

# The Digital Cluster Project “Digitising Patterns of Power (DPP)”: Uniting History, Archaeology, Geography and Cartography with Tools from Digital Humanities

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## 1. Introduction

The project “Digitising Patterns of Power: Peripheral Mountains in the Medieval World”,<sup>1</sup> which is abbreviated *DPP* in the following, is funded within the programme “Digital Humanities: Langzeitprojekte zum kulturellen Erbe” of the Austrian Academy of Sciences in Vienna for the duration of four years (from 1 January 2015 until 31 December 2018). It is hosted at the Institute for Medieval Research (IMAFO)<sup>2</sup> of the Austrian Academy of Sciences and unites as a digital cluster project<sup>3</sup> various scholars from the fields of Medieval History, Byzantine Studies, Historical Geography, Archaeology, Geography, Cartography, Geographical Information Science (GISc) and Software Engineering.

In order to achieve the aims of the project the Team *Institute for Medieval Research* (Austrian Academy of Sciences) is cooperating with an external project partner, namely the Team *Department of Geography and Regional Research* of the University of Vienna (Professor Dr Karel Kriz).<sup>4</sup>

In the year 2015 four case studies on the Middle Ages have begun to furnish insights in the development and sustainment of power in a spatial context.<sup>5</sup> These four case studies were “The Carolingian Eastern Alps (8<sup>th</sup>–9<sup>th</sup> cent.)” [in the project’s course entitled “The Agilolfingian and Carolingian Eastern Alps (8<sup>th</sup>–9<sup>th</sup> cent.)”] (Katharina Winckler), “The March/Morava – Thaya/Dyje Border-region (7<sup>th</sup>–11<sup>th</sup> cent.)” (Stefan Eichert), “The Historical Region of Macedonia

<sup>1</sup> URL: <<https://dpp.oeaw.ac.at/>>, 01.11.2018.

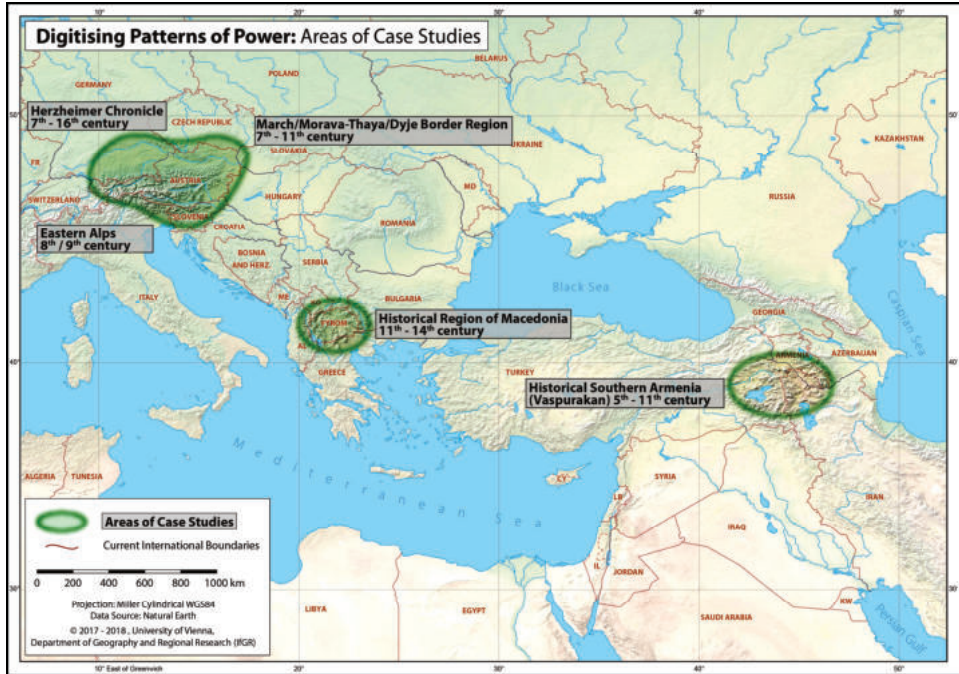
<sup>2</sup> URL: <<https://www.oeaw.ac.at/imafo/>>, 01.11.2018.

