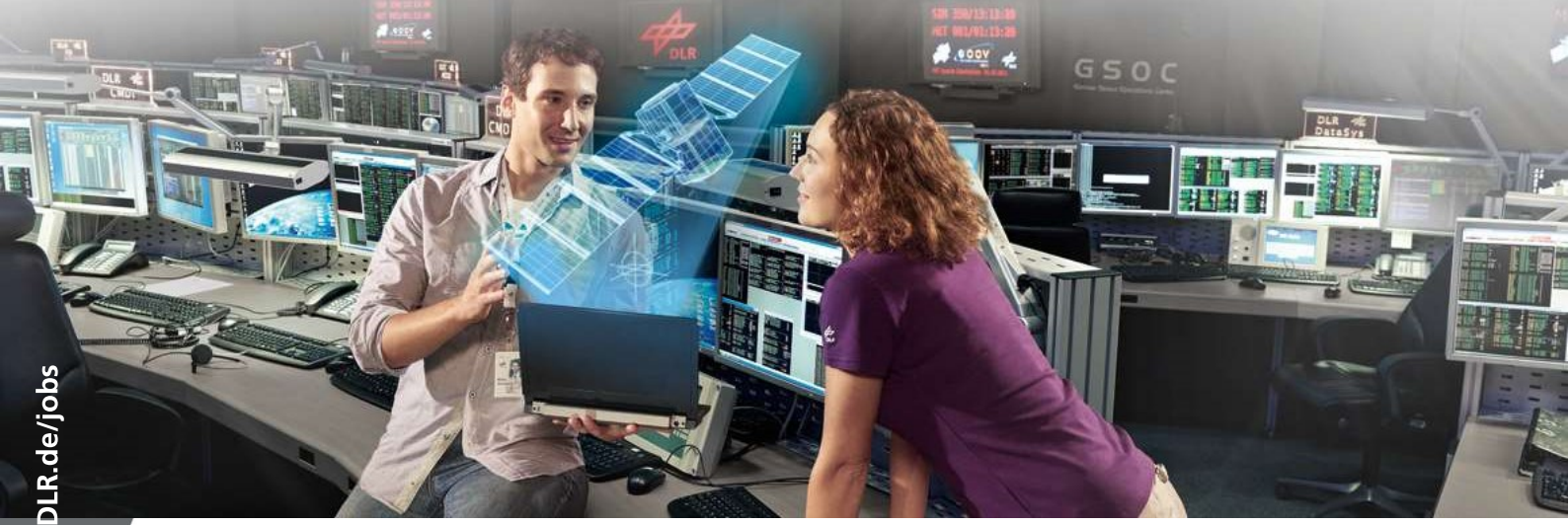

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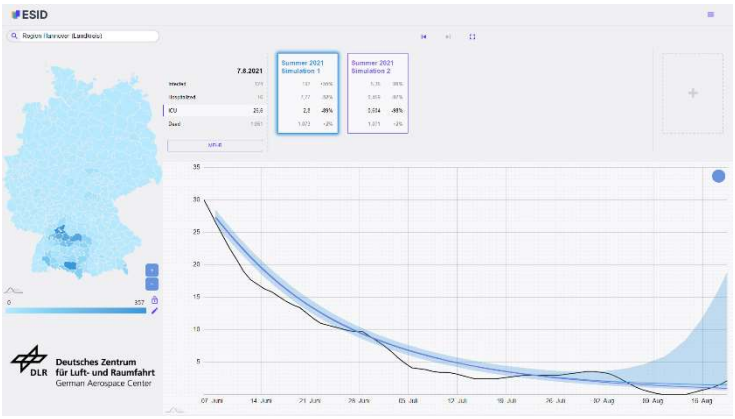


For our DLR **Institute for Software Technology** in **Braunschweig**, we search a

