Introduction
Digital Humanities in Practice

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Digital methods for humanities research: chances and challenges

Digital Humanities (DH) is a growing field within the Humanities dealing with the application of digital methods to humanities research on the one hand as well as addressing questions about the influence of digital practices on research practices within the different humanities disciplines on the other. Edward Vanhoutte differentiates between computing methods being used "*for* and *in* the humanities".[2] In his view the field of Digital Humanities, which was referred to as Humanities Computing before 2004, profited from the fact that the development of the first electronic computers were well underway during the Second World War, but were only fully operational after the war was over. This meant that their original military purpose, primarily in the field of ballistics and cryptanalysis, became obsolete, and the developers involved started looking for new operational scenarios in which the computers could be put to use. This failure, as Vanhoutte puts

1 I want to thank all contributors to this volume for their articles as well as their patience and dedication during our collaboration. The same goes for all members of team INF without whom this volume would not have been possible. This is especially true for Julia Becker, who proofread this volume and made it into what it is today. This book has been written within the framework of the Collaborative Research Center SFB 1288 "Practices of Comparing. Changing and Ordering the World", Bielefeld University, Germany, funded by the German Research Foundation (DFG).

2 *Vanhoutte, Edward*, The Gates of Hell: History and Definition of Digital | Humanities | Computing, in: Melissa M. Terras/Julianne Nyhan/Edward Vanhoutte (eds.), Defining Digital Humanities: A Reader, London: Routledge, 2016, 119–156, 120.

it, allowed the computers to be used in the field of the humanities, especially in machine translation, from the 1950s onwards.[3] Clearly, this marks the beginning of the use of computing *for* the humanities, rather than *in* the humanities. Although Vanhoutte argues that both aspects can never be fully separated from each other, most digital practices can usually be attributed more to the one than to the other. At first glance, automatic word-by-word translations seem to be the attempt to use the computer in a clearly framed environment where the researchers trusted that its abilities would do exactly what they expected. It was only when the automatic translations started to provide unexpected results that the researchers started to think about their perception and understanding of the – in this case English – language while looking for explanations for the mistakes the computer made. Vanhoutte refers to Roberto Busa who "identified the major problem with research in Machine Translation not as the inadequacy of computers to deal with human language, but as man's insufficient comprehension of human languages".[4] Busa himself is one of the earliest and most important pioneers in Humanities Computing, or Digital Humanities, since he started a cooperation with IBM in order to create a concordance of the works of St. Thomas Aquinas in the 1940s. His relatively early assessment demonstrates the impact that the use of computational, or digital, methods can have on our understanding of the humanities as a research field and on the objects of that research. Busa hints at the necessity to alter our conceptions of language rather than looking for computational miscalculations. It is this impact that substantiates the apprehension that the field of Digital Humanities (or Humanities Computing as it was called during his time) is not only an advanced methodology but a research field in its own right. The vastness of such a field that might encompass any digital practices in the humanities – from communication practices to data management and data mining – accounts for the lack of a formal definition of what Digital Humanities actually is. The website "What is Digital Humanities" alone offers 817 different definitions collected by the

3 *E. Vanhoutte*, The Gates of Hell, 120–123.

4 *E. Vanhoutte*, The Gates of Hell, 125. Vanhoutte refers to *Busa, Roberto,* The Annals of Humanities Computing: The Index Thomisticus, in: Computers and the Humanities 14 (1980), 83–90, 86.

project "Day of DH" from 2009 to 2014.[5] Helene Schlicht and Anna Maria Neubert offer more insight into the definitions, workings, and self-determinations of Digital Humanities in their respective contributions to this volume.[6]