<sup>3</sup> URL: <<https://www.oeaw.ac.at/imafo/forschung/clusterprojekte-langzeitprojekte/>>, 01.11.2018.

<sup>4</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=Team>>, 01.11.2018.

<sup>5</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies>>, 01.11.2018.

(12<sup>th</sup>–14<sup>th</sup> cent.) – The Transformation of a Medieval Landscape” (Mihailo St. Popović) and “Historical Southern Armenia: the ‘Rise and Fall’ of Vaspurakan (5<sup>th</sup>–11<sup>th</sup> cent.)” (Johannes Preisler-Kapeller).



*DPP* focuses on the depiction and analysis of space and place in medieval written sources, the interaction between built and natural environment, the appropriation of space and the emergence of new political, religious and economic structures of power. Hereby, a special focus is put on mountainous areas and the interaction of human development of power and natural environment. Historical and archaeological data are digitised, combined and geo-referenced with the help of tools deriving from Digital Humanities (using the *OpenAtlas* Database-system).<sup>6</sup>

<sup>6</sup> An overview of the project’s aims and content in: Stefan Eichert/Bernhard Koschicek/Mihailo St. Popović, Digitising Patterns of Power (DPP): A Digital Approach towards Recording, Managing, Analysing and Presenting Archeological and Historical Information based on Case Studies from Eurasian Mountainous Regions, in: *Acta Archaeologica Carpathica* 51 (2016) 253–283. The pdf of this publication can be accessed online via: <[http://www.academia.edu/34375479/together\\_with\\_St.\\_Eichert\\_and\\_B.\\_Koschicek\\_Digitising\\_Patterns\\_of\\_Power\\_DPP\\_A\\_Digital\\_Approach\\_towards](http://www.academia.edu/34375479/together_with_St._Eichert_and_B._Koschicek_Digitising_Patterns_of_Power_DPP_A_Digital_Approach_towards)

## 2. The Case Studies and Research Highlights

Already in 2015 case study no. 2 entitled “The March/Morava – Thaya/Dyje Borderregion (7<sup>th</sup>–11<sup>th</sup> cent.)” was extended by another case study concerning the March-Thaya border region and its development from the Early to the High Middle Ages. It was carried out by Stefan Eichert in an international cooperation with the University of Vienna (Institute of Prehistory and Historical Archaeology) and the Masaryk University Brno (Czech Republic) under the name “Frontier, Contact Zone or No Man’s Land?”. This cooperation has focused especially on the “digital” part, and both projects (i. e. *DPP* and “Frontier, Contact Zone or No Man’s Land?”) have benefited from the synergies. An additional cooperation with the University of Nitra in the Slovak Republic has also been established by Stefan Eichert in 2015. As a result, sites from the Slovak part of the border region were included and made available for further analysis within *DPP* as well.<sup>7</sup>

In 2016 a fifth case study entitled “The Herzheimer Family Chronicle (613–1506)” (Veronika Polloczek) was added to the aforesaid four case studies.<sup>8</sup> Furthermore, the project *DPP* and the Ss. Cyril and Methodius University of Skopje (Faculty of Philosophy, Institute for History) had started a cooperation in 2016 within the framework of a joint scholarly project entitled “The Ethnonym of the Vlachs in the Written Sources and the Toponymy in the Historical Region of Macedonia (11<sup>th</sup>–16<sup>th</sup> cent.)” (Project No. MK 03/2016).<sup>9</sup> This project, which was successfully submitted by Professor Dr Toni Filiposki and me, was funded by the Centre for International Cooperation & Mobility (ICM) of the Austrian Agency for International Cooperation in Education and Research (OeAD-GmbH) for two years (from 1 July 2016 until 30 June 2018) and formed a sub-project

