DIPTYCH Project
acquisition and rendering of animated furniture for realistic museographic rendering

Keywords: Gaussian Splatting, NERF, Acquisition, Relighting, Appearance, SV-BRDF

Offer: Post-doctoral Contract of 24 months in the Inria Manao Team at Bordeaux (France).
Salary: approx. 2240 euros per month.
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	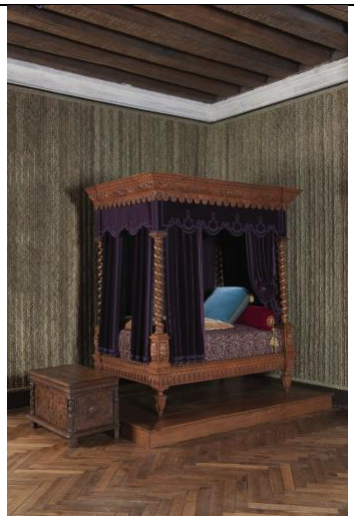	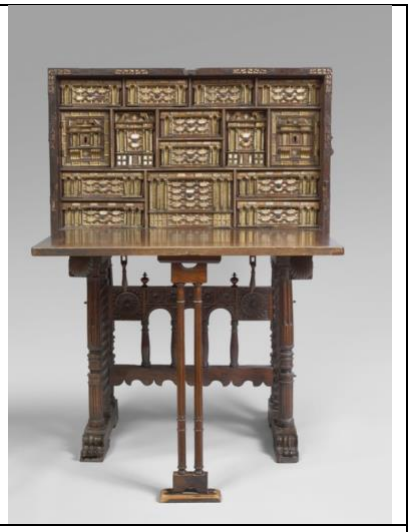
Diptych shutters on Le Corbusier's cabanon	Bed and chest at Château d'Azay-le-Rideau	Bargueno (secretary) at Château d'Azay-le-Rideau

Context and Objectives:

As part of its “CMN Numérique” program, which aims to standardize the production of 3D models and reuse them in a variety of contexts (mediation, maintenance, research, etc.), France's national monuments center (CMN) has produced a collaborative, multi-media real-time 3D experience, featuring an ultra-realistic reproduction of the Château d'Azay-le-Rideau in the Centre Val de Loire region. Developed in Unreal Engine 5, it includes a 3D model of the château's exterior. Today, the park has been reconstructed, including the water mirror, the staircase and four Renaissance rooms. The next step is to virtually furnish these rooms (see images above) with around 10 pieces of furniture (beds, chests, chests of drawers).
CMN is also seeking to restore the diptych shutters of Le Corbusier's cabanon at the Cap Moderne site in the PACA region. They are composed of a mirrored side and a painted side.

Rather than resorting to manual computer graphics work, the general aim of the project is to develop the lightest, most automatic digital acquisition method possible, as well as a real-time rendering method.

Job Description:

The successful candidate will be responsible for the following tasks:

- Develop a lightweight, calibrated acquisition method that can be easily used by museum and heritage site professionals.

- Develop a representation and rendering method associated with the acquisition method in order to:
    - render furniture under different lighting conditions (artificial, outdoor) and from different points of view
    - Animate furniture (e.g., drawers opening)

- Implement the rendering method in an Open-Source protype

- Study the feasibility of integrating the rendering method developed into a commercial engine such as Unreal Engine.

This work will be carried out in conjunction with the Centre des Monuments Nationaux, and will involve travel to both sites and to head office (Paris).

Skills Wanted:

- PhD in Computer Science with a specialization in Computer Graphics or Computer Vision.

- Skills in AI applied to computer graphics are a plus, especially in Gaussian Splattings or NERF.