The historical account of Edward Vanhoutte shows one thing for sure that is also present in most Digital Humanities definitions: DH is a genuinely interdisciplinary endeavor. It brings together two very distinct research areas, Computer Science and the humanities, as well as many diverse research disciplines, methods and questions. The productive interaction between computer scientists and humanities researchers is one of the biggest chances and at the same time the biggest challenge in DH. As shown in the example from the early days of automated text analysis, the use of computational methods can inspire new research in the humanities. Unfortunately, their implementation is also often seen as an unnecessary and time consuming undertaking that only reproduces results that could have been generated by 'traditional' methods as well.[7] This impression leads to the assumption that DH is merely about methodology and focuses too much on the digital side of things, highlighting the results rendered by the application of digital tools to (mostly) text material. The innovative potential of interdisciplinary research of this kind is easily overlooked and downplayed. While it is absolutely necessary that research projects in DH offer interesting perspectives for both Computer Science and the humanities, the tendency to overemphasize the value of the new and advanced computer technologies belittles the importance of the humanities. Regardless of the alleged progress that comes with digitalization or the supposedly higher objectivity inherent in empirical data, it is still necessary and will remain essential to interpret the results produced by computational methods to arrive at reliable propositions.

5 *Heppler, Jason*, What Is Digital Humanities, https://whatisdigitalhumanities.com/ [accessed: 21.08.2019].

6 See the contributions of Helene Schlicht and Anna Maria Neubert in this volume.

7 See for a similar discussion *Schwandt, Silke*, Digitale Objektivität in Der Geschichtswissenschaft? Oder: Kann Man Finden, Was Man Nicht Sucht?, in: Rechtsgeschichte – Legal History 24 (2016), 337–338. doi:10.12946/rg24/337-338.

1. Doing DH in Bielefeld: data infrastructure and Digital Humanities

In 2017, the German Research Foundation (DFG) granted funding to the Collaborative Research Center (SFB) "Practices of Comparing. Ordering and Changing the World".[8] The Research Center consists of fourteen individual subprojects led by researchers from many different humanities disciplines, such as History, Literary Studies, Art History, Political Science, and Law. Situated at the heart of the center is the infrastructural project INF "Data Infrastructure and Digital Humanities" which is "responsible for supervising all data- and information-related activities by providing a collaborative digital work and research environment for the whole SFB."[9] The project comprises expertise from the field of computer and information science as well as from the humanities, thus being well positioned to advise the other subprojects and to further the development of digital methods for the humanities. The main trajectories of the INF project include the implementation of a communication and project management tool for the Research Center as well as a data publication platform, where all historical source material is made available in digital formats. These aspects belong to the field of Research Data Management. Additionally, INF also supports the researchers in all questions regarding the use of digital methods for their subprojects. After developing a workflow for the digitization of documents with the help of OCR tools,[10] we advised six projects in total on how to tackle their research interests by using digital methods. They come from a variety of humanities disciplines and used different tools and analytical methods.

At the core of our work lies the task of modeling.[11] The practice of modeling may not be totally unknown to humanities scholars, although it has not yet been extensively discussed as such. Modeling seems to belong to the Sciences and has long been described as one of their core scholarly practices – especially in Physics. The need to implement the practice of modeling into

8 *Universität Bielefeld*, SFB 1288, Practices of Comparing. Ordering and Changing the World, https://www.uni-bielefeld.de/(en)/sfb1288/ [accessed: 21.08.2019].

9 *Universität Bielefeld*, SFB 1288, TP INF, Data Infrastructure and Digital Humanities, https://www.uni-bielefeld.de/(en)/sfb1288/projekte/inf.html [accessed: 21.08.2019].