[\\_Recording\\_Managing\\_Analysing\\_and\\_Presenting\\_Archeological\\_and\\_Historical\\_Information\\_based\\_on\\_Case\\_Studies\\_from\\_Eurasian\\_Mountainous\\_Regions\\_Acta\\_Archaeologica\\_Carpathica\\_51\\_2016\\_257-283](#), 01.11.2018. Also published in German: Stefan Eichert/Bernhard Koschicek/Mihailo St. Popović, Digitising Patterns of Power (DPP): Fallstudien zur digitalen Aufnahme, Verwaltung, Analyse und Präsentation archäologischer und historischer Daten, MEMO – Medieval and Early Modern Material Culture Online: MEMO # 2 [doi: 10.25536/20180203; <<http://memo.imareal.sbg.ac.at/wsarticle/memo/2018-eichert-dpp/>>], 01.11.2018.

<sup>7</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies&submenu=march>> and URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies&submenu=hic>>, 01.11.2018.

<sup>8</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies&submenu=herzheimer>>, 01.11.2018.

<sup>9</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies&submenu=skopje>>, 01.11.2018.

within *DPP* in collaboration with case study no. 3 entitled “The Historical Region of Macedonia (12<sup>th</sup>–14<sup>th</sup> cent.) – The Transformation of a Medieval Landscape”.<sup>10</sup>

*DPP* and the Institute for History of the Ss. Cyril and Methodius University of Skopje had decided to explore the medieval Byzantine and Slavonic sources (especially charters and historiography) related to the Vlachs in the historical region of Macedonia from the 11<sup>th</sup> until the 16<sup>th</sup> centuries and to focus on the interplay between the resident population and these nomads. Moreover, historical and archaeological research was combined with Digital Humanities. The Austrian side built upon the manifold data provided by the volume *Tabula Imperii Byzantini (TIB) 16* written by me for the Austrian Academy of Sciences with the aim to create a historical atlas of the historical region of Macedonia.<sup>11</sup> In addition to identifying and evaluating Byzantine and Slavonic sources and collecting additional secondary literature, journeys to the respective country of the cooperation partner took place with the aim to bring together the project partners, to strengthen their ties, to enable a thorough discussion of the relevant medieval sources on the Vlachs for reaching a common level of interpretation and for preparing to include the elaborated data into the *DPP OpenAtlas Database*. The input of the respective data was undertaken by two young colleagues and students of mine, Jelena Nikić, BA and David Schmid, BA, and the project was successfully completed in June 2018.

In 2017 one of the most important aspects of *DPP*'s research work were the so-called “Signs of Power”. These are intended to serve as a designation for places, in which rulers, or persons empowered by them, exercised and/or represented symbolic, but also concrete power. Therefore, members of the *DPP* project team, namely Katharina Winckler, Veronika Polloczek, David Schmid, Bernhard Koschicek and me, defined the respective term “Sign of Power”, which was given preference over the term “Symbol of Power”. The English word “Symbol” was seen as a concept, which mainly encompasses intangibles, and, therefore, was deemed too narrow for addressing the analysis of the description of space in written sources, the interactions between natural and cultural space and the

<sup>10</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies&submenu=makedonien>>, 01.11.2018.

<sup>11</sup> URL: <<https://tib.oeaw.ac.at/index.php?seite=status&submenu=tib16>>, 01.11.2018.

rise of power. A type tree for the “Sign of Power” was developed by the aforesaid scholars and has been implemented in the *DPP OpenAtlas Database*. The “Signs of Power” are only tagged within the entity “Place” and are divided into four large groups, i.e. political, economic, cultic and military, which are again subdivided.<sup>12</sup>

In 2017 a new scholarly cooperation via the integration of a sixth case study within *DPP* entitled “The Byzantine Region of Bithynia (4<sup>th</sup>–15<sup>th</sup> cent.)” was accomplished by Dr Olivier Delouis (Senior Research Fellow at the CNRS Paris) and me.<sup>13</sup> Two French research programs have focused on the Byzantine region of Bithynia (Turkey), which extends from the Southern shore of the Marmara Sea to Mount Olympus (Uludağ), and from the lake of Apollonias to the Sangarios river. The online publication of the French surveys of Bithynia was made possible by the cooperation of the Laboratory of excellence (Labex) RESMED (Religions and Societies in the Mediterranean World, Sorbonne University, Paris), Sorbonne University, the National Centre for Scientific Research (CNRS, UMR 8167 Orient et Méditerranée, Paris) and the Austrian Academy of Sciences (Vienna). The French project and case study is directed by Olivier Delouis, while Julien Curie, a trained geographer, is a postdoctoral fellow working for the project.

