

Nomad 3D Augmented Reality in Instrument Control

Yannick Le Goc

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THE EUROPEAN NEUTRON SOURCE

Outline

- Introduction
- Nomad & SolidWorks
- Workflow
- Demonstrations
- Conclusion

Introduction



Figaro
Vertical Time-of-Flight Reflectometer

User point of view

- Walls
- Webcams

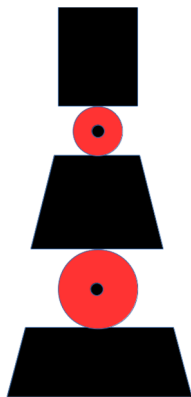
Introduction

Our goal:

- 3D **dynamic** representation
- **Augment the reality** of the user on the instrument
- See **behind** the walls

Animate a 3D model in realtime

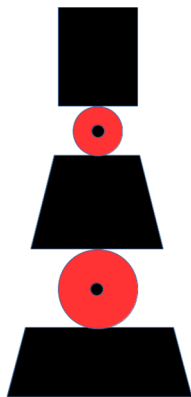
Introduction



Introduction

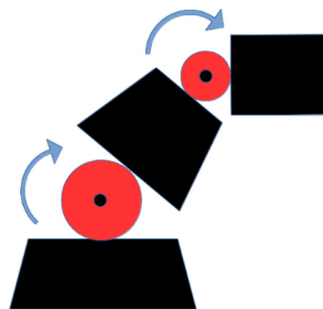


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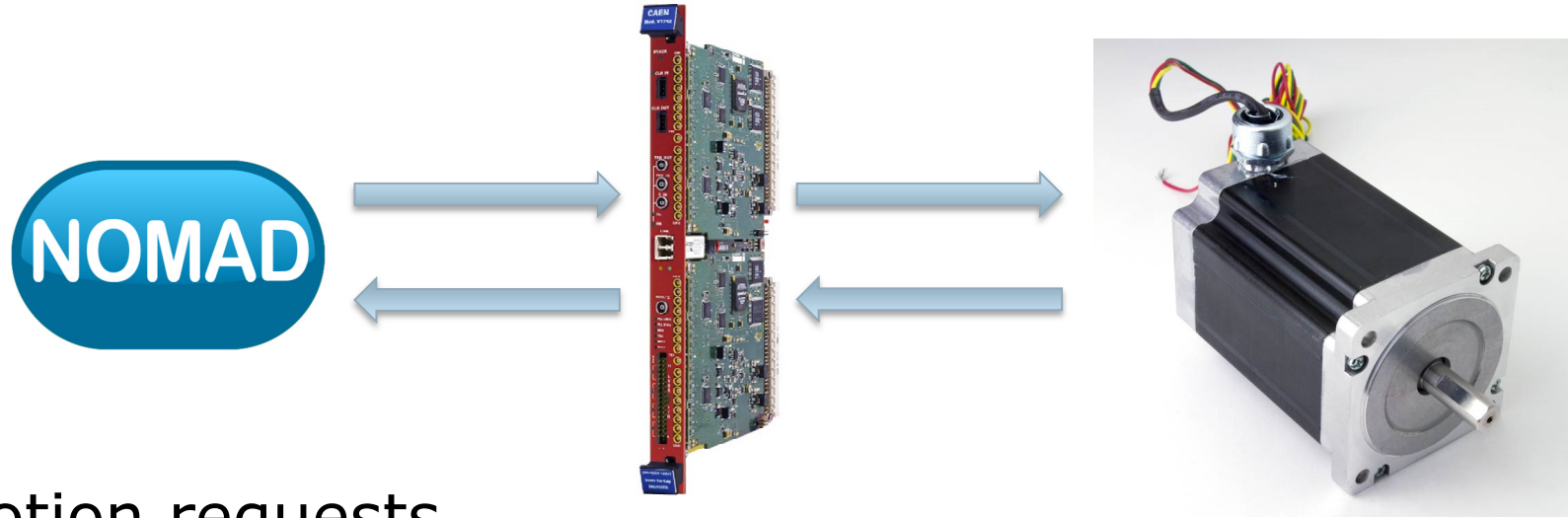


