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Lectures' Abstracts

Fabrizio B<small>IGOTTI</small>

AI for Project Writing

From brainstorming to revising and improving drafts, Artificial Intelligence (AI) has introduced new ways of thinking and researching in academia that can no longer be ignored. At the same time, however, the popular idea that AI could replace intellectual work, and that one could train ChatGPT and other such programs to write an entire project from scratch, has proved to be a myth. In addition to ethical concerns, Large Language Models (LLM) have their own strengths and limitations, including lack of depth and bias. This presentation will provide a concise guide to embedding AI in research writing through practical applications in revising, summarising, brainstorming, classifying and visualising data. Examples will include the creation of Gantt charts to manage the working hours of a research team, as well as demonstrating the inherent limitations and biases of each of these applications..

Arsen B<small>OBOKHYAN</small>

The Phenomenon of Dragon Stones of Armenian Mountains and their Digital Reconstructions

In the high mountains of Armenia, unique monuments have been preserved to our days, which are traditionally called by the people "vishapakar" (dragon-stone). Although vishapakars have been discovered more than a century ago, their secrets are far from being deciphered. Much like the khachkars (cross-stones) of Medieval times, vishapakars are typical for the prehistoric landscapes of the Armenian Highland. The centres of their distribution are Mount Aragats and the Geghama mountains. Today we know ca. 150 examples of these monuments. Vishapakars are 150-550 cm high and made, as a rule, of grayish basalt. According to their shape and iconography, they can be divided into three types: 1. vellus (tetrahedral stones, carved as if the hide of a bovid had been draped or spread on them), 2. piscis (in the shape of a fish), 3. hybrida (combines the traits of the former two). As a rule, vishapakars lie in situ, either collapsed or placed in a horizontal position on the ground. Their "habitat" spreads over a landscape as high as 3000 m above the sea level. For the main part, vishapakars were

standing stones, although a few could also be lying. Most vishapakars appear in groups, a few are in isolated positions. A joint Armenian-German-Italian expedition investigating vishapakars discovered that they are mainly located in water-rich, flat meadows, and within cromlechs (or ritual platforms). They are surrounded also by other structures, such as tombs, rock carvings, or tower-like constructions. Vishapakars have been widely used during the Bronze Age and especially within the 2nd millennium BC, although their beginning can go back to the Neolithic period, ca. end of the 6th millennium. The aim of this presentation is to demonstrate the phenomenon of dragon stones based on digital reconstructions of corresponding stelae and their landscapes.

Francesco CICALA   **Deep Learning: Understanding the Core Concepts**

This presentation provides an introduction to the fundamental mechanics of deep learning, covering key technical concepts that drive its transformative impact. Beginning with neural networks and their architecture, the talk explores feedforward networks, convolutional neural networks (CNNs), and recurrent neural networks (RNNs). The discussion extends to unsupervised learning and transfer learning. Optimization algorithms such as stochastic gradient descent are elucidated. This talk aims to equip participants with a foundational understanding of deep learning algorithms, inspiring further exploration in the field.

♦ ♦ ♦   **Practical AI: Concepts in Action**

Expanding upon the theoretical foundations laid in the previous session, this lecture focuses on the practical applications of fundamental AI ideas. It highlights the transformative capabilities of generative models and their role in tasks like image and language generation. Attendees will gain insights into how AI's creative aspects impact various fields. This lecture allows participants to not only grasp the theoretical foundations but also observe these concepts in real-world scenarios. Whether you're interested in practical AI applications or simply wish to deepen your understanding, this talk offers an accessible overview that sparks curiosity and encourages further exploration.

Norbert FISCHER   **"Camerarius Digital" – Deep Learning for the Mass Transcription of Historical Printings**

This talk will present a system for the automatic mass transcription of historical printings, which are applied in the Camerarius Digital project for the transcription of the works of Joachim Camerarius the Elder (1500-1574). The system uses a combination of deep-learning techniques for automatic layout recognition and optical character recognition

(OCR) techniques. The layout recognition component utilizes fully convolutional neural networks for baseline detection combined with a rule-based post-processing system to identify the different types of text elements on a page, such as headings, body text, and footnotes. The OCR component of the system uses a custom CRNN model optimized for Latin or Greek text with in-line language detection. To improve recognition, an incremental training and fine-tuning strategy is used which is directly accessible to the user using an intuitive web interface. Furthermore, the web interfaces for correcting the detected page layout and transcriptions are presented, which include an automatic OCR error detection based on a dictionary spell checker.