In the spring of 2017 I had the opportunity to accomplish two further scholarly cooperations, firstly with the Hilandar Research Library (HRL) of the Ohio State University<sup>14</sup> and secondly, together with Stefan Eichert and the software developer Alexander Watzinger, with the project Pelagios.<sup>15</sup>

<sup>12</sup> An outline on the “Signs of Power” is provided in the following publications: Mihailo Popović/Veronika Polloczek, *Digitising Patterns of Power (DPP): Applying Digital Tools in the Analysis of Political and Social Transformations in the Historical Region of Macedonia, 12<sup>th</sup>–14<sup>th</sup> Centuries*, in: *Medieval Worlds: Comparative & Interdisciplinary Studies* 5 (2017) 170–194. The pdf of this publication can be accessed online via: <[http://www.medievalworlds.net/medieval\\_worlds?frames=yes](http://www.medievalworlds.net/medieval_worlds?frames=yes)>, 01.11.2018; Mihailo St. Popović/Vratislav Zervan, *Signs and Maps of Power in Medieval Europe: A Case Study on Byzantine Macedonia (13<sup>th</sup>/14<sup>th</sup> Centuries)*, in: *MEMO – Medieval and Early Modern Material Culture Online: MEMO # 2 – Digital Humanities & Materielle Kultur* [doi: 10.25536/20180206; see URL: <<http://memo.imareal.sbg.ac.at/wsarticle/memo/2018-popovic-signs-and-maps-of-power/>>, 01.11.2018].

<sup>13</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=CaseStudies&submenu=bithynia>>, 01.11.2018.

<sup>14</sup> URL: <<https://library.osu.edu/hrl>>, 01.11.2018.

<sup>15</sup> URL: <<http://commons.pelagios.org/>>, 01.11.2018.

Thus, the aim to digitise/to scan selected manuscripts (i.e. Carolingian and Serbian charters), as outlined in the project proposal of *DPP*, has been implemented. This very approach was and is fulfilled by the two case studies “The Agilolfingian and Carolingian Eastern Alps (8<sup>th</sup>–9<sup>th</sup> cent.)” and “The Historical Region of Macedonia (12<sup>th</sup>–14<sup>th</sup> cent.) – The Transformation of a Medieval Landscape”.

In the case of the historical region of Macedonia the scans of the first charter to be evaluated were provided by the aforesaid Hilandar Research Library (HRL). This example is the Slavonic charter given to the Monastery of Saint George-Gorg near Skopje by the Serbian King Stefan Uroš II Milutin in the year 1300 (HRL, SPEC.HM.SDS.132 and 133). Its scan was annotated by me based on the software *Recogito*,<sup>16</sup> which was developed by Pelagios. For the time being, the places mentioned in the charter are linked to the Gazetteer of Pelagios<sup>17</sup> and will be transferred to a *DPP Recogito*. Altogether 32 places were linked to the respective toponyms in the scans of the charter.

This first case study of annotation was presented, amongst others, by Dr Rainer Simon (Austrian Institute of Technology, Vienna<sup>18</sup>), one of the software developers of *Recogito*, at the International Medieval Congress in Leeds 2017. A scan of a Byzantine and a Serbian charter for the church of Sveti Nikita near Banjane was annotated by me as a second confined case study. Thus, determined steps were taken in order to create a “best practice” in this area of research and to contribute to endeavours, which are an important aspect of the *DPP* research agenda.

Finally, a scholarly synergy between *DPP* and the FWF Austrian Science Fund Project P 30384-G28 “Byzantino-Serbian Border Zones in Transition: Migration and Elite Change in pre-Ottoman Macedonia (1282–1355)” has been achieved in the summer of 2017.<sup>19</sup> This FWF project is conducted by me, is hosted at the Division of Byzantine Research of the Institute for Medieval Research of the Austrian Academy of Sciences and is at the same time a sub-project of the

<sup>16</sup> URL: <<https://recogito.pelagios.org/>>, 01.11.2018.