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Nomad 3D



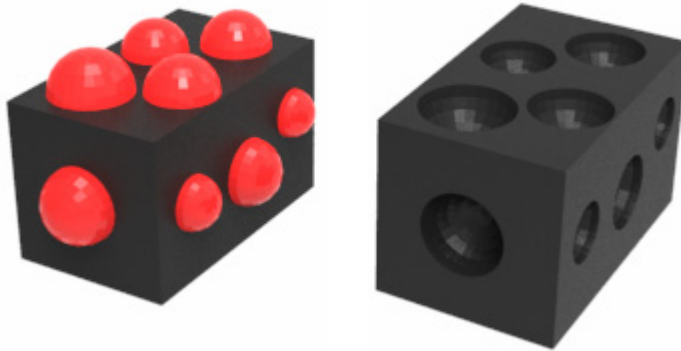
Nomad



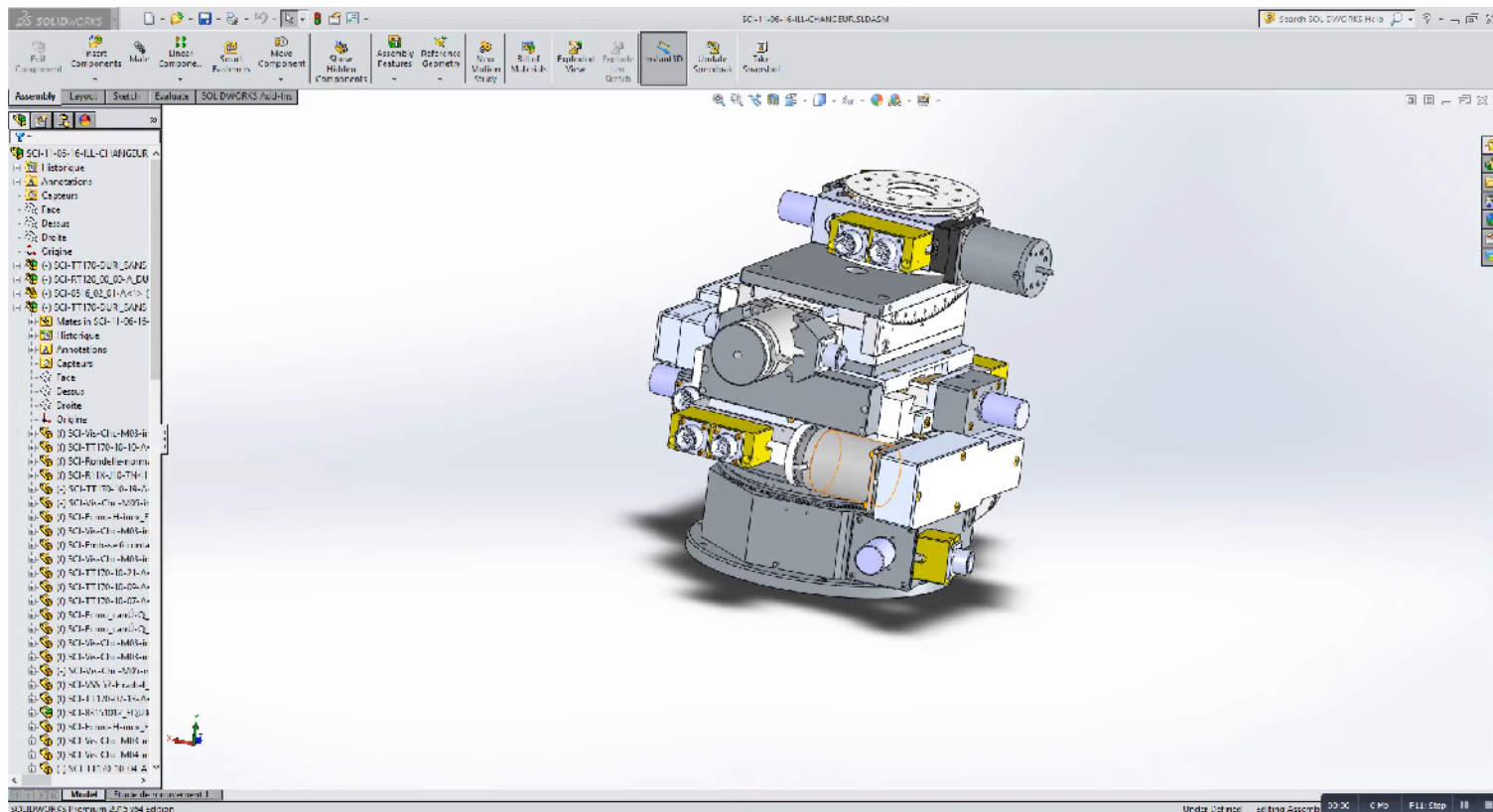
- Motion requests
- Monitoring the encoder positions

