

Internship offer **THALES**

4-6 months



Title

Development of a Modular Immersive Platform for Operational Context Simulation (PLAT-IMCO)

Contacts and supervision

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Industrial Partner: Thales DMS

Keywords

Virtual Reality, Augmented Reality, Simulation, Visualization, Human-System Interaction, Unity, Prototyping

Location

IMT Atlantique (Campus de Brest)
655 Av. du Technopôle
29280 Plouzané

Context

The **PLAT-IMCO** project aims to create a **modular immersive platform (AR/VR/2D)** dedicated to the **simulation, visualization, and demonstration of critical operational scenarios** involving complex interactions between humans, AI, and embedded systems.

The project is a **collaboration between IMT Atlantique and Thales DMS**, combining academic expertise in immersive systems and human factors with industrial needs in decision-making, defense, and control systems.

The platform will serve as a **common technical foundation** to visualize dynamic and data-driven scenarios—such as tactical war rooms, electronic warfare, or cooperative air control—across different devices and modalities (VR headsets, AR tablets, or desktop screens).

Internship Description

The internship will focus on **developing the first functional prototype** of the PLAT-IMCO immersive platform.

This prototype will allow the visualization of simplified, data-driven scenarios simultaneously in **VR, AR, and 2D**, supporting modular data injection and scripted events.

The main tasks of the internship include:

1. **Technical review** – Survey existing immersive visualization frameworks and synchronization methods for multi-device environments (Unity XR, WebXR, AR Foundation, network APIs).
2. **Architecture design** – Define a shared scene model and data structure that can be rendered consistently in VR, AR, and 2D.
3. **Prototype implementation** –
 - Develop the visualization environment using Unity (AR/VR toolkit).
 - Implement simple scripted scenarios (object movement, timed events, signal overlays).
 - Enable deployment on several terminals (VR headset, AR tablet, desktop PC).
4. **Scenario demonstration** – Integrate a **fictitious but credible use case** (e.g., tactical map or signal visualization) for internal presentation and evaluation.
5. **Testing and documentation** – Evaluate usability, performance, and reliability; prepare documentation and a demonstration video.

If time allows, the internship may also explore optional extensions such as:

- Spatial anchoring and stability in augmented environments.
- Improved synchronization between devices (multi-client networking).
- Integration of realistic data simulation scripts.

Expected Outcomes

- A **working immersive demonstrator** (VR/AR/2D) based on a modular architecture.
- Documentation for deployment and configuration.
- A short **demo video** and technical report.

Profile and Skills

- Student in computer science, virtual/augmented reality, human–computer interaction, or equivalent.
- Skills in **Unity 3D**, C#, and basic **networking or data visualization**.
- Interest in immersive systems, simulation, and user experience design.
- Knowledge of VR/AR hardware (Meta Quest, HoloLens, etc.) appreciated.

References

- LaViola Jr, J. J., Kruijff, E., McMahan, R. P., Bowman, D., & Poupyrev, I. P. (2017). *3D User Interfaces: Theory and Practice*. Addison-Wesley.
- Dey, A., Billinghamurst, M., Lindeman, R. W., & Swan, J. E. (2018). *A Systematic Review of 10 Years of Augmented Reality Usability Studies: 2005 to 2014*. *Frontiers in Robotics and AI*, 5.
- Endsley, M. R. (1995). *Toward a Theory of Situation Awareness in Dynamic Systems*. *Human Factors Journal*, 37(1), 32–64.
- Steed, A., & Julier, S. (2013). *Design and Implementation of an Immersive Virtual Reality System Based on a Smartphone Platform*. *IEEE 3DUI*.