Lijie Yao 姚李捷

Bât 660, Université Paris-Sud, 91405 Orsay Cedex, France
E-mail: yaolijie0219@gmail.com | Tel: +33 6 58 71 00 98
Personal Page: lijieyao.com
ORCID: 0000-0002-4208-5140 | Google Scholar: W-fVL00AAAAJ

About Me

Lijie Yao 姚李捷 is a last-year Ph.D. candidate at the AVIZ team, Inria Saclay, and University Paris-Saclay, supervised by Dr. Petra Isenberg and Dr. Anastasia Bezerianos. Her Ph.D. thesis is on "Situated Visualization in Motion". Her work focused on exploring the impact of motion and spatial factors on visualizations' perception and how to design visualizations under motion in real application scenarios. She got her M.S. degree in Computer Science from University Paris-Saclay in 2020 and her M.Eng degree in Electrical and Computer Engineering from Polytech Lille in 2019. She received her B.Eng in Electronic and Information Engineering from XIDIAN University in 2018. She is now open to work or a postdoc position.

Research Area

- Human-Computer Interaction: Specifically focus on Visual Analytics & Information Visualization.
- Situated Visualization in Motion: Interested in exploring the impact of motion & spatial factors on visualizations' perception and how to design visualization in real application scenarios.
- Mobile & Wearable Devices: Mainly explore real data needs mining according to different using scenarios and the methodology to design efficient mini data dashboards.

Education

09/2020 – 12/2023 **Université Paris-Saclay** Gif-sur-Yvette, France
Ph.D. - Computer Science
· Ph.D. Thesis: Situated visualization in motion
· Supervisors: Dr. Petra Isenberg and Dr. Anastasia Bezerianos

09/2019 – 09/2020 **Université Paris-Saclay** Gif-sur-Yvette, France
M.S. - Computer Science
· Master Thesis: Situated visualization in motion
· Supervisors: Dr. Petra Isenberg

09/2017 – 09/2019 **Polytech Lille** Lille, France
M.Eng - Electrical and Computer Engineering
· Master Thesis: Position Control of A Drone
· Supervisors: Dr. Komi Midzodzi Pekpe

08/2014 – 08/2017 **XIDIAN University** Xi'an, China
B.Eng - Electronic and Information Engineering
· Bachelor Thesis: Electronic Necklace for Health Monitoring
· Supervisors: Dr. Xavier Redon and Dr. Alexandre Boé

Work Experiences

07/2023 – Present **University of Calgary** Calgary, Canada
Visiting Researcher
- Project: Situated Visualization in Motion for Mobile & Wearable Devices
- Team: DATA X EXPERIENCE LAB
- Supervisor: Dr. Wesley Willett & Dr. Petra Isenberg

01/2022 – 03/2023 **Université Paris-Saclay** Gif-sur-Yvette, France
Teaching Assistant

09/2020 – Present **Inria** Gif-sur-Yvette, France
Doctoral Researcher
- Team: AVIZ

03/2020 – 09/2020 **Inria** Gif-sur-Yvette, France
Research Intern
- Team: AVIZ

03/2019 – 09/2019 **Saint-Gobain** Compiègne, France
Maintenance Management Intern
- Independently managed and completed two diffusable projects, collected and analyzed data, and communicated among different cultures.

06/2018 – 08/2018 **MCC HUATIAN Engineering and Technology Corporation** Nanjing, China
Front-end Developer
- Implemented a website that offered user management services.

Languages

- Chinese: Native speaker
- English: Professional working proficiency (Level: C1)
- French: Professional working proficiency (Level: C1)

Publication

- Lijie Yao, Anastasia Bezerianos, Romain Vuillemot, Petra Isenberg. Visualization in Motion: A Research Agenda and Two Evaluations. *IEEE Transactions on Visualization and Computer Graphics (TVCG), 2022, 28(10), pp. 3546-3562,* ⟨10.1109/TVCG.2022.3184993⟩, ⟨hal-03698837⟩.

  Abstract:

  We contribute a research agenda for visualization in motion and two experiments to understand how well viewers can read data from moving visualizations. We define visualizations in motion as visual data representations that are used in contexts that exhibit relative motion between a viewer and an entire visualization. Sports analytics, video games, wearable devices, or data physicalizations are example contexts that involve different types of relative motion between a viewer and a visualization. To analyze the opportunities and challenges for designing visualization in motion, we show example scenarios and outline a first research agenda. Motivated primarily by the prevalence of and opportunities for visualizations in sports and video games we started to investigate a small aspect of our research agenda: the impact of two important characteristics of motion—speed and trajectory on a stationary viewer's ability to read data from moving donut and bar charts. We found that increasing speed and trajectory complexity did negatively affect the accuracy of reading values from the charts and that bar charts were

more negatively impacted. In practice, however, this impact was small: both charts were still read fairly accurately.

- Yvonne Jansen, Federica Bucchieri, Pierre Dragicevic, Martin Hachet, Morgane Koval, Léana Petiot, Arnaud Prouzeau, Dieter Schmalstieg, Lijie Yao, Petra Isenberg. Envisioning Situated Visualizations of Environmental Footprints in an Urban Environment. *In Proceeding of IEEE VIS 2022 Workshop on Visualization for Social Good workshop (VIS4Good), October 2022, Oklahoma, United States.* ⟨hal-03770857⟩.