Alexander HUBERT   **"Camerarius Digital" – Reading Joachim Camerarius (1500 1574) in the Context of 16th-Century Discourse Landscapes**

Over the course of three years (2017-2019), the project "Opera Camerarii" has produced the first complete overview of the works and correspondence of the influential German humanist Joachim Camerarius (1500-1574) printed up to the year 1700. His writings have been catalogued in the form of a Semantic MediaWiki (http://wiki.camerarius.de) and their contents have been described and indexed with semantic keywords. The current project "Camerarius Digital" goes one step further by using this database to, firstly, further explore and describe Camerarius' correspondence, and, secondly, create an online lexicon situating Camerarius' oeuvre in the discourse landscapes of his time (CamLex). CamLex thus aims to create an interactive encyclopaedia that, on one hand, describes the historical and epistemic contexts in which Camerarius' works were written as well as their impact on contemporary knowledge, and, on the other hand, allows the user to switch between the larger picture and a more work-centred view taking advantage of semantic links between "Opera Camerarii" and the lexicon.

Ulrich SCHLEGELMILCH   **«Get It Wrong» (Part 1): How Unsuccessful Projects Can Teach us How to Refine our DH Skills**

A planned 3-year project on the humanist Joachim Camerarius envisaged bringing together digitised manuscript sources in a repository, processing them with HTR and editing the material in a Semantic Media Wiki. A preliminary study on HTR was strongly recommended and successfully completed. The required long-term preservation was guaranteed by a letter of intent. The application was rejected. I will use this experience to provide some indications on the specific risks that applicants for DH projects must currently expect and which questions remain unresolved, particularly in the area of long-term preservation.

Sabine SCHLEGELMILCH	**«Get It Wrong» (Part 2): How Unsuccessful Projects Can Teach us How to Refine our DH Skills**

This lecture describes the draft of a long-term project whose elaboration (phase 2 of the application process) was rejected by the Bavarian Academy of Sciences (Bayerische Akademie der Wissenschaften). The project combines reuse and expansion of existing data, automated compilation of a text corpus, use of OCR and HTR and publication of the results in a WIKI. The project was rejected due to not sufficiently detailed information on quantification and a "structural contradiction" with the Academy's funding line.

Viktorya VASILYAN	**Cultural Heritage: Metamorphoses and Metaverse in Virtual Museums**

The rapid growth of cultural tourism and technological advancements have spurred the evolution of virtual archaeology, a field using computer-based visualisation to explore, preserve, and present archaeological heritage. Introduced by Paul Reilly in 1990, virtual archaeology employs 3D models of ancient structures and objects, encapsulating the concept of virtual reality in dynamic-interactive visualizations. This interdisciplinary domain has become a significant scientific branch within cultural heritage, archaeology, and art over the last twenty years. It focuses on digitally representing historical assets using 3D technologies and interactive tools for analysis, interpretation, and dissemination. Crucial to this field's progression was the Europe 2002 Action Plan, initiated by EU Member States in 2000 to boost European digital content. This led to collaborative digitization efforts, highlighted at the Lund meeting in 2001, emphasizing the need to digitize cultural heritage for preservation and accessibility. Key documents like "The London Charter for the Use of 3D Visualisation in the Research and Communication of Cultural Heritage" (2006) and the "Seville Charter" (2011) by the Spanish Society of Virtual Archaeology (SEAV) have established foundational principles in this area. The "Virtual Archaeology Review (VAR)" magazine further contributes to the field's scholarly discourse. This talk will explore Virtual Archaeology's future prospects, its educational impact using 3D technologies, and its role in a comprehensive digital archiving of artefacts and historical sites. Emphasizing multimedia integration, it aims to enhance learning and conservation through interactive and immersive techniques.