<sup>17</sup> URL: <<http://recogito.pelagios.org/OEAWProjectDPP>>, 01.11.2018.

<sup>18</sup> URL: <<https://www.ait.ac.at/#/>>, 01.11.2018.

<sup>19</sup> URL: <<https://tib.oeaw.ac.at/index.php?seite=sub#borderzone>>, 01.11.2018.

Long-Term Project *Tabula Imperii Byzantini (TIB)*<sup>20</sup> of the Austrian Academy of Sciences (Institute for Medieval Research, Division of Byzantine Research). Two scholars, namely Vratislav Zervan, MA PhD, and Bernhard Koschicek, BSc BA, are engaged in this project since autumn 2017, which will last for four years (from 1 October 2017 until 30 September 2021).

### 3. Software and Database Engineering

In 2015 Stefan Eichert and the software developer Alexander Watzinger finished the first version of the *DPP OpenAtlas Software*, which enables a Database System for Object Oriented Modelling of the Past. A database backend was designed in PostgreSQL and PostGIS, using CIDOC-CRM for the data model. Additionally, a web interface for inserting and editing data was created using standard technologies such as HTML5, PHP and JavaScript. In order to enable users to work with spatial data, a map interface was implemented using the Leaflet library and OpenStreetMap data.

Very often only vague information is given in written sources regarding the spatial position of the mentioned entities. For example, a village which is attested in a charter might be identified either with a still existing village, the exact extent or shape of which we know, or it might be identified with an abandoned village, which can be attributed to a certain area, in which it was originally located. In order to be able to deal with this fuzziness of spatial information, a framework was developed by Stefan Eichert and Alexander Watzinger based on Leaflet and PostGIS. This feature enables the user to draw polygons with the aim to mark the spatial extent of a historical entity or simply to create a centre point of its position. The respective feature is implemented in the map interface of the web application. Therefore, it is possible to record any type of precise or vague localisation without loss of information in our *DPP OpenAtlas Database*.<sup>21</sup>

In 2016, Bernhard Koschicek developed a project website based on a web-design by the designer Jan Belik, who also created the *DPP* logo. In the third year of *DPP* (2017) the work on *OpenAtlas* focused on the migration of the application to Python3 within the Flask framework. The port with additional fea-

<sup>20</sup> URL: <<https://tib.oeaw.ac.at/>>, 01.11.2018.

<sup>21</sup> Eichert/Koschicek/Popović, Digitising Patterns of Power 273–278.

tures was finished and is available since spring 2018. It includes the possibility to upload various files like images, texts, videos etc. and to display them directly in the application. The user-interface has also been extended to record archaeological data on sites, features, stratigraphical units and finds. Furthermore, this port results in considerable performance improvements.

The Team Department of Geography and Regional Research of the University of Vienna developed the first prototype of the map based online application, which is called *DPP Mapviewer*, in 2016. It is the prominent frontend of *DPP*, a key aspect of the project and serves two equally important functions: one function is to enable the scholars of *DPP* to view their spatial data and to explore spatial relations between different database entities and, thus, gain insight into the medieval landscape. The second function of the application is to present the research of *DPP* and its results to an interested public audience in the world-wide-web.

In the final version of the application key results of *DPP* are also communicated via “story maps”, predefined views of data, which are complemented with a detailed description of the topic shown and information about its significance for historiography.

The prototype of the *DPP Mapviewer* offered basic functionalities, queries as well as dot representations of the already embedded data. It was a testbed for various representations of uncertain geometries in order to determine, which one is best suited for the final application.

