Bivwac — Building Immersive Visualizations for Welfare, Awareness, and Comprehension

Bivwac (www.bivwac.fr) is a joint research team between Inria (centre de l'université de Bordeaux) and the CNRS (LaBRI). The team's mission is to study new forms of interactive visualization that improve understanding of complex data and phenomena, and to develop tools that effectively transmit and advance knowledge in support of a sustainable and desirable future.

The Bivwac team includes four permanent (tenured) research scientists: Martin Hachet (team leader https://people.bordeaux.inria.fr/hachet/), Yvonne Jansen (https://yvonnejansen.fr/), Pierre Dragicevic (https://dragice.fr/), and Benjamin Bach (https://benjbach.github.io/).

Research vision

Bivwac seeks to make complex data and real-world phenomena accessible to non-experts by developing new ways to explain, explore, and experience knowledge. Across domains such as environmental issues, mental health, and advanced science, relevant data and expertise often remain abstract and difficult to grasp, limiting informed decision-making and action. Bivwac's overarching aim is to improve knowledge dissemination and comprehension in support of societal well-being and the United Nations Sustainable Development Goals.

The team investigates how visualization experiences can enhance understanding by engaging users cognitively, perceptually, and emotionally. These experiences range from interactive desktop and web-based visualizations, dashboards, and open online platforms (e.g., visualization atlases) to more immersive, situated, and experiential setups. Bivwac focuses on highly interactive and explorable visualizations, concrete visual metaphors, data-driven storytelling, data comics, and other emerging formats that promote active sense-making rather than passive consumption.

Visualization is interpreted broadly, encompassing data visualizations, diagrams, images, videos, visual narratives, and physical and tangible artefacts. Learning is approached as an experiential process, where understanding is improved through interactive exploration and deliberate design of how data and phenomena are presented. Interactivity, explorable explanations, and collaboration are core principles, enabling users to test assumptions, explore alternatives, and learn collectively.

Bivwac applies this research to high-impact domains, including environmental challenges, education in complex scientific topics, and global welfare issues such as health and humanitarian concerns. By prioritizing comprehension, awareness, and meaningful engagement over productivity alone, Bivwac aims to design and evaluate visualization approaches that foster informed reflection, dialogue, and lasting behavioral change.

Areas of expertise

Research fields: human-computer interaction, information visualization.

Keywords: narrative visualization, visualization atlases, concrete visualizations, beyond-desktop visualization, situated visualization, data physicalization, mixed-reality systems, tangible user interfaces, perception and decision making with data visualizations, transparency, open data, environmental data, humanitarian data, statistical communication.

Expertise: academic research, design and prototyping of novel interactive systems, human-centered design, study of interactive systems (human-subject experiments, quantitative and qualitative methods), conceptual frameworks, statistics and study methodology, open science and transparent research (incl. preregistration).

Statement of interest

The Bivwac team is highly interested in the upcoming HORIZON calls, notably the call **HORIZON-CL5-2026-07-D1-04** – **Fighting disinformation and effectively communicating on climate change** which closely matches the team's mission to improve understanding, communication, and scrutiny of climate data through interactive and collaborative visualization. The call's focus on combating climate disinformation, strengthening trust in science, and engaging citizens aligns directly with Bivwac's work.

The research team brings expertise in designing and evaluating visualization experiences and platforms that make complex, dynamic climate information accessible and trustworthy for non-specialist audiences. This includes data-driven storytelling, visualization atlases, visual cues for data provenance and credibility, and immersive and mixed-reality experiences. These approaches may help support effective, tailored communication, fact-checking, and participatory engagement, while avoiding climate anxiety. As part of its future research, Bivwac is interested in studying how visualization can support justified trust, help people assess credibility, and address misinterpretation and deceptive representations, rather than assuming that access to correct information alone is sufficient to counter disinformation.

Finally, Bivwac is aligned with the call's emphasis on interdisciplinary research, real-world deployment, and international collaboration. Building on existing partnerships with climate scientists and institutions in Europe and worldwide, the team aims to contribute empirical results and tools that help translate climate knowledge into informed public understanding and decision-making.