Interview summaries MSc thesis

This document provides summaries of the four interviews conducted for the GIMA MSc thesis "A Living Lab Approach to Geo-data Visualization in Higher Education in the Netherlands" by Mór Grommers.

1 Initial interviews

The first interview is with a manager in the geo-company Cyclomedia. The second interview is with an employee of the consultancy forest and nature conservation company Borgman Beheer, doing a part-time masters in geo-information science simultaneously.

1.1 Manager data analytics Cyclomedia

Mark Jan Grevink is manager data analytics Europe at a company called Cyclomedia. This company has clients like municipalities, institutions, and other companies for whom they record street images and analyze them, so that their clients do not need to go outside. Every year the company drives around the whole of the Netherlands, Europe, and in the USA to record streets with 360-degree cameras and lidar images. In their applications, they provide these images and can combine the street images with aerial photos. Parameters and measurements are added to the data on request of the clients. Api's are constructed for ArcGIS and other applications. Mark Jan's function is leading a team that takes care of all additional and supporting features on top of the lidar and photo images. Examples are locating, registering, and measuring, all light posts, above ground electricity poles or manholes and providing integrated maps for their clients. They visualize their results in maps and overlays in web view applications, that can be integrated with the client's own programs and applications, delivering WFS, WMS, shape files, SLD and Esri files. Mark Jan's team is not working with designing and creating geo-data visualizations specifically. This is something the end customer can do with the data Cyclomedia delivers. He does, however, explain what functions are enrolled in his team and what is required for those functions, in addition to general requirements. In his team, Mark Jan has three functions: quality assurance specialist, delivery specialist, and delivery manager. The quality assurance specialists are mostly not GIS related, but more analyzers of the data. They control the quality of the data and design applications. The delivery specialists are mostly GIS, geo informatics or other geography students. Setting up projects in applications, working with architectures and programming is part of this job. Scripting is part of this job, like Python, and working with applications like FME, QGIS and ArcGIS. The delivery manager is the project manager. This function talks with clients about the scope and planning projects, makes appointments, knows the applications, and has affinity with the discipline. New colleagues that are geo-graduates are mainly delivery specialists.

About the general requirements, Mark Jan states that basic knowledge about geo applications and the capability to get used to applications is very important. Skills like programming are also important, however such skills can also be refined when working with their company. He adds that solution-oriented skills and communication skills are also very important for jobs in his company in general. Technical skills can be learned on the job, but those social skills are important to be present. He states that pro-active skills like the drive to learn and sharing opinions are required for good work in projects. When asked what is missing in studies, he states that that differs per job and per person. About requirements for geo-data visualization jobs, he does not have much knowledge.

Important to note from this interview is that not only technical skills are important for jobs in the geo-information field. Much attention is being put on the presence of social skills, pro-activeness and group communication skills. Also, solution-oriented people are wanted a lot. In his company and companies

like it, technical skills can often be learned and refined, whereas social skills are required to start and get a feel for the job.

1.2 GIS-specialist at consultancy Borgman Beheer

Nico Spliethof is a GIS-specialist at consultancy Borgman Beheer with 15 employees, helping small and large landowners with nature and forest themes and questions they have. This can be counting trees, but also GIS analytics and lidar scanning. He and two colleagues take care of all the GIS work in the company, like remote sensing, analytics and providing end products. When asked how much of his work is data visualization, he mentions the time he needs for data visualizations is 20%, which is lowered by automation scripts and layouts. The visualization types he uses in his company are almost always 2D, tables and graphs. Working with cartography, dashboards, story maps and sometimes 3D are also part of his function.