10 This workflow is described in detail in the contribution to this volume by Patrick Jentsch and Stephan Porada.

11 Anna Maria Neubert describes our work in detail in her contribution to this volume.

the humanities comes from the wish to productively interact with computational methods. Digital tools need a model to work with, an explicit and consistent representation of the world. Humanities researchers may have such representations at hand for the time periods, societies, etc., which they regard as their research objects. But they seldom frame them as a model. Willard McCarty defines such models as "either *a representation of something for purposes of study*, or *a design for realizing something new*."[12] In our work at the Research Center we learned that modeling in order to build a representation for purposes of study is essentially a process of translation and transformation. It requires a great deal of communication and mutual understanding. Working in the humanities calls for adaptable interpretations that form, for example, our narrations of the past. Computer scientists, on the other hand, are trained to solve problems by finding one answer to any question. Therefore, the process of modeling does pose a challenge, especially to the humanities researcher. But it also opens up new ways of interacting with our knowledge about our research material and questions. McCarty points out two effects of computing to that end: "first, the computational demand for tractability, i. e. for complete explicitness and absolute consistency; second, the manipulability that a digital representation provides".[13] In my opinion, it is the second effect, the manipulability of digital representations that offers the most interesting possibilities for the humanities. After using one distinct, explicit, and consistent model to arrive at that representation, the interpreter can always go back and change his or her presuppositions. Often, the digital representation that offers ways of manipulation is realized through visualizations.[14] These can be graphs, diagrams, trees, or network visualizations. Martyn Jessop sees the strength of digital tools of visualization in "[…] the ability of these tools to allow visual perception to be used in the creation or discovery of new knowledge."[15] He stresses that in using visualization tools knowledge is not only "transferred, revealed, or perceived, but is created through a dynamic process."[16] He also claims that "[digital visualiza-

12 *McCarty, Willard*, Humanities Computing, Houndmills: Palgrave Macmillan, 2014, p. 24.

13 *W. McCarty*, Humanities Computing, 25.

14 *Jessop, Martyn*, Digital Visualization as a Scholarly Activity, in: Literary and Linguistic Computing 23 (2008), 281–293. doi:10.1093/llc/fqn016.

15 *M. Jessop*, Digital Visualization as a Scholarly Activity, 282.

16 *M. Jessop*, Digital Visualization as a Scholarly Activity, 282.

tion] allows manipulation of both the graphical representation and the data it is derived from."[17] Therefore, each visualization represents a certain interpretation of the source data, which depends on a manipulated version of that data. Bettina Heintz, a German sociologist working on the epistemological challenges posed by scientific visualizations, discusses the practice of such manipulations as one of the central practices in working with digital tools. The information behind the visualization is "altered, filtered, smoothed, and adjusted, until there is a relation between the expected and the presented".[18] This practice does not only happen at the beginning of the research process but also over and over again during the research process. Interacting with digital tools in this way is a "genuinely experimental process".[19] As McCarty says, "modelling problematizes".[20] Hence, through visualization, the process of modeling can be continuously reevaluated. Modeling, as well as visualizing, enables humanities researchers to explore their digitalized source material in new ways. "As a tool of research, then, modelling succeeds intellectually when it results in failure, either directly within the model itself or indirectly through ideas it shows to be inadequate."[21] What McCarty calls 'failure' could also be framed as 'productive irritation' – something that irritates the expectations of the researchers, which differs from their previous knowledge in such a way that it inspires new ideas about the allegedly well-known material.[22]

Six of the individual research projects in the Research Center at Bielefeld University have taken up this challenge and decided to evaluate digital methods for their humanities research. They joined the team of project INF in modeling their research ideas so that we could find digital tools that would help to answer those questions. In line with the overall research interests

17 *M. Jessop*, Digital Visualization as a Scholarly Activity, 238.

18 *Heintz, Bettina/Huber, Jörg*, Der verführerische Blick: Formen und Folgen wissenschaftlicher Visualisierungsstrategien, in: Bettina Heintz/Jörg Huber (eds.), Mit dem Auge denken: Strategien der Sichtbarmachung in wissenschaftlichen und virtuellen Welten (Theorie:Gestaltung 01), Zürich/Wien/New York: Voldemeer; Springer, 2001, 31.

19 *B. Heintz/J. Huber*, Der verführerische Blick, 23.

20 *W. McCarty*, Humanities Computing, 26.

21 *W. McCarty*, Humanities Computing, 26.