SolidWorks

- Computer-Aided Design (CAD)
- Hierarchy of components
- Geometries: combination of basic shapes



SolidWorks



Problem

SolidWorks models are **not adapted**

- Combination of shapes not loadable
- Too big

Informations are **missing**

- Motion characteristics: 3D direction vector
- Walls

Goals of Nomad 3D

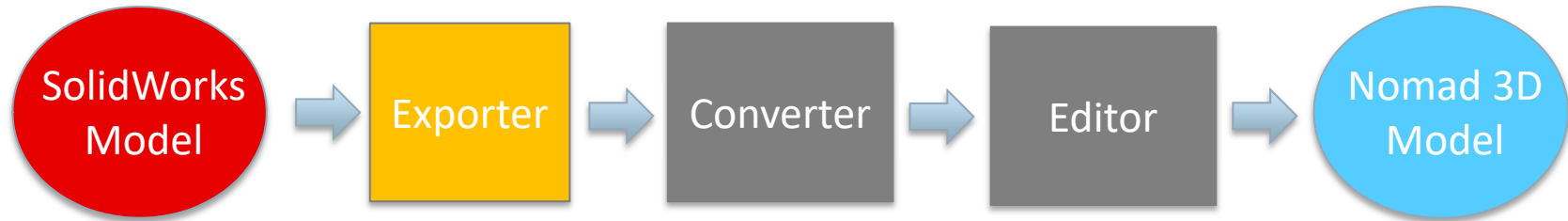
- **Transform** a SolidWorks design into a Nomad 3D model
- **Realtime** display and **animation** of the model according to the **physical** quantities