It was successfully tested in early 2017 by our project team. Building on this prototype, development continued and polygon representation of uncertain locations and permalinks were added. At the end of 2017 software development focused on an easy to use query builder. This query builder allows the user to explore the data stored within the *DPP OpenAtlas Database* and to see the results on the map. Moreover, the Team Department of Geography and Regional Research of the University of Vienna has designed a customised *DPP map* and a *DPP map modern*. The difference lies in the fact that the second one shows features of modern infrastructure like urban areas, dam lakes etc., while the first has been adjusted by clearing these data sets in order to present and visualise the embedded medieval data of our project in the best possible way. In addition,



the analogue maps of the Long-Term Project *Tabula Imperii Byzantini (TIB)* at a scale 1:800,000 have been georeferenced and embedded as an additional layer into the *DPP Mapviewer*.

#### 4. Outreach and Dissemination

In the first year of *DPP* (2015) Bernhard Koschicek and me have established a digital *DPP Newsletter*, which is distributed quarterly via e-mail. The goal of this newsletter, which is programmed by Bernhard Koschicek, is to inform in a succinct way on the content, the state and the progress of *DPP*. The reactions to the newsletters have been very positive and lead to new contacts with the international scholarly community as well as constructive queries and discussion. The newsletters, which have been distributed so far, can be accessed via our *DPP* homepage.<sup>22</sup>

The Long-Term Project *Tabula Imperii Byzantini (TIB)* will succeed the *DPP Newsletter* and launch its successor, a newsletter called the *HistGeo-Newsletter*, with its first issue due in March 2019. This *HistGeo-Newsletter* will include news and reports from the fields of Mapping, Digital Mapping, Historical Atlases and of Historical Geography of the Byzantine Commonwealth. Contributors will be – apart from the scholars of the *TIB* – especially members of the *Commission for the Historical Geography and Spatial Analysis of Byzantium* at the Association Internationale des Études Byzantines (AIEB).<sup>23</sup>

Users, who have registered for the *DPP Newsletter*, will continue to receive the new *HistGeo-Newsletter* in 2019. The *DPP* homepage can be consulted to subscribe or to unsubscribe to the *DPP Newsletter* and its successor, which is in accordance with the Privacy Policy of the Austrian Academy of Sciences.<sup>24</sup>

Accompanying to the project *DPP*, I have initiated a scholarly collaboration with the publishing house *Akademiska Knjiga* in Novi Sad (Serbia)<sup>25</sup> and have founded a new peer-reviewed publication series as chief editor together with Professor Dr Andreas Külzer (*TIB*) entitled “Studies in Historical Geography

<sup>22</sup> URL: <<https://dpp.oeaw.ac.at/index.php?seite=Newsletter>>, 01.11.2018.

<sup>23</sup> URL: <<https://tib.oeaw.ac.at/index.php?seite=aieb>>, 01.11.2018.

<sup>24</sup> Cf. on the Privacy Policy of the Austrian Academy of Sciences, URL: <<https://www.oeaw.ac.at/en/the-oeaw/data-protection/>>, 01.11.2018.

<sup>25</sup> URL: <<http://akademskaknjiga.com/>>, 01.11.2018.

and Cultural Heritage".<sup>26</sup> This series aims at exploring new methods and theories in the Historical Geography of Byzantium and adjacent areas as well as at discussing new thoughts and ideas within the scholarly disciplines of Historical Geography and Digital Humanities (GIS; HGIS), Archaeology, Environmental Studies, Paleobotany, and Paleozoology of the Mediterranean World, and their influence on existing methodologies. The first volume of this series is the edited volume ("Festschrift") for Professor Dr Johannes Koder entitled "Space, Landscapes and Settlements in Byzantium. Studies in Historical Geography of the Eastern Mediterranean", which was published in 2017 and promoted on 2 March 2018 at the Austrian Academy of Sciences. It is the result of a fruitful scholarly cooperation between *DPP* and the Long-Term Project *Tabula Imperii Byzantini* (*TIB*) of the Austrian Academy of Sciences. New volumes are in preparation and will be published in the near future.

