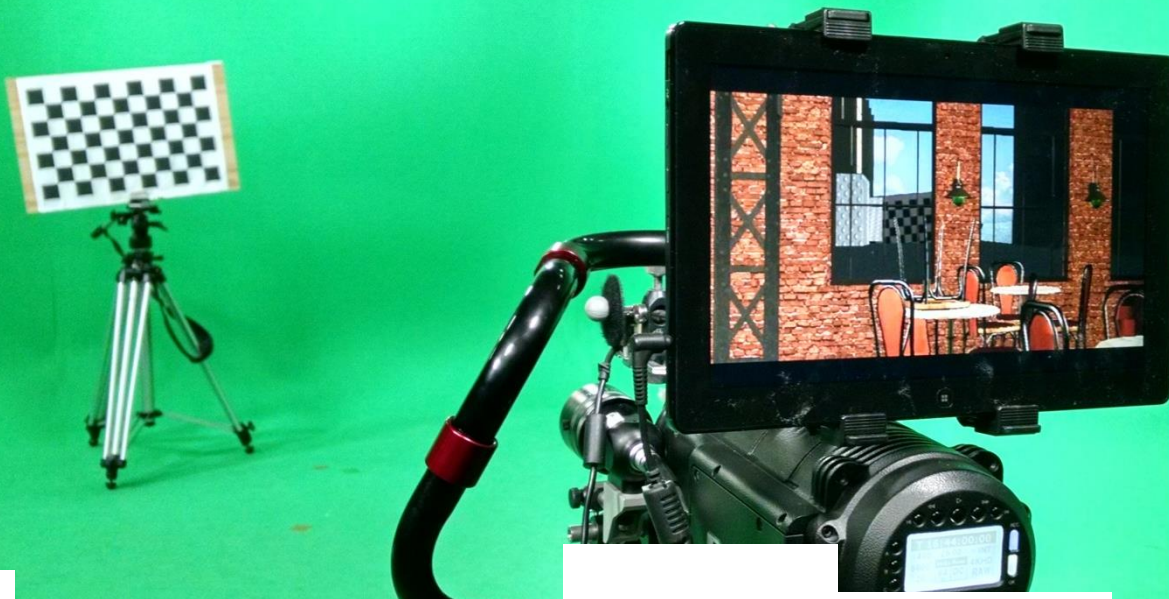


Interactive creation and camera tracking for Previz

Internship presentation | Clément Aymard | 17/09/2014



Contents

- I. Previz
- II. Interactive creation
 - I. Scene modification
 - II. Configuration wizard
- III. Camera tracking
 - I. Calibration for motion capture
 - II. Track-by-view
- IV. Results
- V. Conclusion
- VI. Questions