22 See *Schwandt, Silke*, Digitale Methoden Für Die Historische Semantik: Auf Den Spuren Von Begriffen in Digitalen Korpora, in: Geschichte und Gesellschaft 44 (2018), 107–134 for the idea of such productive irritation.

of the SFB 1288, these research questions all focus on practices of comparing while addressing such practices in different times, different genres or media, and performed by different historical actors. Practices of comparing seem to be ubiquitous – even today. What makes them historically interesting are the situational contexts in which they are being used, where they either stabilize certain ideas and structures or re-organize and change them. Comparing the modern West to the rest of the world, generating narratives of supremacy or eurocentrism, seems almost natural. The analysis of the emergence and the development of this specific comparison as well as the careful scrutiny of the situations in which this comparison is being made offer new insights into the development of nation states, of racism, and much more.[23] Digital tools of annotation and text analysis have proven to be especially useful in supporting research into practices of comparing since they allow, for example, simultaneous viewing of results as well as the detection of speech patterns representing specific modes of comparing. At the same time, DH methods are themselves often comparative and, therefore, implementing them makes it imperative to reflect on our own practices of comparing.[24]

2. Matching research practices and digital tools

The research projects, which serve as the basis for the contributions to this volume, all deal with textual material. It was therefore necessary to find tools for automatic textual analysis that would match the different underlying research questions. As text analysis tools we decided to work with *Voyant Tools* and *AntConc*. They both offer ample possibilities to calculate word frequencies, compile concordances, among other things, as well as provide visualizations of patterns within text documents or corpora.

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23 *Epple, Angelika/Erhart, Walter,* Die Welt beobachten – Praktiken des Vergleichens, in: Angelika Epple/Walter Erhart (eds.), Die Welt beobachten – Praktiken des Vergleichens, Frankfurt/New York: Campus, 2015, 7–31.

24 *Neubert, Anna/Schwandt, Silke,* Comparing in the Digital Age. The Transformation of Practices, in: Angelika Epple/Walter Erhart /Johannes Grave (eds.): Practices of Comparing. Towards a New Understanding of a Fundamental Human Practice. Bielefeld 2020 [in print].

Voyant Tools is a web platform containing several open access text analysis tools.[25] It was developed by Geoffrey Rockwell and Stéfan Sinclair and is freely accessible on the web. The tools available operate mainly on word frequencies as well as the calculations of word distances. They span from well-known applications such as word cloud visualizations *(Cirrus)* to more elaborate tools focusing on the calculation of word repetitions throughout a text *(Knots)*.[26] For the purposes of the projects in this volume the scope of tools provided by Rockwell and Sinclair is enough. In practice, it seems to be especially appealing to literary scholars and their interests in the use, frequency, and distribution of words and phrases throughout a text. Malte Lorenzen makes use of Voyant Tools in his article "Testing Hypotheses with Dirty OCR and Web-Based Tools in Periodical Studies".[27] One of the tools he uses is Cirrus, the world cloud tool. Although the developers claim that word clouds "are limited in their interactivity […] [and] do not allow exploration and experimentation",[28] Lorenzen uses a series of these clouds to achieve just that. Confronting the different clouds with each other renders them exploratory after all through the practice of comparing. At the center of this comparison lies data that can be viewed as a representation of text, or rather as information about text. Rockwell and Sinclair claim that, in general, "[v]isualizations are transformations of text that tend to *reduce* the amount of information presented, but in service of drawing attention to some significant aspect."[29] In the case of the word cloud the 'significant aspect' is the frequency of words in relation to each other represented by the relative size of their visualization. Hence, using digital text analysis tools often does not give us concrete or direct information about texts as a whole but about words, or character combinations, that need to be related to textual documents as superordinated, larger units before they can be interpreted. As Rockwell and Sinclair put it, "the magic of digital texts is that they are composed of discrete units of information – such as the character unit – that can be infinitely

25 *Rockwell, Geoffrey/Sinclair, Stéfan,* Voyant. See through your Text, https://voyant-tools.org/ [accessed: 27.08.2019].