When hiring new colleagues for geo-data visualization, the skills and requirements needed are not a high-level GIS, but familiarity with programs like ArcGIS is needed. The work is made easier as they make and use templates, helping with the startup of a job. They also made webapps which makes the job easily accessible. The software and tools they use are mostly ArcGIS desktop and online, but also excel and cloud compare for 3D. Python and R are used for analytics. Nico states a lot of time not much data visualization knowledge is needed beforehand. He adds that this is not how it is supposed to be, according to what he learns at his studies. The goals of his company are to make the clients happy, sometimes resulting in maps that are skewed and do not necessarily represent the full truth. Other non-technical requirements for jobs at his company are communication and working together. Also working alone is important as many colleagues work at home as well. Another thing that is important is affinity with the discipline forest and nature conservation. Skills and knowledge missing from recent graduates is affinity with the software they use. Being capable with software in general and adaptability is a very useful skill, as recent history and trends show that technological improvements come along fast, and changes are imminent.

When going through the importance of the ACRL visual literacy standards, he explains their importance and ranks their importance of a scale from 1 to 10, according to what they use and expect in his company. The first standard is most important with a 9 on the scale. He explains that the clients do not know what they want exactly, so they need to acquire their own concepts and ideas. The second standard is not that important with a 5 on the scale. As it is a niche market, they need to create a lot themselves and other images or sources are not usable. Standard three is also important with an 8 on the scale. The explanation and context of their visualizations are very important, as well as background knowledge and multidisciplinary knowledge. Standard four is a 6 on the scale. It is important, however the status of the data is not always the same, evaluating images and their sources happens a lot working together with colleagues, so individual knowledge is not specifically necessary. Standard five also is a 6 on the scale. This is also being done together. For a GIS specialist there needs to be knowledge about the meaningfulness of your creations. Standard six is a 7 or 8 on the scale, also being done in collaboration with the team. Concept versions are made, however they are discussed by the group and altered, so it does not have to be perfect. Nico states standards 7 is actually very important and should be an 8 or 9 on the scale, however in reality it is a 4 or 5. The responsibility for issues is being put at someone else's desk a lot. He gives an example of the sensibility of fire prevention maps for pyromaniacs.

When asked which of these standards a study should focus on, he mentions standard 1 and 3. In his experience, this is not being done enough. Standard 4 and 5 are treated a lot. Also 7 and 2 come by in the studies. Standard 6 is a free choice but is important in the industry. In general, he states that there

is a very theoretical approach and needs a more practical approach. He says it is important to note that in the industry there are other expectations than in theory learned in studies. More case studies and practical experience is needed. In this sense he mentions making a simple map is quite theoretical.

2 Additional interviews

The first additional interview is with Mandy Bron, a junior GIS specialist at Tensing, a GIS consultancy. The second additional interview is with Julie Llort, an employee of Orbital Eye, a company that provides geo-monitoring and inspection services.

2.1 Junior GIS specialist at Tensing

Mandy Bron is 25 years old and has been working at Tensing for 1.5 years now. Before this job she studied GIMA. In Tensing Mandy began as Young Professional, a traineeship of sorts, and now works as junior GIS specialist. She works one day for Tensing, and four days for their client municipality Haarlemmermeer. Tensing is a GIS consultancy with over 100 employees of which 75% are consultants who work with one or more clients in their internal systems with the goal of helping them solve GIS related problems and issues and help with daily tasks. Tensing gives training, delivers specialists primarily for FME and ESRI and manages services. All employees work with a wide range of visualization types like maps and dashboards.

Tensing expects people to have knowledge of data visualization as a GIS specialist. If you are not able to show what you do with the data, GIS specialist is not the right function for you, especially as you work with spatial data. In general, they require a higher level of independence for higher functions, especially in FME and ESRI applications. As a junior they expect new employees to have basic skills in visualization like translating raw data for the client. It's always fine not to know something, but being able to find the solution and solve your problem is something they look for in employees. From the young professionals at Tensing, they don't expect much consultancy skills. Tensing helps new employees with developing skills like problem solving skills and working with applications.

Mandy tells about her study that creating maps was a big part. Something she missed in her studies was learning to convey the message to others. This is specifically relevant for consultancy work, as she works a lot with clients. Creating things without technical details, which clients will understand, is something she did not learn. She mentions that working with specific functions in applications, like using layouts in ArcGIS pro, was something she never uses anymore. The application ArcGIS is used a lot in her work. Also, the application FME is used often, which she did not learn anything about in her studies, even though she mentions that all companies they work with use it. In general, for GIS studies, a great improvement would be to have more focus on the basics of applications and programs mainly used in the industry.