The Previz Project

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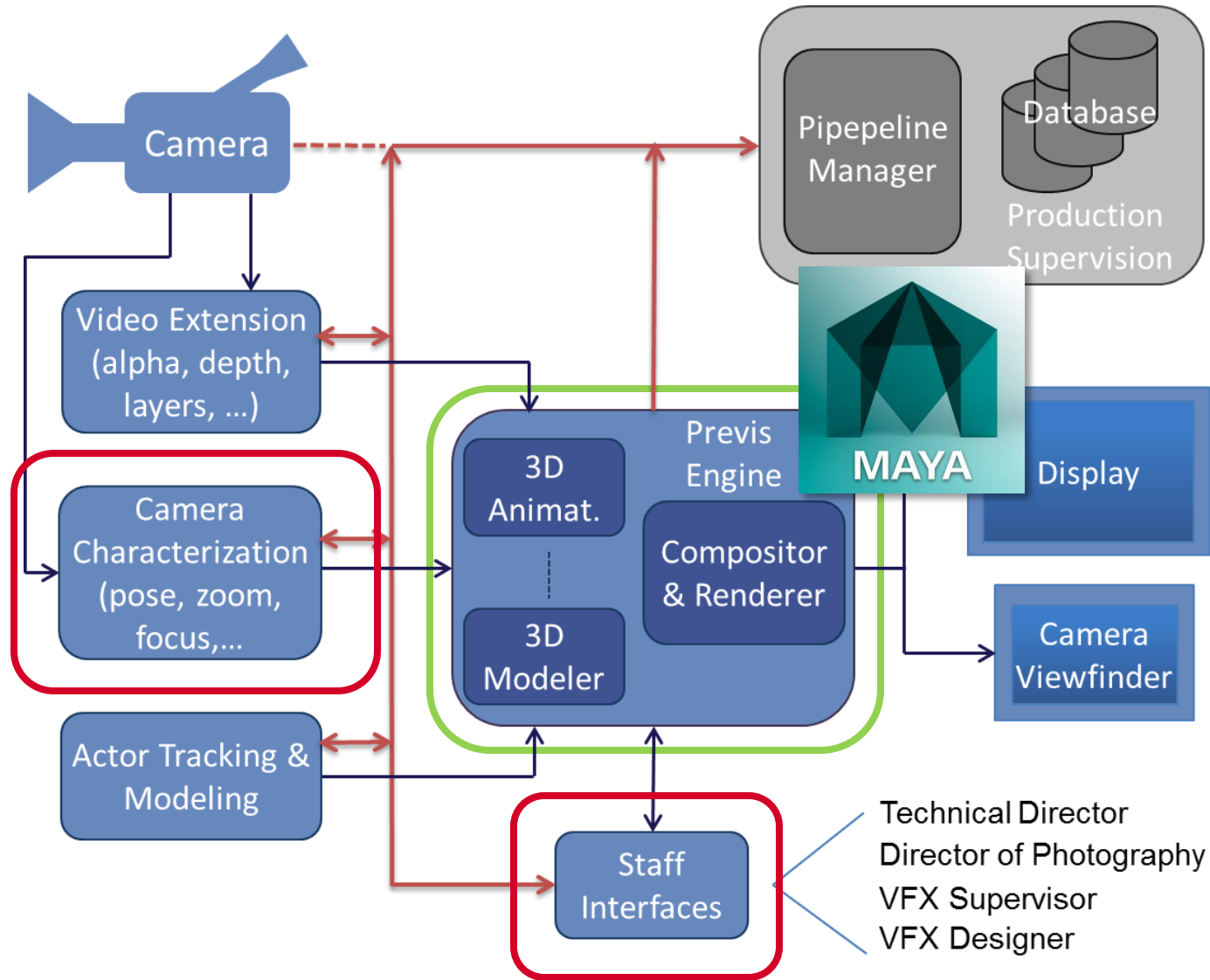