26 *Rockwell, Geoffrey/Sinclair, Stéfan,* Tools, https://voyant-tools.org/docs/#!/guide/tools [accessed: 27.08.2019].

27 See the contribution of Malte Lorenzen in this volume.

28 *G. Rockwell/S. Sinclair,* Text Analysis and Visualization, 276.

29 *G. Rockwell/S. Sinclair,* Text Analysis and Visualization, 276. Highlights in the original.

reorganized and rearranged on algorithmic whims".[30] Whether it is magical or not, analyzing small, linguistic units of information instead of reading texts as indivisible entities offers new insights for researchers working on textual material as is being proven by the contributions in this volume. Joris C. Heyder and Christine Peters made use of a tool called AntConc for the same purpose.[31] Developed by Laurence Anthony,[32] AntConc "is a freeware, multiplatform tool for carrying out corpus linguistics research and data-driven learning".[33] Other than Voyant Tools, it is a stand-alone tool that can be downloaded and installed locally on a computer. The tool comprises a Concordance Tool, a Concordance Plot Tool, which offers a barcode visualization of a keyword in context results, a File View Tool, N-Grams and Collocates Tools as well as Word List and Keyword List Tools. This range of tools is especially useful for studies interested in the word use present in certain documents or corpora. It offers the possibility to look for words surrounding specific keywords that offer insight into the concepts represented by words.

The contributors to this volume used digital text analysis tools such as Voyant Tools and AntConc in order to explore new ways to analyze the material they were researching. Rockwell and Sinclair describe two principles that they deem important when engaging with automatic text analysis: "Don't expect too much from the tools [and] [t]ry things out".[34] The first is about perspective. "Most tools at our disposal have weak or nonexistent semantic capabilities; they count, compare, track, and represent words, but they do not produce meaning – we do."[35] While it seems obvious that the count of words does not carry semantic meaning, it is necessary to keep it in mind while looking for hooks for interpretation. This is also what makes working in DH a challenge. It is imperative to learn how to read visualizations and data as well as we read text. "Visualizations make use of a visual

30 *G. Rockwell/S. Sinclair*, Text Analysis and Visualization, 279.

31 See their contributions in this volume.

32 *Anthony, Laurence*, AntConc Homepage, https://www.laurenceanthony.net/software/antconc/ [accessed: 27.08.2019].

33 *Anthony, Laurence*, AntConc (Windows, Macintosh OS X, and Linux), https://www.laurenceanthony.net/software/antconc/releases/AntConc358/help.pdf [accessed: 27.08.2019], 1.

34 *G. Rockwell/S. Sinclair*, Text Analysis and Visualization, 288.

35 Ibid., 288.

grammar, just as language requires a linguistic grammar, and we need to be able to parse what we see before attempting to analyze and understand it […]."[36] This is exactly why DH is a genuinely interdisciplinary endeavor making use of two things: digitization, or technologization, and hermeneutic interpretation. New digital technology transforms how we perceive and store information. It changes the ways of (social) interaction and communication. It allows access to vast amounts of information that need new ways of organization. And although these new technologies seem to be constantly evolving and becoming more and more important, it is equally important to make sense of these changes, to gain a new perspective, and to stay in touch with these developments in order to maintain a grip on them. In short: "[A]s digital technologies become increasingly pervasive, the work and skills of Digital Humanists become increasingly important."[37]

3. Digital research perspectives in the humanities

While it seems to be almost impossible to separate computing *for* the humanities from computing *in* the humanities, the contributions in this volume focus on the implementation of digital methods in different humanities disciplines. By discussing the chances and challenges posed by this methodological endeavor, the contributors also touch on questions of the impact that working with digital tools has on the research practices of their respective fields. Their contributions are accompanied by three articles written by members of the project team INF trying to frame the setting of our collaborative work at Bielefeld University.

Helene Schlicht and Anna Maria Neubert deal with two important aspects of the general setup of our collaborative work within the Research Center in their respective articles. Helene Schlicht focuses on questions of "Open Source, Open Data, and Open Software". She analyzes the "role of Open Science in the research landscape of the humanities in general and DH in particular".[38] At present, questions of open access play a prominent role in

36 Ibid., 287.

37 *M. Terras*, Peering inside the Big Tent, 270.