♦ ♦ ♦	**Applications of Virtual Reality to Archaeology: from Prehistoric Learning to the Universe**

Over the past twenty years, the integration of digital technologies in cultural heritage studies has led to the emergence of "virtual archaeology" as a new interdisciplinary discipline, now a key scientific direction in the European academic sphere. This

project aims to introduce virtual archaeology in Armenia, employing advanced methods and tools for studying, preserving, and promoting historical and cultural heritage, particularly for tourism. The project, initiated by the late Professor Grigory Areshyan and managed by Viktorya Vasilyan, began in September 2021 with the support of the Manukian Simon Foundation. It focuses on documenting 100 Armenian archaeological sites using drone and 3D orthophotos to create a detailed online database. This database includes scientific descriptions, aerial videos, animations, virtual reconstructions, maps, and photographs of the sites. The project's completion in February 2023 resulted in a multilingual online resource, featuring unique promotional content, educational booklets, and travel websites. Key achievements include high-quality aerial images of significant Armenian historical sites, ranging from forts to temples, accompanied by historically accurate descriptions and topographical data. The use of advanced drone technology and video processing software enabled the creation of detailed 3D models of prominent buildings. This comprehensive online resource serves various educational and academic purposes, fostering public-private partnerships, conferences, and new tourism products.

Speakers' Biographical Outlines

Fabrizio Bigotti is DFG Fellow at the Institut für Geschichte der Medizin, Julius-Maximilians-Universität Würzburg, Honorary Fellow at the University of Exeter (UK) and Founding Director of the Centre for the Study of Medicine and the Body in the Renaissance (CSMBR). He is co-editor of the series Palgrave Studies in Medieval and Early Modern Medicine (PSMEMM, Springer Nature) and has published extensively on all apsects of the history of science, medicine and technology (1300-1700), with a focus on the emergence of quantification and the invention of precision instruments. He is currently Principal Investigator (Eigene Stelle) on the project "Measuring the World by Degrees. Intensity in Early Modern Medicine and Natural Philosophy (1400-1650)" funded in 2022 by the German Research Foundation (DFG - Project no: 461231785).

Arsen Bobokhyan, PhD in Archaeology, is a Director and Leading Researcher at the Institute of Archaeology and Ethnography, NAS RA. He specializes in the Bronze and Iron Age archaeology of the Armenian Highlands and the Near East, focusing in particular on ancient cults and cultural contacts. Bobokhyan currently leads excavations on Mt. Aragats and the eastern shores of Lake Sevan in Armenia. He is a co-founder and a vice-editor of the journal Aramazd.

Francesco Cicala is a machine learning engineer at Google Switzerland, in Zurich, where he develops Bayesian models to spot anomalies and prevent abuse in Google products. Before this, he was part of the Data Analytics team at PwC, developing machine learning solutions for big companies in manufacturing, defense, sports, and finance. He has a background in physics and deep learning. Outside of work, Francesco is learning Mandarin, enjoys board games, and to compete in arm wrestling.

Norbert Fischer studied Computer Science at the University of Würzburg. He completed his M.Sc. in 2020 with the thesis "Contour-based segmentation of historical printings". Since then, his research continues to be focused on layout detection and text recognition. Currently,

he works at the Chair of Artificial Intelligence and Knowledge Systems at the University of Würzburg. There, his main efforts focus on the "Camerarius Digital" project, for which he develops a fully automatic system for recognition of historical printings. Additionally, Norbert's commitment extends to education as he annually supervises parts of the AI1 lecture and seminar topics for bachelor and master students. While his main work focuses on the layout recognition, he is also engaged in several side projects, in which he develops AI-based solutions for a variety of different tasks, such as the development of an application for the digitization of cash register receipts.

Alexander Hubert has studied Latin and Greek philology and mathematics at the Julius-Maximilians-Universität Würzburg, Germany, where he is also currently pursuing his PhD. His academic research mainly focuses on German humanist networks in the early modern period. For his dissertation, he is editing and analysing the correspondence between the Leipzig professor Joachim Camerarius (1500-1574) and the Königsberg physician Matthias Stoius (1526-1583). Additionally, he is working as a research assistant on the project "Camerarius digital" (2021-2024), which aims to analyse the complete works of Joachim Camerarius. Prior to this, he supported the previous project "Opera Camerarii" (2017-2019) throughout its duration as a student assistant. He is also a member of the editorial board of the "Würzburger Jahrbücher für die Altertumswissenschaft" since 2023. .