The Previz Project

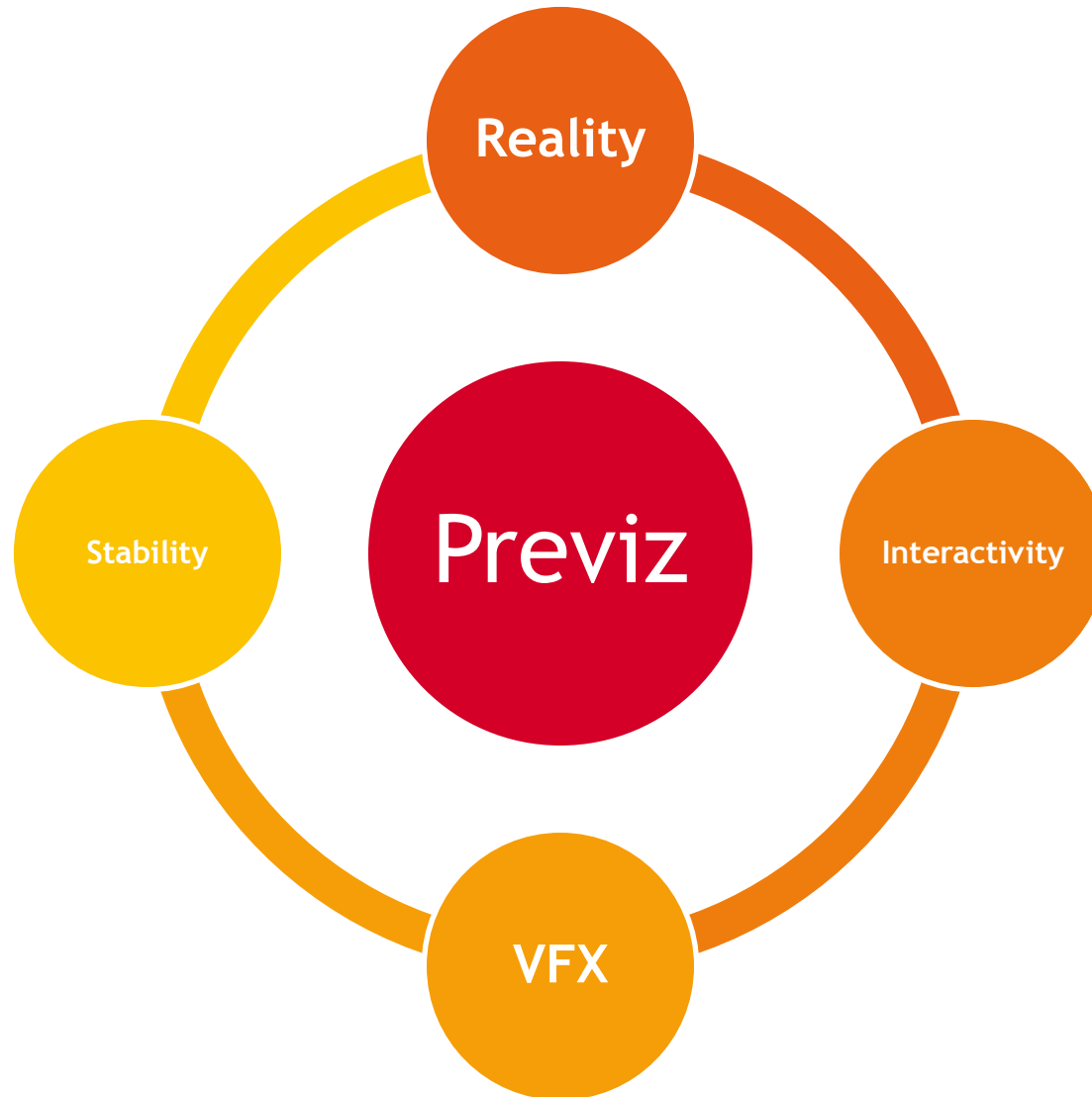
Blend reality and visual effects in real-time during shooting.