38 See Schlicht, "Open Access, Open Data, Open Software? Proprietary Tools and Their Restrictions" in this volume.

political discussions about and within the humanities. In DH the implementation of open science solutions is much farther along. Schlicht argues that the contention of the two fields might help the advancement of both them. One of the problems she points out is the possible conflict between disciplines in DH. Anna Maria Neubert also discusses chances and challenges of interdisciplinary work in her contribution explicitly focusing on "Navigating Disciplinary Differences [...] Through Project Management".[39] While it is not specific to DH projects, project management certainly helps with their organization and execution. It is especially important to take into account the possibly different research interests of the disciplinary groups participating in the projects as well as the different pace in research and publication. Neubert also discusses most of the software tools we used for the organizational side of our collaboration.

In their contribution on "From Text to Data. Digitization, Text Analysis, and Corpus Linguistics",[40] Patrick Jentsch and Stephan Porada describe the technical workflows that we implemented for the collaboration. The main piece of the article deals with the digitization pipeline that was used to render the historic source material machine readable. Including this article into the volume demonstrates how important it is to include computer scientists into DH teams and also to take their research interests seriously. Only then does the collaboration rise to its full potential. It is also elementary to a volume focusing on digital methods to be transparent about every part of those methods and give credit where credit is due.

The contributions in this volume come from the fields of Computer Science, History, Literary Studies, and Art History. They represent the different approaches to research, different views and takes on text and interpretation.

One of the biggest challenges for the implementation of digital methods is the availability of digital source material – especially for historically oriented projects. Malte Lorenzen's contribution deals with the chances offered and challenges posed by dirty OCR as a means to test the efficiency of digital methods for periodical studies from a Literary Studies' point of

39 See Neubert, "Navigating Disciplinary Differences in (Digital) Research Projects Through Project Management" in this volume.

40 See Jentsch and Porada, "From Text to Data. Digitization, Text Analysis, and Corpus Linguistics" in this volume.

view. In his own words, his article has "experimental character"[41] and shows how exploring digital tools can further humanities research. He argues for a combination of close and distant reading that is necessary to integrate both quantitative digital methods and hermeneutic methods in the humanities, which is a position that can be found in many of the articles. Similar in the general trajectory of his interest in the chances and challenges posed by methods of Optical Character Recognition (OCR) and its use for historically oriented research is Joris C. Heyder's article on "Challenging the *Copia*".[42] He, also, wants to analyze great amounts of data, which is why a well-functioning OCR is crucial. While Malte Lorenzen uses the digital toolkit Voyant Tools to look for single terms and their usage in his material, Joris C. Heyder uses AntConc and its Concordance Tool to sort through the available material in search for the most interesting texts, building a corpus for his analysis from there.[43] Both articles use what we would call big data, but with different research questions and assumptions. Both explore the data with the help of digital tools arriving at different conclusions since they address the data on different levels – Lorenzen looks at the lexical level, whereas Heyder concentrates on the document level. Comparing the two articles demonstrates the manifold applications of digital methods in the humanities. What they have in common is the interest in "quick and dirty" digitization as a means to sort through large amounts of data.[44] They go about this task by testing the hypotheses they already have in mind after using traditional hermeneutic methods in designing their projects. Christine Peters follows a similar approach in her article on Alexander von Humboldt and his travel writings.[45] Alexander von Humboldt is probably one of the most well-known historical figures in world literature, and beyond. Christine Peters takes on the task of trying to find new perspectives on his travel writings in her contribution.

41 See Lorenzen, "Testing Hypotheses with Dirty OCR and Web-Based Tools in Periodical Studies" in this volume.

42 See Heyder, "Challenging the *Copia*. Ways to a Successful Big Data Analysis of Eighteenth-Century Magazines and Treatises on Art Connoisseurship" in this volume.