In order to communicate scholarly results of *DPP* and related projects to national and international scholars, students as well as the interested public, I have initiated the *DPP Lecture Series* in Vienna in January 2017, which takes place quarterly each year.<sup>27</sup> The aim of the series is to invite speakers, the papers of which have the potential to foster discussions on new methods and digital tools in the academic fields of Medieval History, Byzantine Studies, Historical Geography, Archaeology, Geography, Cartography, Geographical Information Science (GISc) and Software Engineering. Since January 2017 we have had six lectures. With the completion of the project *DPP* the Long-Term Project *Tabula Imperii Byzantini* (*TIB*) will continue to organise these lectures under the name *HistGeo-Lectures* starting with March 2019.

In May 2015 I organised and led a workshop on medieval Slavonic charters entitled "Digitising Patterns of Power (DPP): Altslawische Urkunden des Mittelalters – eine bekannte schriftliche Quellengruppe neu betrachtet" at the Austrian Academy of Sciences in Vienna, which was attended by students of History, Byzantine Studies, Slavonic Studies and Balkan Studies of the University of Vienna. The aim of the workshop was to introduce the students to the vast field of research on medieval Slavonic charters, which form one of the main groups of

<sup>26</sup> URL: <<https://histgeo.oeaw.ac.at/>>, 01.11.2018.

<sup>27</sup> URL: <<https://lectures.histgeo.oeaw.ac.at/>>, 01.11.2018.

sources within *DPP*. These future young scholars, among them Bernhard Korschick and David Schmid, were trained in diplomatics, the historical background of the sources, their translation and interpretation.

The First International Workshop of *DPP* entitled "Digitising Patterns of Power (DPP): Theory and Practice in Historical Geography and Digital Humanities" took place on 28–29 September 2016 at the Institute for Medieval Research of the Austrian Academy of Sciences in Vienna.<sup>28</sup> In total 25 national and international researchers, representing manifold academic disciplines, discussed relevant aspects, expectations and possibilities of digital methods in History, Archaeology and Geography, especially databases, digital editions and mapping.

In the first session of the Workshop the *DPP* team introduced its scholarly work and respective case studies to the participants. The second session was dedicated to the concept of the aforesaid "Signs of Power" in *DPP*, while the third session focused on digital mapping and edition. The envisaged goal of the Workshop has been achieved, which was to establish a theoretical basis for the common research question of *DPP*, namely the definition of the "Signs of Power" for all case studies and their representation as Dynamic Types within the framework of the *DPP OpenAtlas Database*.

The project's highlight of 2018 was the concluding conference<sup>29</sup> and the publication of an edited volume entitled "Power in Landscape: Geographic and Digital Approaches on Historical Research" at the Eudora publishing house in Leipzig.<sup>30</sup>

According to the system *AkademIS* for the documentation of publications and papers of the Austrian Academy of Sciences the project *DPP* has accomplished 65 publications and 81 papers from January 2015 until October 2018.

## 5. Visiting Scholars and Promotion of Young Scholars

During our project we had the pleasure to welcome several visiting scholars, namely Marija Vasiljević, MA, a PhD student in the field of Medieval Studies at

<sup>28</sup> URL: <<https://www.oeaw.ac.at/de/imafo/veranstaltungen/event-details/article/digitising-patterns-of-power-dpp/>>, 01.11.2018.

<sup>29</sup> URL: <<https://www.oeaw.ac.at/en/imafo/events/event-details/article/power-in-landscape-geographic-and-digital-approaches-on-historical-research/>>, 01.11.2018.

<sup>30</sup> URL: <<https://eudora-verlag.de/de/startseite/>>, 01.11.2018.

the University of Belgrade, for a two-month scholarship of the Scholarship Foundation of the Republic of Austria from 1 April 2016 until 31 May 2016, Dr Yuri Marano from Italy, an expert in Late Antique and Early Medieval Archaeology, Christianisation and Late Antique as well as Early Medieval Urbanism, in September 2017, Professor Dr Toni Filiposki and Professor Dr Boban Petrovski (both University of Skopje) from 28 May until 12 June 2017, Doz. Dr Nikola Minov and Mag. Boban Gjorgjievski (both University of Skopje) from 4 March until 8 March/12 March 2018, and again Professor Dr Toni Filiposki and Professor Dr Boban Petrovski from 6 May until 13 May 2018, and, finally, Dr Srdjan Pirivatrić from the Institute for Byzantine Studies of the Serbian Academy of Sciences and Arts as a Visiting Scholar of *DPP* from 25 January to 26 February 2018.

