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Editor's preface

Examples and progress in geodata science

Geodata science (or geographical data science) has raised its interest and importance during the past years. This is due the more diverse sources of the geographical information and data. Nowadays we can get massive amounts of data for example from the social media. In addition, computation power, technology, data storages, and even cloud-computing have improved a lot. All these improvements and changes have influenced the thinking how different sectors in the society and academia put efforts to gather data, analyse it and deliver outputs and results to various stakeholders. It is not an old c cliché that we are living in the era of information breakout.

In this breakout, there are also room for spatial thinking. I see that geographers have a lot to provide for the different actors using and demanding huge amount of digital data (~ big data). In quite many cases the data includes some sort of spatial element. Not always directly coordinates, but the data may consist of information that can be linked to locations by some sort of georeferencing. We can make georeferencing with the help of addresses, hashtags, other place names, image analyses, joining, database relations and so on. Our thinking of the geographical data (or geodata) has been broadened a lot. And in the future, we must think out-of-the-box more than before. We can't even imagine right now what kind of digital geographical data sources we might have in the future. But we know already that data amounts are large (~ big data) and data consists of both "traditional" research data as well as voluntary data or data for example from the social media. With social media data researcher are studying user groups' behaviour, values, or movement, but the data is bot originally designed for the research purposes. So, the definition of the big data is discordant – some are defining big data as a huge amount of any data, but some are defining it as a data that is not originally purposed purely for research purposes (such as social media data, data from video games, data from mobile apps such to mention few). One can consider that for example voluntary data of bird or plant species observations belongs also under the definition for big data. Therefore, I repeat again that in the future the variety of geographical data sources will become more diverse.

There is a growing scientific and societal need for digital geographical data sciences. Therefore, our duty in the university is to educate future's workers, scientists, and specialists to work with more diverse digital geographical data and larger data amounts. This publication is an output of university level course in geography "*GEOG-G303 GIS Project Work*". In this course, group of students worked together with our department's researchers and teachers to do practical, topical, and real projects assignments. Researchers worked as mentors and clients during the project course. In this way all project works were directly linked to actual research work and research projects. This built a strong link between the teaching and the research, which are the main two focus and goals in the university. In addition, in this way students got and idea and a direct contact surface what are the current advances and outcomes in the geographical data sciences.

This publication consists of seven chapter covering all those project assignments. Common for all the chapters and project assignments is that they all deal with digital

geodata. The Chapter I how to use Twitter statistics when tracking patterns of tourism. Incidentally, the Chapter VII uses also social media data. The chapter VII show a demonstration how to utilize Flickr social media data when studying wildlife conservation and conservation related tourism. There occur also other types of movement than tourism. Chapter VI shows demonstrations how geographical data science can be used when studying actual movement of people inside the metropolitan. And what kind of challenges one might face while processing geographical digital data. In addition, Chapter III shows a workflow and a case study how to combine various data type and data sources when analysing reachability (~ accessibility) and travel time pattern of a common service network – in this case official sports facilities. In geographical data sciences it is typical that one combines several databases and different data types together. And those processes should be automized and documented properly. In this course, geography students got valuable knowledge how to plan, execute, and document projects related on geographical data sciences.

Chapters II, IV, and V show how diverse the current field of geographical data sciences really is. The Chapter II review and discuss how geographical data sciences can help with current pandemic started globally in spring 2020. The pandemic hit the Finland exactly at the middle of this course. This challenged our students and teachers because the campus and the university were locked with only a short notice. Luckily, we managed to finalize this course with flexibility. Flexibility was needed also with the Chapter IV, in which we wanted to do some data converting for our VR utilities. The pandemic lock-down forced us to skip all actual data converting and work-flow documentation, which was our preliminary goal. Now the Chapter IV is a literature review about 3D data and virtual reality (VR). VR has broken through in the field of geographical data sciences and GIS. In our department we have two brand new VR utilities (VR cabins).

All the chapters in this publication demonstrate the wide variety of need for geographical data sciences. The Chapter V shows that geographical data science skills and methodology is needed also in the biogeographical research. So, geographical data sciences and its methods and approaches are needed in the both ends of the spectrum: in the “hard and cold” quantitative physical geography as well as in “soft” qualitative data. The common thing for all this variety in geographical research is that digital data is almost every time present, data amounts are growing, data types and sources have more and more variation, and a good documentation is needed.

This publication continues the series of course publications from the course “GEOG-G303 GIS Project Work”:

Kujala, S. & Muukkonen, P. (Eds.) (2019). *GIS applications in teaching and research*. Department of Geosciences and Geography C17. https://helda.helsinki.fi/handle/10138/309007

Tyystjärvi, V. & Muukkonen, P. (Eds.) (2018). *Creating, managing, and analysing geospatial data and databases in geographical themes*. Department of Geosciences and Geography C14. https://helda.helsinki.fi/handle/10138/254913

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