

Moving visualization design for video games

Details

Advisor

Lijie Yao, lijie.yao@inria.fr

Petra Isenberg, <https://petra.isenberg.cc>, petra.isenberg@inria.fr

Internship Location

Bât 660, Digiteo Moulon, Université Paris-Saclay, 91190, Gif-Sur-Yvette

Topic

Visualizations are often useful in contexts in which the display or observer does not remain static but is moving at various speeds. A common example comes from video games where health bars always move with game characters. However, with varying backgrounds and the overall game environment (contextual factors), even a simple chart could become hard to read, particularly when the visualization is under motion.

This internship targets two main research questions:

- 1) How are visualizations in motion currently designed for the video gaming context?
- 2) How effective are different types of visualization in motion in different gaming contexts?

These two research questions will be targeted by the following research steps:

- Investigate and classify different kinds of contextual factors of video games (literature and game analysis)
- Categorize existing visualizations shown under motion in video games
- Explore the impact of 1-2 contextual factors on reading performance of visualization in motion in a gaming context
- If time permits: Design our own Visualization in Motion for video games and evaluate

The duration will be 6 months (graduated internship / stage fin d'étude), start time will not be later than the end of March 2022. We are looking for someone who is interested in this topic, has experience in playing video games, and a background in computer science / human-computer interaction. Web development skills (e.g.

HTML, CSS, JS, PHP, etc) and design knowledge (e.g. Adobe Illustrator) will be needed and an interest in a future publication would be a plus.



Background

The main research area of this internship is situated visualization in motion and game visualization. In a situated data visualization, the data is directly visualized near the physical space, object, or person it originates from [Willett et al., 2017]. Visualization in motion is a new research topic in the visualization community and there is no dedicated research on this topic yet beyond our poster published at IEEE VIS 2020 [Yao et al., 2020]. Based on our submitted article, we defined visualization in motion as visual data representations used in contexts that exhibit relative motion between a viewer and an entire visualization. In the example of playing video games, the player is the viewer who stays static in front of the screen, the health bars moving on the screen are the moving visualizations, the relative movement exists between the player and the bars. In the domain of game visualization, there exists past research on game vis design space [Bowman et al., 2012], however, it lacked a discussion when characteristics of motion were involved - so the internship has a very high potential to contribute new knowledge in this space and lead to a scientific publication. Contact us for our recent paper that is still under submission.

Wisley Willett, Yvonne Jansen, and Pierre Dragicevic. Embedded data representations. IEEE TVCG, 23(1):461–470, Jan. 2017.

<https://hal.inria.fr/hal-01377901>

Lijie Yao, Anastasia Bezerianos, Petra Isenberg. Situated visualization in motion.
Poster of IEEE VIS 2020, Salt Lake city, USA, Oct, 2020.

<https://hal.inria.fr/hal-02946587v2>

Brian Bowman, Niklas Elmqvist, T.J. Jankun-Kelly. Toward Visualization for Games:
Theory, Design Space, and Patterns, IEEE TVCG,18(11):1956-1968, Nov. 2012.

<https://ieeexplore.ieee.org/document/6165280>