Accompanying to the project *DPP*, research was conducted by a student assistant of the project, David Schmid, which resulted in a BA thesis entitled “Transhumanz im historischen Makedonien des 14. Jahrhunderts. Symbiose und Konflikte zwischen Vlachen und Slawen” under the supervision of Professor Dr Marija Wakounig at the Institute for Eastern European History (University of Vienna).

## 6. Outlook

*DPP* is a cutting edge project within Digital Humanities and uses as well as develops digital tools for data-acquisition, data-management, processing as well as for analyses, visualisation, communication and publication. By following such an approach, *DPP* envisages at gaining new insights and innovative research-results, which could not be achieved based solely on traditional methods. These research results are presented by our team members and fellow scholars amongst others in the present volume. The *DPP Frontend* (i.e. the *DPP Mapviewer*) will be online and available for use in the world-wide-web at the beginning of June 2019 under a License CC-BY.

As Principal Investigator of *DPP* I am very much indebted to the Austrian Academy of Sciences and especially to the Director of the Institute for Medieval Research, Professor Dr Walter Pohl, for his incessant support as well as to Mrs

Michaela Popp, the Institute’s administrator, for her tireless help in all administrative matters.

The aforesaid Long-Term Project *Tabula Imperii Byzantini (TIB)* of the Austrian Academy of Sciences will continue to foster and to develop tools from Digital Humanities (also those of *DPP*) in the field of Historical Geography via its sub-projects at the Austrian Academy of Sciences. The *TIB* is the nationally and internationally leading project on Historical Geography, Mapping and Geocommunication of the Byzantine World.

Therefore, the *Tabula Imperii Byzantini (TIB)* has started to create, develop and upkeep the online atlas “Maps of Power: Historical Atlas of Places, Borderzones and Migration Dynamics in Byzantium”,<sup>31</sup> which will also be freely accessible online in the first half of 2019. “Maps of Power: Historical Atlas of Places, Borderzones and Migration Dynamics in Byzantium” is based on the profound analogue data, which is researched and published by the project leaders of the *TIB*, namely Prof. Dr Andreas Külzer and Doz. Dr Mihailo Popović, and their junior scholars in printed *TIB*-volumes with maps at the scale 1:800,000.<sup>32</sup>

Parts from the large pool of the rich analogue data of the *TIB* are extracted in order to address new scholarly questions and methods. Therefore, analogue data sets of the *TIB* are embedded into the backend of “Maps of Power: Historical Atlas of Places, Borderzones and Migration Dynamics in Byzantium”, which is an *OpenAtlas* Database.<sup>33</sup>

The aforesaid new scholarly questions and methods include the academic fields of Byzantine and Medieval Studies, Global and Migration Studies, Historical Geography and Cartography, GIS and Geocommunication and their respective visualisation tools. These ground-breaking research questions are addressed both by the excellently evaluated *TIB* itself as well as by its innovative sub-projects.<sup>34</sup>

The frontend of “Maps of Power: Historical Atlas of Places, Borderzones and Migration Dynamics in Byzantium” is the *TIB MapViewer*, which is visualising

<sup>31</sup> URL: <<https://oeaw.academia.edu/MapsofPower>>, 01.11.2018.

<sup>32</sup> URL: <<https://tib.oeaw.ac.at/index.php?seite=team>>, 01.11.2018.

<sup>33</sup> URL: <<http://www.openatlas.eu/website/>>, 01.11.2018.

<sup>34</sup> URL: <<https://tib.oeaw.ac.at/index.php?seite=sub#borderzone>> and <<https://tib.oeaw.ac.at/index.php?seite=sub#digtib>>, 01.11.2018.

our data and results and which will be freely accessible online starting with summer 2019. The academia as well as the interested public are warmly encouraged to query the respective *TIB* data and to engage in our discourse on the Mapping of Byzantium. If this occurs, then the digital aims both of *DPP* and the *TIB* will be completely achieved and fulfilled.