  Abstract:

  We present the results of a brainstorming exercise focused on how situated visualizations could be used to better understand the state of the environment and our personal behavioral impact on it. Specifically, we conducted a day long workshop in the French city of Bordeaux where we envisioned situated visualizations of urban environmental footprints. We explored the city and took photos and notes about possible situated visualizations of environmental footprints that could be embedded near places, people, or objects of interest. We found that our designs targeted four purposes and used four different methods that could be further explored to test situated visualizations for the protection of the environment.

- Alaul Islam*, Lijie Yao*, Anastasia Bezerianos, Tanja Blascheck, Tingying He, Bongshin Lee, Romain Vuillemot, Petra Isenberg.. Reflections on Visualization in Motion for Fitness Trackers. *In Proceeding of MobileHCI 2022 Workshop on New Trends in HCI and Sports (NTSPORT)*. September 2022, Vancouver, Canada. ⟨hal-03775633⟩

  Abstract:

  In this paper, we reflect on our past work towards understanding how to design visualizations for fitness trackers that are used in motion. We have coined the term "visualization in motion" for visualizations that are used in the presence of relative motion between a viewer and the visualization. Here, we describe how visualization in motion is relevant to sports scenarios. We also provide new data on current smartwatch visualizations for sports and discuss future challenges for visualizations in motion for fitness trackers.

  ** These authors contributed equally.*

- Federica Bucchieri, Lijie Yao, Petra Isenberg. Situated Visualization in Motion for Video Games. *Posters of the European Conference on Visualization (EuroVis), June 2022, Rome, Italy.* ⟨10.2312/evp.20221119⟩, ⟨hal-03694019⟩.

  Abstract:

  We contribute a systematic review of situated visualizations in motion in the context of video games. Video games produce rich dynamic datasets during gameplay that are often visualized to help players succeed in a game. Often these visualizations are moving either because they are attached to moving game elements or due to camera changes. We want to understand to what extent this motion and contextual game factors impact how players can read these visualizations. In order to ground our work, we surveyed 160 visualizations in motion and their embeddings in the game world. Here, we report on our analysis and categorization of these visualizations.

- Lijie Yao, Anastasia Bezerianos, Romain Vuillemot, Petra Isenberg. Situated Visualization in Motion for Swimming. *Poster of the France National Conference on Visualization (Journée Visu), June 2022, Bordeaux, France.* ⟨hal-03700406⟩.

  Abstract:

  Competitive sports coverage increasingly includes information on athlete or team statistics and records. Sports video coverage has traditionally embedded representations of this data in fixed locations on the

screen, but more recently also attached representations to athletes or other targets in motion. These publicly used representations so far have been rather simple and systematic investigations of the research space of embedded visualizations in motion are still missing. Here we report on our preliminary research in the domain of professional and amateur swimming. We analyzed how visualizations are currently added to the coverage of Olympics swimming competitions and then plan to derive a design space for embedded data representations for swimming competitions. We are currently conducting a crowdsourced survey to explore which kind of swimming-related data general audiences are interested in, in order to identify opportunities for additional visualizations to be added to swimming competition coverage.

- Federica Bucchieri, Lijie Yao, Petra Isenberg. Visualization in Motion in Video Games for Different Types of Data. *Poster of the France National Conference on Visualization (Journée Visu), June 2022, Bordeaux, France.* ⟨hal-03700418⟩.

  Abstract:

  We contribute an analysis of situated visualizations in motion in video games for different types of data, with a focus on quantitative and categorical data representations. Video games convey a lot of data to players, to help them succeed in the game. These visualizations frequently move across the screen due to camera changes or because the game elements themselves move. Our ultimate goal is to understand how motion factors affect visualization readability in video games and subsequently the players' performance in the game. We started our work by surveying the characteristics of how motion currently influences which kind of data representations in video games. We conducted a systematic review of 160 visualizations in motion in video games and extracted patterns and considerations regarding was what, and how visualizations currently exhibit motion factors in video games.

- Lijie Yao, Anastasia Bezerianos, and Petra Isenberg. Situated Visualization in Motion. *Posters of the IEEE Conference on Visualization (InfoVis), October 2020, Salt Lake City, United States.* ⟨hal-02946587v2⟩.

  Abstract:

  We contribute a first design space on visualizations in motion and the design of a pilot study we plan to run in the fall. Visualizations can be useful in contexts where either the observation is in motion or the whole visualization is moving at various speeds. Imagine, for example, displays attached to an athlete or animal that show data about the wearer – for example, captured from a fitness tracking band; or a visualization attached to a moving object such as a vehicle or a soccer ball. The ultimate goal of our research is to inform the design of visualizations under motion.

Teaching

Université Paris-Saclay

- 2022/2023 Master course: *Interactive Information Visualization*
- 2021/2022 Master course: *Interactive Information Visualization*

Service

Review

- 2023 IEEE Information Visualization Conference (InfoVis)
- 2023 25th EG Conference on Visualization (EuroVis)

- 2023 ACM Conference on Human Factors in Computing Systems
- 2022 IEEE Information Visualization Conference (InfoVis)
- 2022 ACM SIG International Conference on Computer Graphics and Interactive Techniques (SIGGRAPH Asia)

Student Volunteer

- 2020 IEEE Information Visualization Conference (InfoVis)
- 2021 IEEE Information Visualization Conference (InfoVis)
- 2022 EG Conference on Visualization (EuroVis)

Supervision

Federica Bucchieri

- 03/2022 - 08/2022, Master's graduation level research internship, Human-Computer Interaction, Université Paris-Saclay