When asked in what way Tensing encourages employees to improve their abilities and learn new things, she mentioned that the young professional program is an example of this. It is 25 days of learning new skills and applications offered by the company. On top of this, Tensing has a day on which all employees come together to present new finds and explain how things work others use. On this day you can join workshops that show new functionalities or software. Tensing wants to be an expert in FME and ESRI, so employees get opportunities to use their time to dive into those applications and learn more. Their knowledge is then shared with colleagues, for example through questions and presentations on Teams. Lastly, the employees make a yearly personal development plan in which they mention what they want to develop for themselves.

In the next part of the interview, we went through the ACRL visual literacy standards and talked about their importance in the study and work environment. About the first standard she mentions that for her work it's not extremely important, but the basics are expected knowledge. Also, in education defining the need for visualizations was mostly expected knowledge. There were not really any guidelines taught, except for some GIS specific visualizations. General feedback on this standard was missed by her. Standard two, finding data, was left for the students themselves in her studies. Most students had their own way of finding relevant visualizations. In her work finding data is not that important, as most of the data is from the clients themselves and a search is not needed. Standard three, interpretation and analysis, is a very important standard. There was often focus on this and it was handled a lot throughout her studies. Also, in her work field she mentions it is an important skill to have and is used often. Standard four was missing in her studies. Evaluating visualizations was handled, however evaluating sources, and looking at the metadata was overlooked in the studies. She did learn to look at the sources on a basic level, but mentions she wanted some more education on the general evaluation aspect and the ways to do this. This is also something that comes back in her work, as sometimes she has difficulty deciding whether to use something or not, however it is not something that delays her work. Standard five, using effectively, was handled quite a lot in her studies. For all assignments, there was focus on this standard for different kinds of actors. Creating data visualizations, standard six, was handled a lot for the specific software used in the studies. On top of that, theory about this was taught, resulting in a good base knowledge of creating visualizations. She mentions that this is also one of the biggest focuses in her working environment. The last standard, use ethically and cite, came forward very little in her studies, and only superficial. In her work, the knowledge of how to do this is very important, as it might result costly mistakes and sharing of private information. Citing was taught extensively and is used somewhat less in her work, which is mostly because of the type of data she uses. In the end she mentions standard 2 and 4 were missing during her studies. Standard 1, 3, 5 and 6 are things that someone should have knowledge of, and being able to work with this individually is important. If there is a lack of knowledge about the other standards, it can be taken care of in the company itself.

Her last comment on the completeness of data visualization studies is that there is a lot of superficial education of subjects. There is almost no option to become an expert in something in certain subjects. Also, the use of older applications and software needs to change, studies need to adapt more to the current working environment.

2.2 Data Analyst & Customer Success Specialist at Orbital Eye

Julia Llort did her bachelor's degree in Spain in GIS and followed a GIS master's in Wageningen. She graduated in 2023, after which she landed a work position at Orbital Eye as a Data Analyst & Customer Success Specialist. The company works with satellite data, both optical and radar. She works in three areas in the company, data analysis, research, and customer success. In data analysis they are surveilling supply pipelines ranging from gas to water and oil where they detect third party interferences. This means monitoring the ground above the pipelines. Watching if there's any changes on the ground surface that may damage the pipelines below ground, and that there's no foreign object that may harm the network (for example: piling up heavy objects over the pipeline). When the pipelines go near groundworks, construction sites, or other possible risk areas, the company also lets the operators of the pipeline know. In research, they want to optimize the systems to reduce the workload and make it easier to gather and analyze data. Also finding and testing new ways of monitoring with other data or tools. Another side of the research team works on machine learning and deep learning for automizing the workflows and detect possible interferences using AI tools. The last part, customer success, serves as the bridge of dialogue between the company, application, and end

user. The company itself is a startup with around 25 employees. The employees are mostly engineers in remote sensing, but also others like informatics, aerospace, and researchers like a doctorate in machine learning.