Master Student

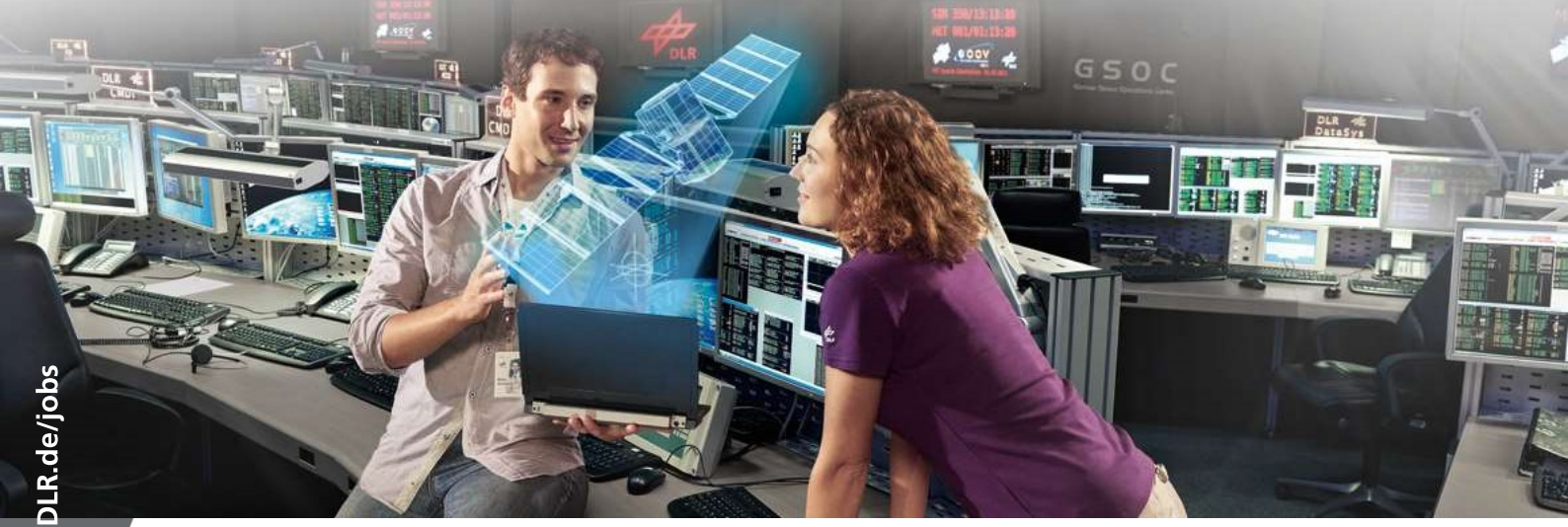
to work on **A Visualization Task Taxonomy for Pandemic Analysis**

Your mission:

Visual Analytics of pandemics or epidemics shows the disease's spread and unveils unknown patterns. It assists policymakers and health institutions in mitigating pandemic effects, creating interventions, and understanding the situation to derive effective mitigation measures. These tools are also open to the public so that decision processes can be traced and better understood to improve the acceptance of the measures taken. However, the development of such tools is a challenging affair. To begin, the definition of the exploratory task, which can be as broad as 'to understand the spread of the disease', is hard to refine into subtasks, and potential analytical tasks involved in the exploration are not known at the outset. For example, 'spread', in this context, could mean an analytic task to determine the distribution of the infected population, or it could also mean deriving the network of contacts of infected agents. In constructing visualization tools, a designer needs crisp and well-defined tasks to encode them into suitable visual artefacts. For example, the visual encoding of an exploratory task, i.e. spatial distribution with geographical coordinates data, is done by a map. Then the distribution of data is either shown via an overlaid visual mark or via colour saturation. Timelines or line charts show the temporal trends.

Another problem is that different groups of users have their own domain-specific vocabulary for describing problems and their specific anticipation of the solution. For example, policymakers might be interested in knowing a general infection trend to propose suitable measures. In contrast, citizens might be more interested in knowing the local hotspots to avoid going there.

Thus, eliciting system requirements are demanding, and a clear understanding of the tool's usage is a non-trivial problem. A range of human-centered approaches can facilitate this process. However, studies show that



in most cases, users typically cannot directly articulate their analysis needs in a clear-cut way. Moreover, such techniques might not provide a plausible result for the applications that are going to be used by diverse group of users. Here, indirect ways of task gathering or generation can be applied.

For example: by following this systematic approach, one can use formal logic to infer visualisation tasks and to guide data visualization process. This ensures that the visualisation accurately reflects the patterns and relationships inferred from the data. This further can be structured into a task taxonomy and can be validated with users or through models.

This is only one approach to address the aforementioned problem. We encourage students to come up with their own research directions. We also welcome discussing any innovative ideas that matches to the scope of this thesis. You can start immediately.

Desired qualification:

- Studies with a computer science background
- Good programing skills in JavaScript, Python
- Good knowledge of data science concepts – Formal Logics, NLP, Text mining and knowledge engineering
- Understanding of web development frameworks like React, Angular is a plus
- Understanding of mathematical model validation is a plus

For more information, contact
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