Workflow

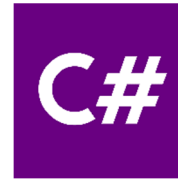


Transform a SolidWorks instrument model

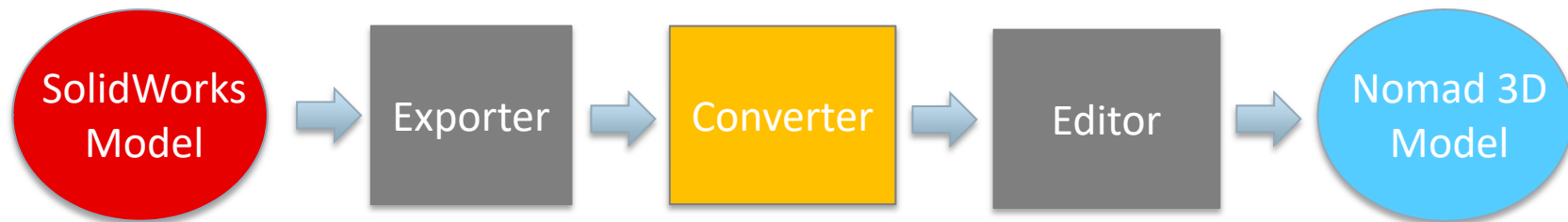
Workflow



- SolidWorks addin
- Triangulation
- Export



Workflow