When asked what visualization types they use, Julia mentioned that what they display for the clients is mainly a base map made of optical data from the satellite images, and then provide high resolution images on top of that when they observe any possible interference with the pipeline. They work with pipelines where buffers are made around, where third party interferences are detected upon, represented by points and polygons. They also work with widgets for the clients so they can see for example overlays of vegetation in raster data.

For Orbital Eye, data visualization is their main focus. It's important for them that the clients can integrate their own workflow with the application or platform they provide, instead of just providing visualizations. Also, performance analysis is done extensively to be able to improve, using machine learning algorithms applied to the images. Most tools and applications they use in the company are created within the company, but they also use software like QGIS. As Julia does not work in the back end of the company, she has not much knowledge about this.

When new employees join the company, it is important to have worked with satellite data before, they also offer a course on remote sensing to be completed in the first months of starting to work in Orbital Eye, but previous knowledge on the field is appreciated. Another plus is to have experience in programming, as they use a lot of Python. Also experience in machine learning is greatly appreciated. Being open to working with people and being organized are skills that are important for the company. Also being able to simplify output and work for the clients is necessary. During office hours, employees can take courses that are available for them within the company and from externals. Also, when there is a knowledge gap, research is done on the subjects which are shared with colleagues by collaboration and discussion. If any skills are missing, the new employees get extra attention for the first few months to adapt to the company.

In the next part of the interview, we went through the ACRL visual literacy standards and talked about their importance in the study and work environment. About the first standard, she mentions that it is quite preset in her work. With all new requests they get from clients, Orbital Eye evaluates whether they can provide the service and if it is worth it. This is done in dialogue with the client. Julia did this more in her bachelor than in the master. Important was learning to keep data visualizations as simple as possible and to have as much information as possible. The second standard, find and access images and media, is very important for her company. Especially when developing new tools. You need to find and access resources that are approved when using commercially. Also keeping the information clean when documenting your findings is important. In her study, almost always data was already provided and was clean. In her work, she works with raw data. Pre-processing data was a bit abandoned in her studies, although it is needed in the industry a lot. The third standard is used in her work often too. Remote sensing data needs interpreting and analyzing before you can get any results. It is not like you get a colorful picture of the changes in an environment. She is happy that in the studies there was quite some interpretation in radar. Most of these courses were optional, which was perfect for her interests. Also, standard four, evaluate images, is used in her work. The images they use need to be evaluated and see that they fit the standards used. It is a long learning curve to be able to evaluate radar images. This is something she learned at her job and was not taught in her studies. She mentioned that she would expect to learn later, as it is based on the clients and the specifics of the job. However, when talking about presenting your findings, she mentions that she missed learning how and why certain things are displayed. This links to the fifth standard, where she adds that it is very important for her job, as clients need to easily understand what you talk about. The clients need to

understand the meaning behind the insights you present, as they need to use them and work with the results. When designing a good product, it will be easier to use as well. Especially working in customer success, you need to know what the customer requires. This was not taught a lot in her studies, except in ACT, however she mentions it is way more important in the working environment than she understood from these courses. About standard six, creating visual media, she mentions that it is one of the most important standards, also because it is linked to using visuals effectively. This standard has been taught extensively in her studies. Standard seven is also important in her work, for example because you cannot share data from one client with another client. In her studies, this was not something she was taught. Most people will not even think about where data comes from, or what permissions, requirements and limitations data have. Most of the data she uses in her work and research is not commercially available. This is a learning curve as soon as you step into the working force. Julia would not expect a course to be there to learn this, however working with manuals on how to handle data to know what to consider after studying can be an addition.

In the end Julia mentions all the standards are important and complement each other. Most of the standards, except five and seven, were taught in the studies. Standard five especially in presenting. When asked what could be better in data visualization studies, she mentions there is a lot of focus on technical skills, and she would like to see more practical education. A very good thing in education in the Netherlands is the internships. Being able to have those months to learn the ropes in its basics is a valued addition to study programs. Also, the non-compulsory courses like in her case remote sensing are great, as it gives the opportunity to dive into a subject further when you want to.