43 See the discussion of these tools above.

44 See Heyder, "Challenging the *Copia*. Ways to a Successful Big Data Analysis of Eighteenth-Century Magazines and Treatises on Art Connoisseurship" in this volume.

45 See Peters, "Text Mining, Travel Writing, and the Semantics of the Global. An AntConc Analysis of Alexander von Humboldt's *Reise in die Aequinoktal-Gegenden des Neuen Kontinents*" in this volume.

She combines methods of distant and close reading and develops new techniques for keyword in context searches that render visible what has not yet been seen in Humboldt's travelogue. In doing so the contribution stresses the necessary combination of both digital and humanities methods in text mining. Peters also addresses the question of our own practices of comparing as humanities researchers and sees new opportunities for these in working with digital methods. She applies this combination of methods not only to test them against her own hypotheses but finds new insights into Humboldt's travel writings along the way.

Anna Dönecke focuses more directly on the question of data modeling in historical research.[46] In her contribution she assumes that data modeling as a basic operation in Digital Humanities can alter the perspective of historians on their sources. Creating a relational database with information from eighteenth-century court records requires a different understanding of their contents, shifting the focus from content information to features and patterns. Her examples show that implementing methods from computer science such as data modeling produces a genuine surplus for historical research. This is especially true when implementing methods of pattern recognition, Dönecke argues, because this explicitly changes the perspective of the researcher towards his or her source material. Using data models and relational databases forces us to dissect the documents we are interested in into tiny bits of information and to attribute meaning to the common features that can be detected by looking at this information rather than by reading the documents as text. It is this way of interacting with textual sources that poses the biggest challenge to our daily work of interpretation as humanities researchers. The contribution by Marcus Hartner, Ralf Schneider, and Anne Lappert demonstrates this nicely.[47] Representing the field of British Literary Studies, the authors went about their project with a clear question in mind. They are interested in the way that the emerging middle class in eighteenth-century Britain represented itself through their morality in contemporary novels. Using Voyant Tools, Hartner et al. look for textual evidence of their hypotheses, but find only little. Their discussion of

46 See Dönecke, "From Serial Sources to Modeled Data. Changing Perspectives on Eighteenth-Century Court Records from French Pondicherry" in this volume.

47 See Hartner et al., "Looking for Textual Evidence: Digital Humanities, Middling-Class Morality, and the Eighteenth-Century English Novel" in this volume.

this alleged failure is very enlightening for the relationship of digital and traditional methods. Since their research interest rested with a concept instead of a certain term or phrase in the beginning, the authors test several search strategies to find textual evidence matching their presuppositions. They engage with what has been called "screwmeneutics" diving into the digital tools as a means of explorative hermeneutics.[48]

Digitally enhanced text analysis does not only get more difficult the more complex the task of interpretation is but also the more complex the linguistic structures are that one is looking for. In order to teach sentence structure and the meaning of temporal comparisons to the computer, the tasks of annotating, parsing, and tagging must be applied. The contribution by Willibald Steinmetz, Kirill Postoutenko, Olga Sabelfeld, and Michael Götzelmann discusses the results achieved through tagging in different corpora processed with different taggers, and poses the question whether or not the task of preprocessing is worthwhile when reading and interpreting would do the job at least as fast as the tested taggers did.[49] What takes time is building the models that serve as a basis for (semantic) tagging. And while it is necessary and reasonable to think about the ratio of effort and gain in every project design, the contributions in this volume show that engaging with the digital is worthwhile for the humanities.

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48 The term was coined by *Ramsay, Stephen*, The Hermeneutics of Screwing Around; or What You Do with a Million Books, in: Kevin Kee (ed.), Pastplay: Teaching and Learning History with Technology, Ann Arbor: University of Michigan Press, 2014 [2010].

49 See Steinmetz et al., "The Historical Semantics of Temporal Comparisons Through the Lens of Digital Humanities: Promises and Pitfalls" in this volume.

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