Manuel Huth has studied Classical Philology and History in Würzburg. In the years 2014-2016 and 2021-2022 he worked on the digital project "Early Modern Physicians' Correspondence (1500-1700)" and in the years 2017-2019 on "Opera Camerarii". In 2021 he finished his PhD thesis in Classical Philology on the topic "Humanismus und Philosophie. Die medizinischen Schriften des Humanisten Joachim Camerarius (1500-1574)". Since April 2022 he is working on the DFG project "Medicinae Alumni Vitebergenses". This project collects information on the students and graduates of the Wittenberg Medical Faculty and their printed works in a prosopographical database. The goal is to analyze and visualize the development and dissemination of a specifically Wittenberg medicine in a self-designed database. In general, he makes extensive use of digital methods in all of these projects. As a lecturer at the University of Würzburg he has taught courses on translation from German into Latin, Biblical Greek, Semantic Mediawiki, and preparatory courses for the Latin Certificate.

Florian Langhanki serves as a Lecturer at the Chair for German Philology of the Middle Ages and Early Modern Era and a Research Associate at the Center for Philology and Digitality. His academic background is rich, encompassing studies in 'Middle Ages and Early Modern Era' for his Master's degree and Latin Philology, Greek Philology, German Philology, and Geography

for his Bachelor's degree. He has a profound interest in medieval studies and digital humanities, reflected in his extensive research and publications. He has co-authored influential papers like "OCR4all - Open-Source OCR and HTR Across the Centuries" and "Flexible working with OCR4all - mass full-text digitization of prints using OCR-D and high-quality transcription of manuscripts." His research focuses on innovative text recognition and digitization techniques. In addition to his academic and research roles, Langhanki is an active participant in various workshops and a member of the Association of Medievalists. His career trajectory at the University of Würzburg includes roles as a Research Assistant and Tutor in the same fields, highlighting his dedication to the study and teaching of medieval and early modern German philology.

Sabine Schlegelmilch is Assistant professor at the Institute for the History of Medicine and Head of the Medical Historical Collections, University of Würzburg. Academic training: Classics, German Literature (Würzburg/London, UCL). In 2008 she obtained an Interdisciplinary PhD in classics, archeology, Egyptology and her habilitation in the history of medicine in 2018. Schlegelmilch's research interests expanded into the history of medicine, leading to her involvement in the Munich Academy project "Early Modern Doctors' Letters" and the DFG project on Johannes Magirus. Her research interests include Early modern medical theory and practice; history of surgery and midwifery; visual history of medicine (film and photography) as well as material culture of medicine.
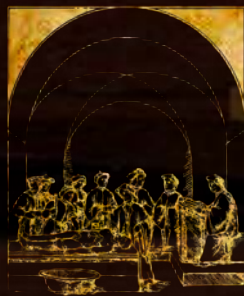
Ulrich Schlegelmilch following his studies in Würzburg and Pavia, he obtained his doctorate in Latin Philology at the University of Würzburg in 2001. His doctoral thesis was a focused study on Descriptio templi in Latin poetry of the confessional age. In his academic career at the University of Würzburg, he held various roles, including research assistant at the Chair of Classical Philology II. Since 2009, he has been integral to the Bavarian Academy of Sciences' project on Early Modern Doctors' Letters, contributing significantly to the field of historical medical correspondence. From 2017 to 2020, he managed the "Exchange of Letters" sub-project in the DFG-funded Opera Camerarius project. He currently oversees the "Camerarius digital" project since 2021, collaborating with other notable academics. His publications explore Neo-Latin literature and contribute to the understanding of early modern historical and cultural contexts. Ulrich's academic work, particularly in Latin philology and the history of early modern Europe, continues to influence these areas of study..

Viktorya Vasilyan is an archaeologist and art historian affiliated with the Institute of Archaeology and Ethnography at the National Academy of Sciences of Armenia. She earned her PhD in 2018, focusing on Women's Iconography during the Ancient and Classical Periods in

the Armenian Highlands. Vasilyan's career since 2012 includes roles at Yerevan State University, the American University of Armenia, and the Traditional Medicine University of Armenia. She currently manages the "100 Archaeological Monuments of Armenia" project (https://ama100.am/en) and serves as the Goodwill Ambassador for Peace, Human Rights, and Humanity under the IHRO-Republic of Armenia. Additionally, Vasilyan leads the Scientific Organizational Department at the Institute and teaches at the American University of Armenia.

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