

## Project title:

Immersive History with augmented reality

## Partners

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[https://www.youtube.com/watch?v=\\_7CKy\\_ooghY&list=PLiH\\_5LdaV8RyZHWULQrYyiinqoYuhnUrC](https://www.youtube.com/watch?v=_7CKy_ooghY&list=PLiH_5LdaV8RyZHWULQrYyiinqoYuhnUrC)

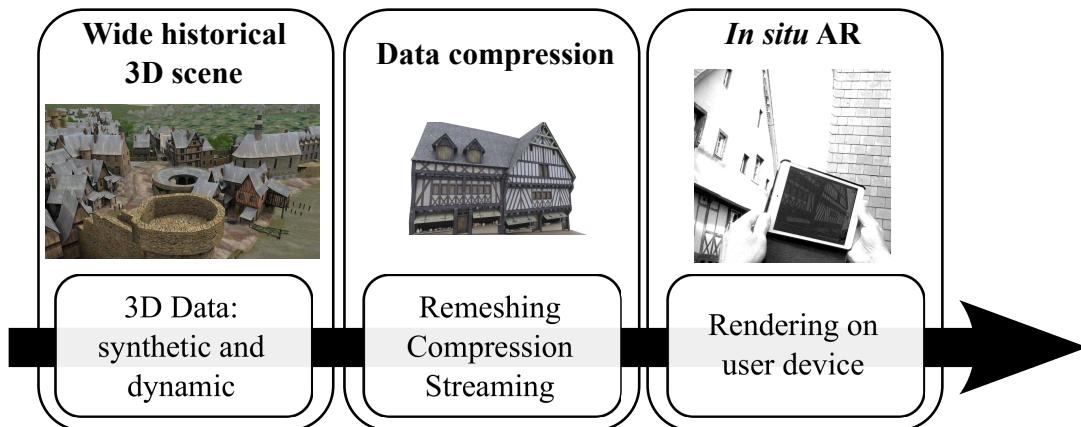
[https://www.youtube.com/watch?v=kW2xmUhi\\_pY&list=PLiH\\_5LdaV8RyZHWULQrYyiinqoYuhnUrC&index=9](https://www.youtube.com/watch?v=kW2xmUhi_pY&list=PLiH_5LdaV8RyZHWULQrYyiinqoYuhnUrC&index=9)

[https://www.youtube.com/watch?v=fULTEp0ZXxE&index=16&list=PLiH\\_5LdaV8RyZH\\_WULQrYyiinqoYuhnUrC](https://www.youtube.com/watch?v=fULTEp0ZXxE&index=16&list=PLiH_5LdaV8RyZH_WULQrYyiinqoYuhnUrC)

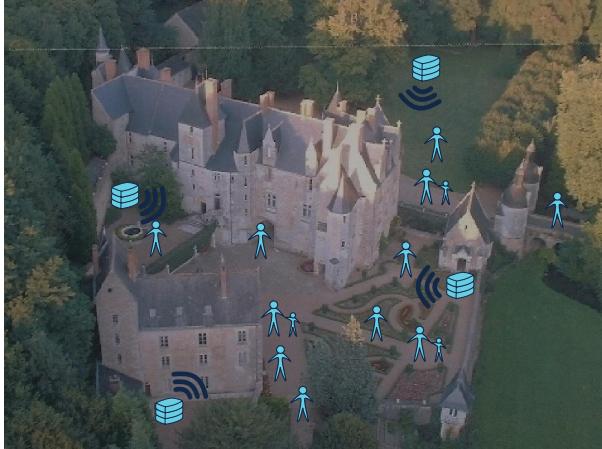
I3S et Cintoo3D: Marc Antonini (am@i3s.unice.fr)

<http://www.microsoft.com/france/hub-presse/communiques-de-presse/fiche-communique.aspx?eid=991fcf75-6b3e-479c-a9aa-33bc7c582915>

## (1) Introduction of the project context



- A synthetic 3D scene, that is *not static* and *wide*, is built, compressed and stored on one or different servers.



- Multiple users are walking in a historical site, with an AR-compatible device (smartphone, tablet, glasses, etc.).
- Some pieces of the 3D scene are sent to the users and displayed in AR mode, *i.e.* in superposition with the real historical scene.
- Users can also interact with the scene and thus perform modifications on the 3D model (object displacement, modification, etc.).

*Important aspects:*

- the complete 3D data is huge (the scene is big, and the graphical model is complex)
- the 3D data is streamed in real-time *as a function of the user navigation*
- the 3D data transmitted to the user *is adapted* to the user device capacity/power
- the user interaction's consequences are visible in real-time for the other users navigating in the scene

## (2) Review of the scientific and technical obstacles

\* **Collaborative visualization:** Organize, compress and stream the data while users are able to modify it such that it impacts the experience of other users.

*Challenges: real time, massive data re-encoding, high interaction quality*

\* **Geometry coding:** develop new geometry compression data, suited for interactivity. More precisely, while changing his viewpoint, a user is able to estimate the part of the geometry that is discovered. The bit stream stored and transmitted to the user should simply correct the estimation error. However, the server does not know precisely what will be the estimation to correct.

*Challenges: play with the randomness of the user navigation, minimize the storage/ bandwidth tradeoff, real-time*

\* **Animated and generated data compression/streaming:** the solution developed by Cintoo 3D is able to compress and stream huge 3D data. However, it needs to be extended to animated and generated data.

*Challenges: deal with motion and complex geometry*

\* **In situ Augmented Reality:** Artefacto has developed solution for *in situ* augmented reality. For our application, one needs to model and learn a real scene (the one in which the users will walk). Moreover, one needs to be able to position the user's device in this scene.

*Challenges: the site is wide and complex to model, the positioning of the user's device is more complex in a big environment*

\* **3D model construction:** graphic designers and historian will build the multimedia data streamed to the users.

*Challenges: fidelity to history and to the site, high quality of experience.*

\* **Demo:** At the end of the project, an end-to-end demo will be available in collaboration with the historical site