- Clean-up
- Simplification
- Levels of Details



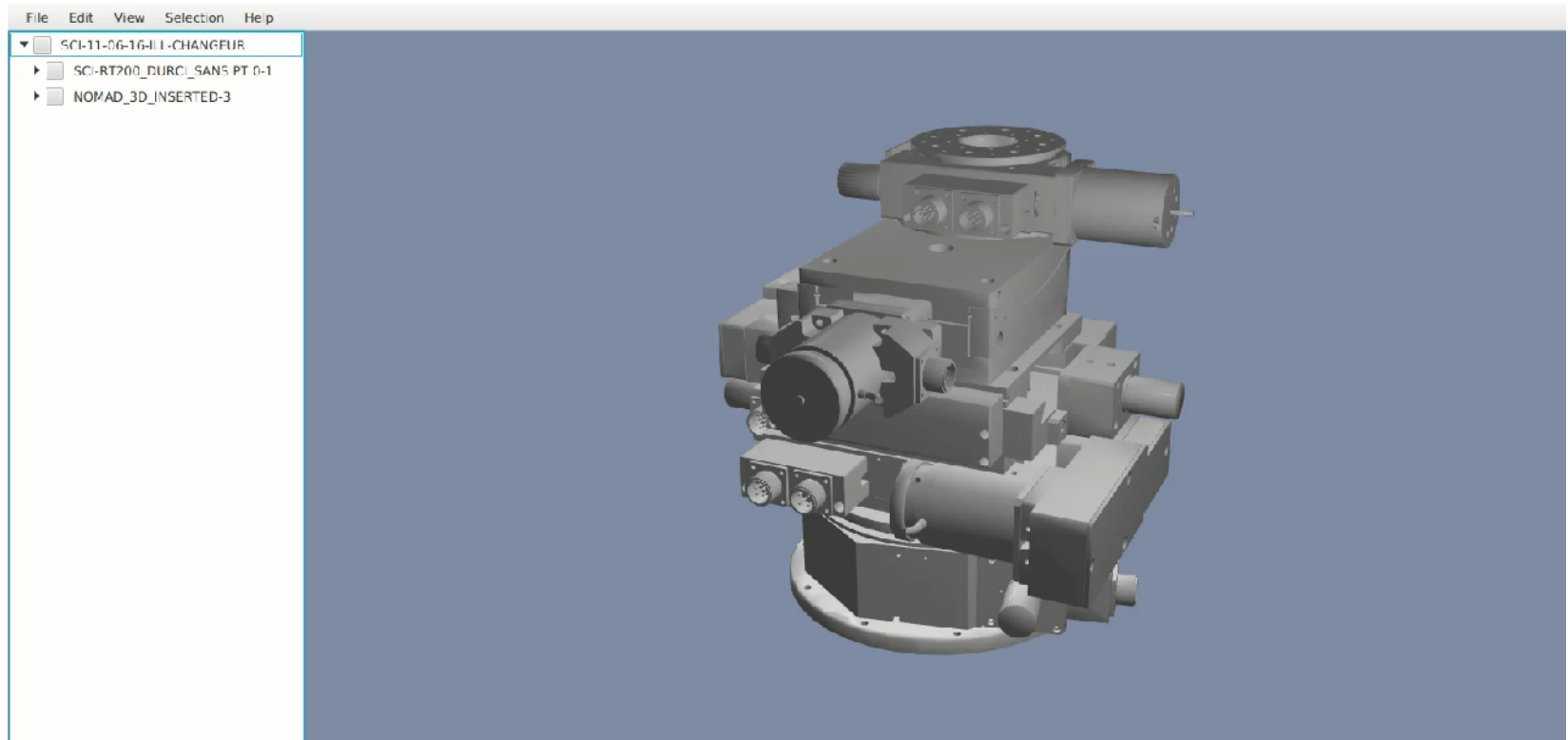
Workflow



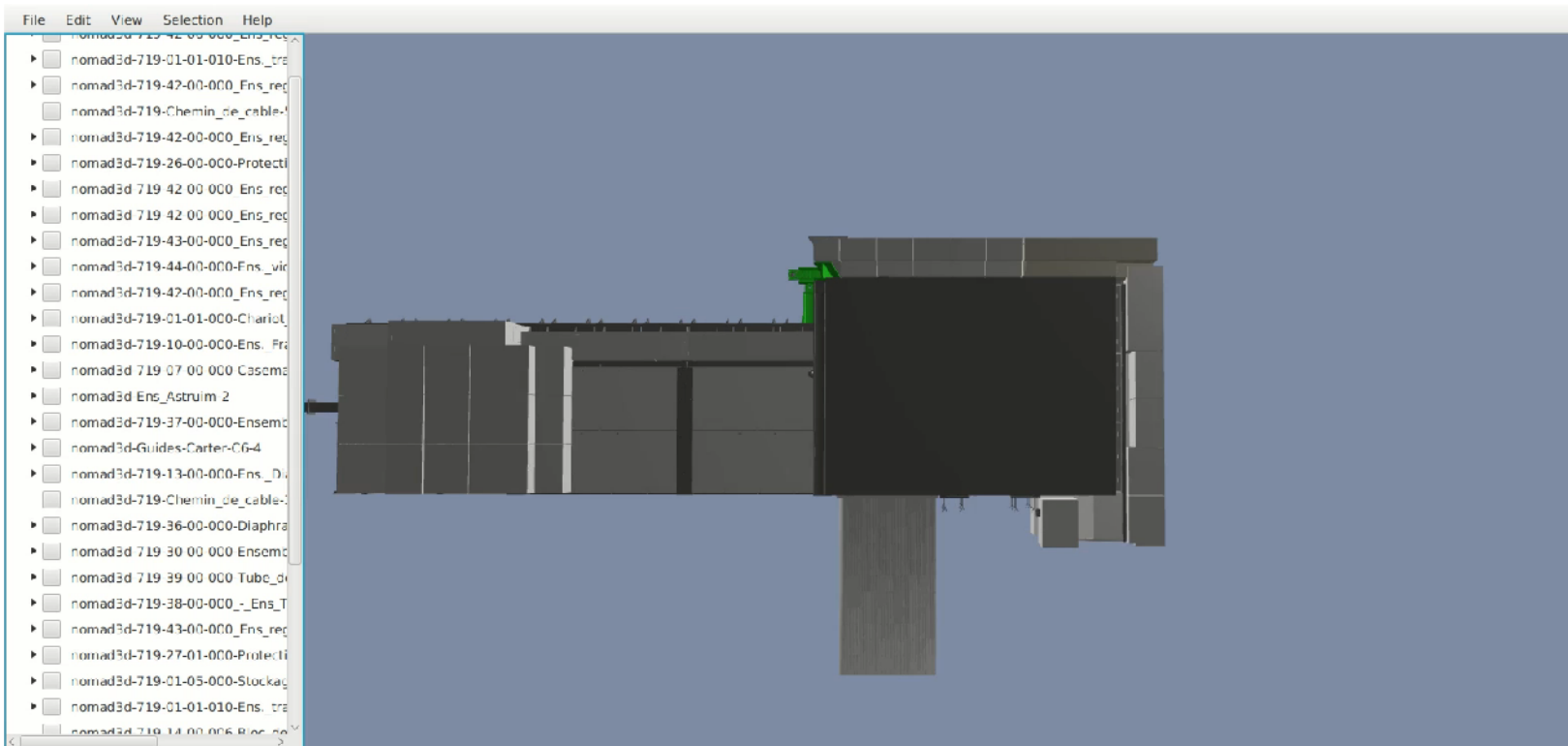
- Enrich the model
- Motion characteristics
- Walls