The Previz Project



Objectives

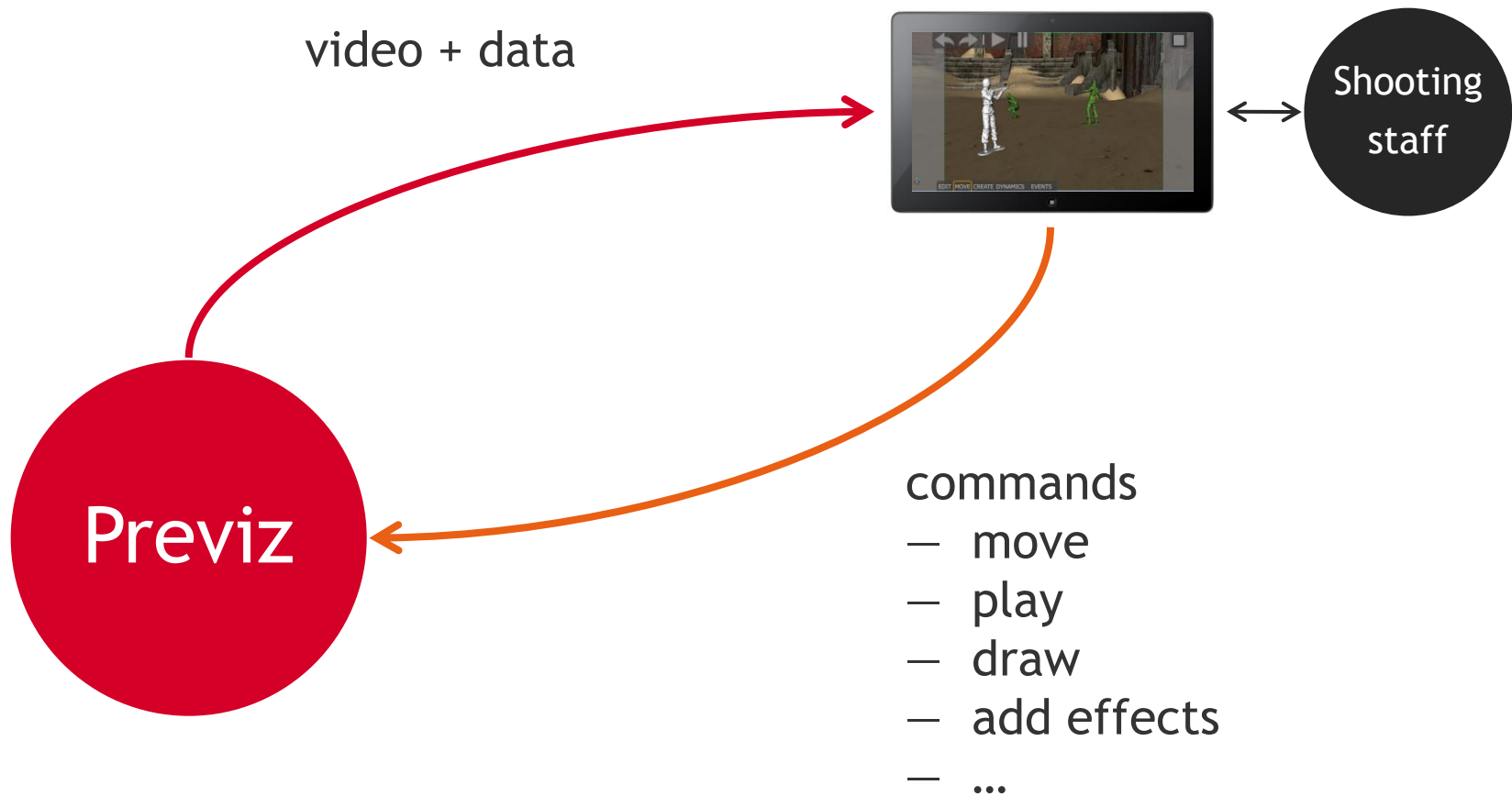


Interactive Creation

Scene modification

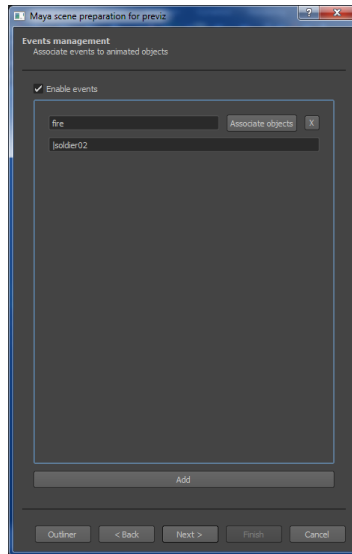


Interaction in Previz

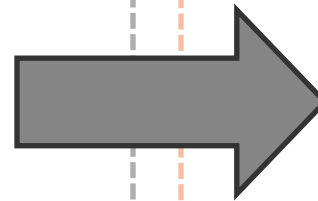


Events

PREPARATION



Register the animation of *soldier02* as an event *fire*



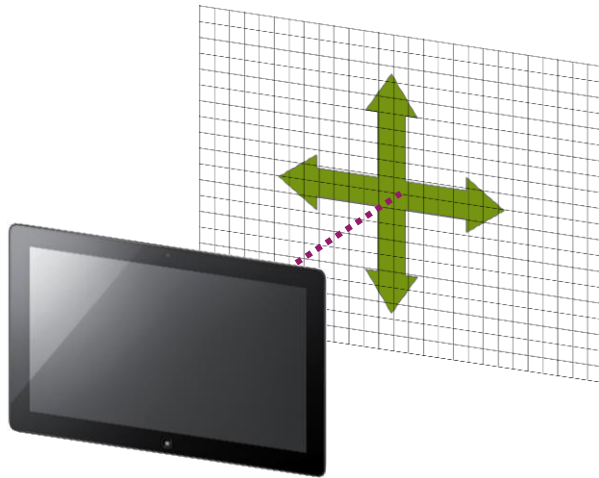
SHOOTING



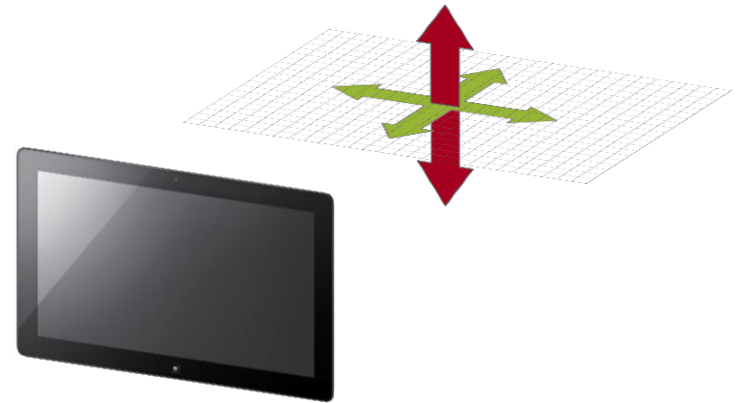
