual, but in our view very important restriction: Since papers should integrate insights from at least two fields, we are planning to accept only papers with authors from at least two fields and to request a section in each paper that elaborates on the establishment of the interdisciplinary collaboration.

4.5 A Roadmap for Driving Progress

Members: Mark Finlayson, Marina Grishakova, Hannu Toivonen, Tony Veale, João Miguel Cunha, Tarek R. Besold

Summary: Working group 5 formulated a medium-term plan for driving progress at the intersection of computation and narratology and literary studies. The plan was motivated by a 50-year vision—a “mission” in the terminology of Horizon Europe—which we nominally designated “Universal Understanding”: namely, the idea that discussion of narrative and literature forms an interdisciplinary space of discussion for large, inclusive topics (such as love, war, friendship, justice, etc.) that allows societies to move toward mutual understanding by disparate groups.

² <https://summerofknowledge.inf.unibz.it/>

This ultimate goal was deemed especially relevant today given the clear breakdowns in inter- and intra-societal understanding in first world countries (e.g., the rise of extremism and populism, growing inequality in wealth and political power). The group proposed two medium-term milestones along the path to the 50-year goal: a 5-year goal of explainable AI via narrative (XAI-N), and a 10-year goal of explainable “anything” via narrative (XAny-N). These two medium-term goals were conceived of as follows. Both of these medium-term goals were seen as tasks that would address two field-specific problems, namely that (1) computationalists and humanists still have great difficulty communicating with each other; (2) computationalists suffer from shallow use of narrative and literary theory; and (3) humanists are still resistant to scientific and computational approaches. XAI-N was conceived as the use of narrative to explain complicated AI systems (such as deep neural nets) through appeal to narrative and literary techniques (aligned with article 13 of the GDPR which calls for “meaningful insight” into automatic decisions). XAny-N was conceived as the analogous extension of this technique to any complex system (e.g., a historical situation or political structure). XAny-N was also conceived to be paired with the development of a “narratology of computation”, in which the techniques of narratology would be applied to computational processes and artifacts. One concrete outcome the group envisioned as coming from these medium-term goals was a revolutionary change in the character of both computational and humanist approaches to narrative and literature and the development of narrative meta-hermeneutics based on the use of narratives (grounded in shared intentional (dialogic) systems) as cognitive and exploratory tools and on the integration of computation in narrative practices and theorizing an innovative convergence of narrative tools and information technologies. On the way to XAI-N, the first medium-term goal, the group proposed several concrete steps. (1) Soliciting position papers from interested parties in the next year; (2) Holding of a “bidirectional” master class on computational and narratological techniques in the summer of 2020; (3) Organization of code camps and exploratory development in the year following the master class; (4) Writing of proposals aimed at XAI-N against the anticipated 2021 DFG Priority Programmes call (in Germany) on Computational Literary Science, and possibly H2020 or equivalent targets; and (6) Assembly, in parallel with steps 1-5, of an edited volume of foundational works in narrative aimed at computationalists.

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