Workflow – Editor

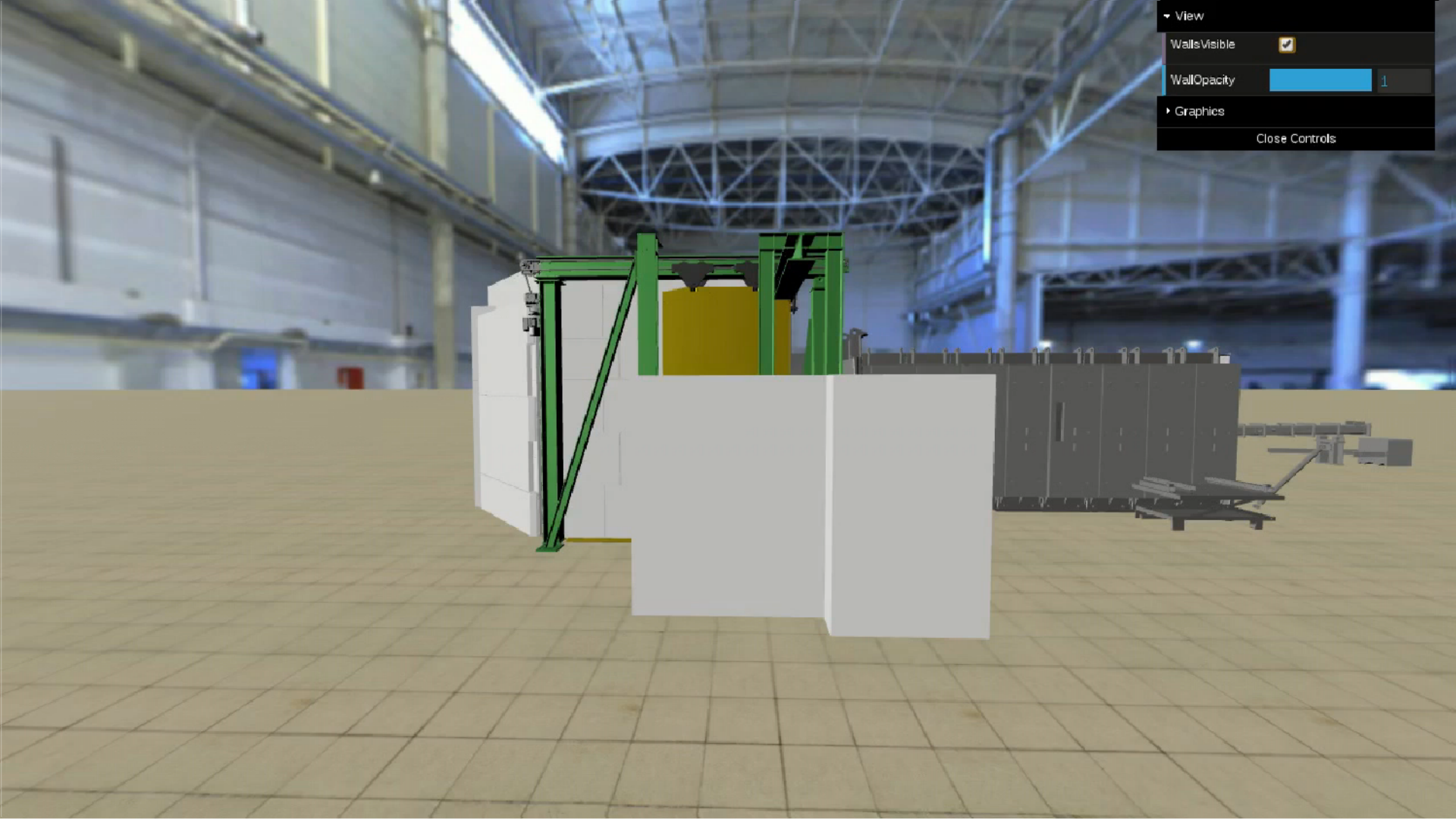


Workflow – Editor



Demonstrations

- Viewer application
- Figaro instrument



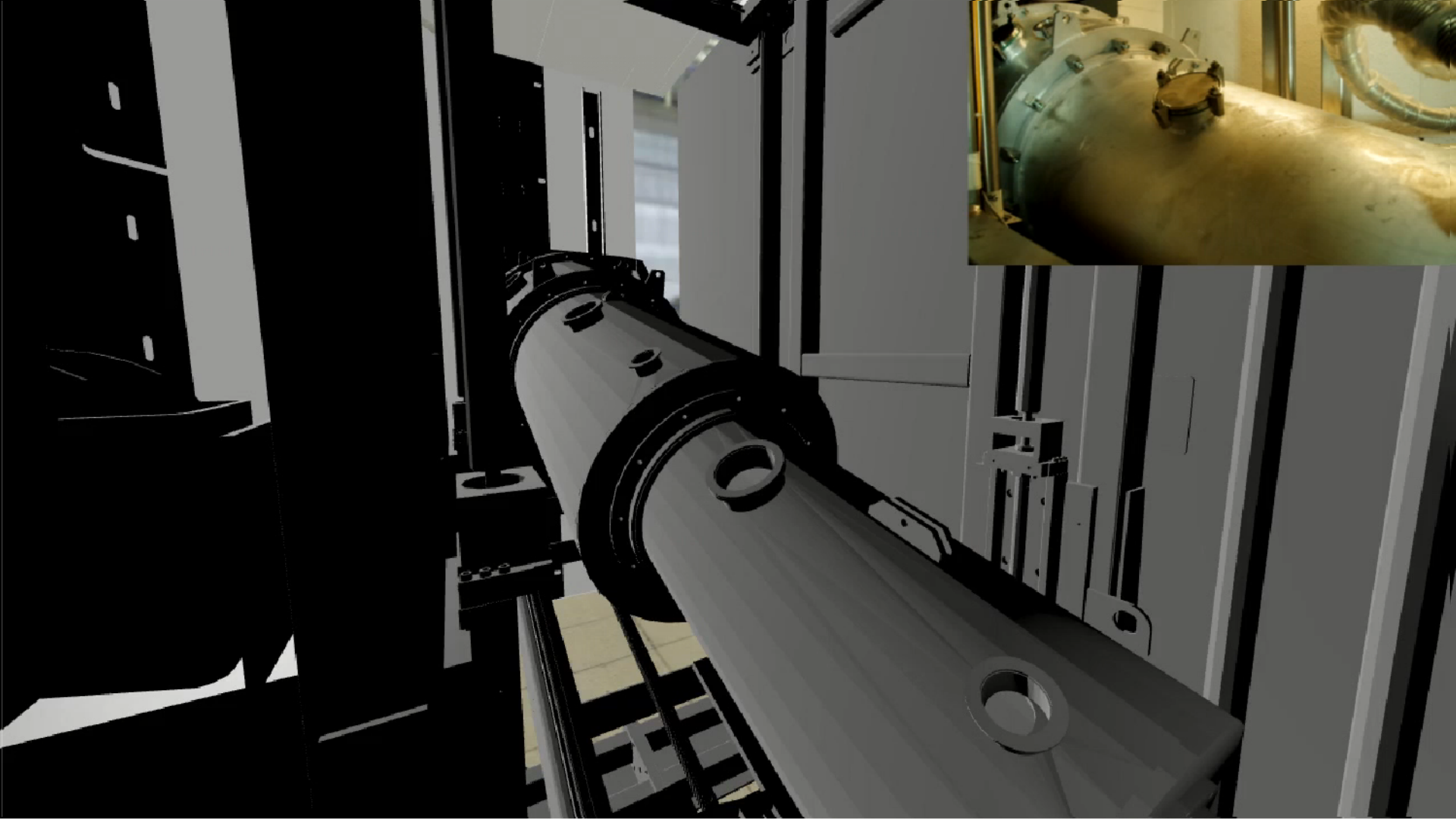
View

WallsVisible☒

WallOpacity1

Graphics

Close Controls



Conclusion

- Figaro

- First instrument fully converted
- Commissioning with users to collect their feedback
- Preparing to the next instrument

- Future developments

- Collision detection
- Moveable objects
- New platforms: web, tablet, AR device

Thank you

Any questions?

Web site: <http://docs.sites.code.ill.fr/nomad-3d/>

Contact: legoc@ill.eu