Shooting staff

Event *fire* can be triggered at any time during the shooting

Displacement



- Plan parallel to the tablet
- Distance tablet/plan fixed



- Horizontal plan attached to object
- Vertical vector attached to object

Interactive Creation

Configuration wizard

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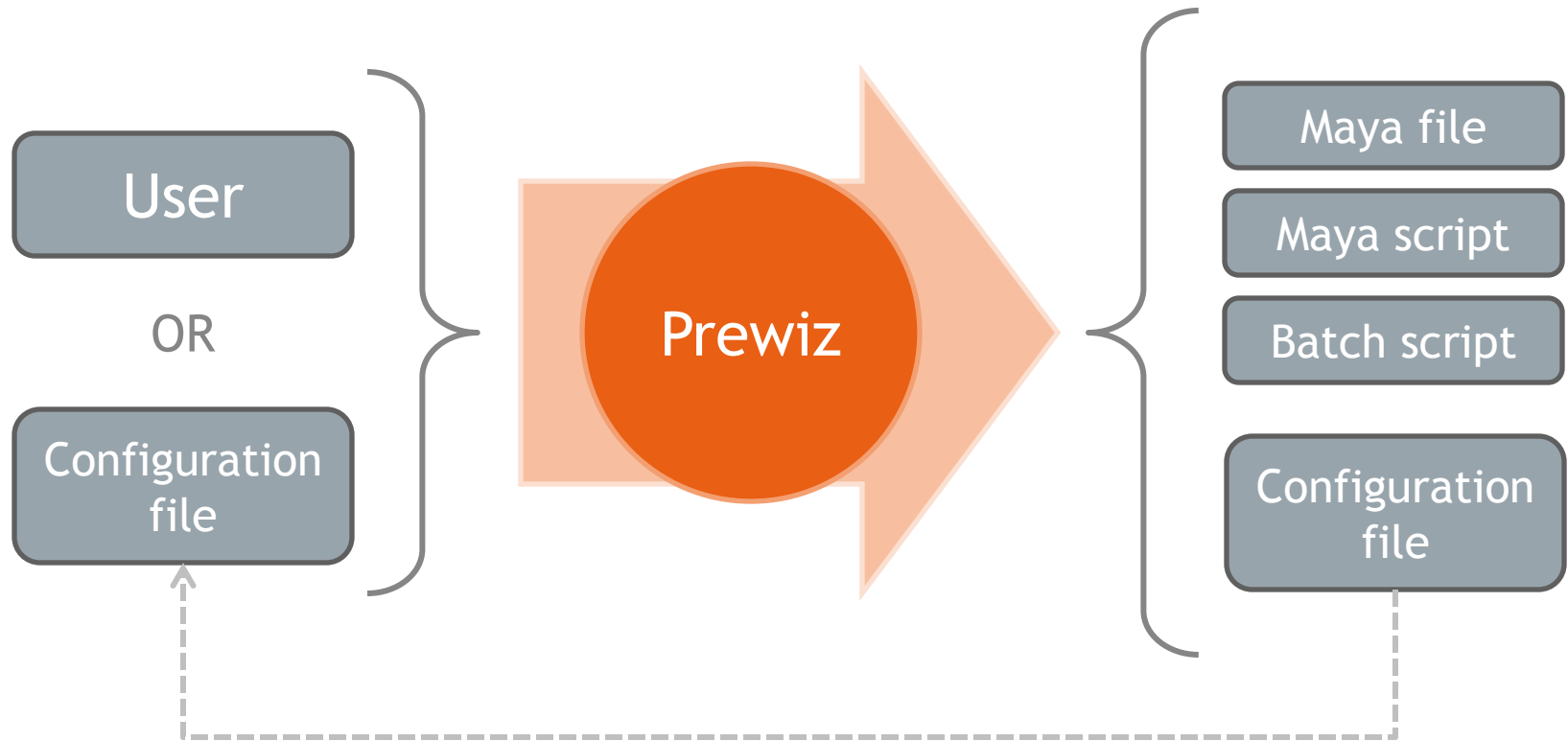


