Title: Augmented-Reality Data Visualizations for Presenting Environmental Data

Advisors: Leni Yang (leni.yang@inria.fr)

Keywords: Augmented reality, human-computer interaction, computer graphics, environmental data, sustainability

Host team:

The internship will be conducted within the **Bivwac** team (https://bivwac.fr) at Inria Bordeaux, as part of the **Be·aware project** (https://beaware.inria.fr/) — a research project focused on enhancing environmental awareness through interactive and immersive technologies.

Context:

Understanding and acting on environmental data is often challenging because environmental consequences can feel distant from our daily lives. This "psychological distance" makes it difficult for people to connect their everyday behaviors and decisions to their environmental impacts. To bridge this gap, our research explores how **Augmented Reality (AR)** and **data visualization** can work together to make environmental data more tangible and relatable.

- **Data visualization** helps present environmental data in clear and concrete ways.
- **AR** enables these visualizations to be integrated directly into everyday environments, creating interactive and immersive experiences.

An example approach is to present waste data through concrete visualizations in AR, helping people better grasp the scale and impact of environmental issues [1]. Beyond visualization, combining AR and data visualization also opens new opportunities for interactive and immersive experiences. For instance, this work explores large-scale AR visualizations that invite people to explore data by walking, leveraging human spatial understanding to make data more intuitive [2].

Objectives:

This internship would particularly focus on exploring AR-based interactions and visualizations for communicating large magnitude environmental data---data that features large numbers, often combined with large ratios or differences between values, or ranges spanning multiple orders of magnitude.

Internship tasks:

As an intern, you will participate in **one or more** of the following:

- **Developing proof-of-concept prototypes** that integrate AR and data visualization techniques to realize design ideas

- **Developing tools or automatic methods** that allow others---such as researchers or practitioners---to implement and extend the design ideas in their own contexts

Preferred skills:

Candidates with one or more of the following skills are preferred:

- Augmented reality development (e.g, WebXR, Unity, Gotdot)
- Computer graphics techniques
- Web developments

How to apply:

Please send your CV and Master transcript to the contacts below. In your email, please briefly explain your motivation for applying.

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References:

[1] Assor, Ambre, et al. "Augmented reality waste accumulation visualizations." ACM Journal on Computing and Sustainable Societies 2.2 (2024): 1-29.
[2] Ferron, Aymeric, Yvonne Jansen, and Martin Hachet. "AROM: Rambling Along Data in Augmented Reality to Explore Large Order of Magnitude Values." Workshop on Visualization for Communication at the 2025 IEEE Visualization Conference. 2025.