Scene configuration

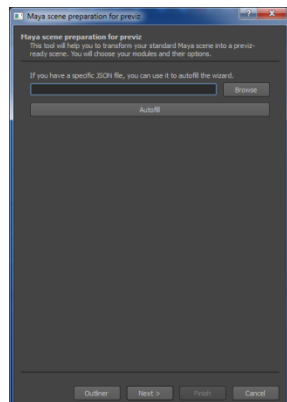
Configure a classic scene in a Previz-ready scene.

- Motion capture
- Events
- DMX (light linking)
- Virtual camera
- Compositing
- Activation

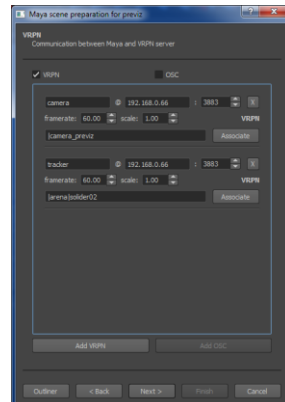
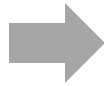
Scene configuration - wizard



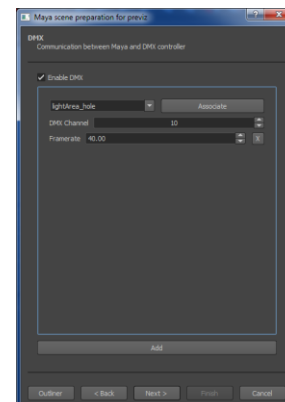
Scene configuration - usage



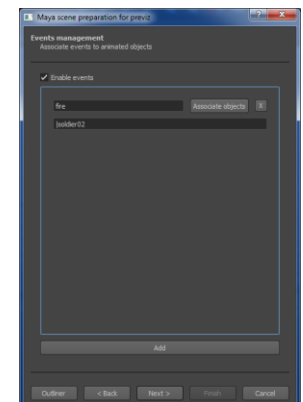
Start Configuration file



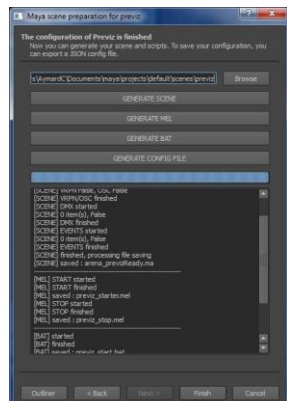
Tracking



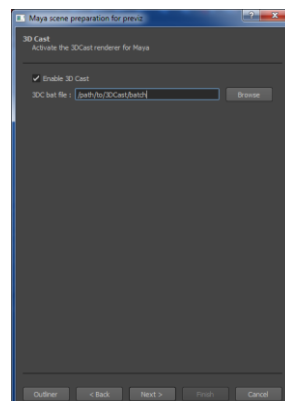
DMX



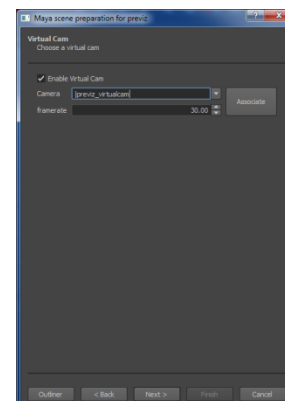
Events



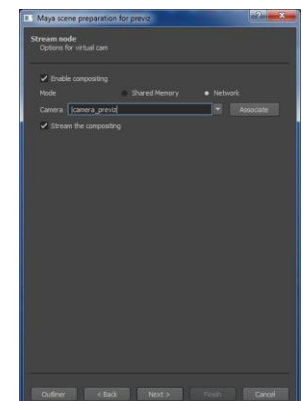
Generation



Renderer



Tablet



Compositing



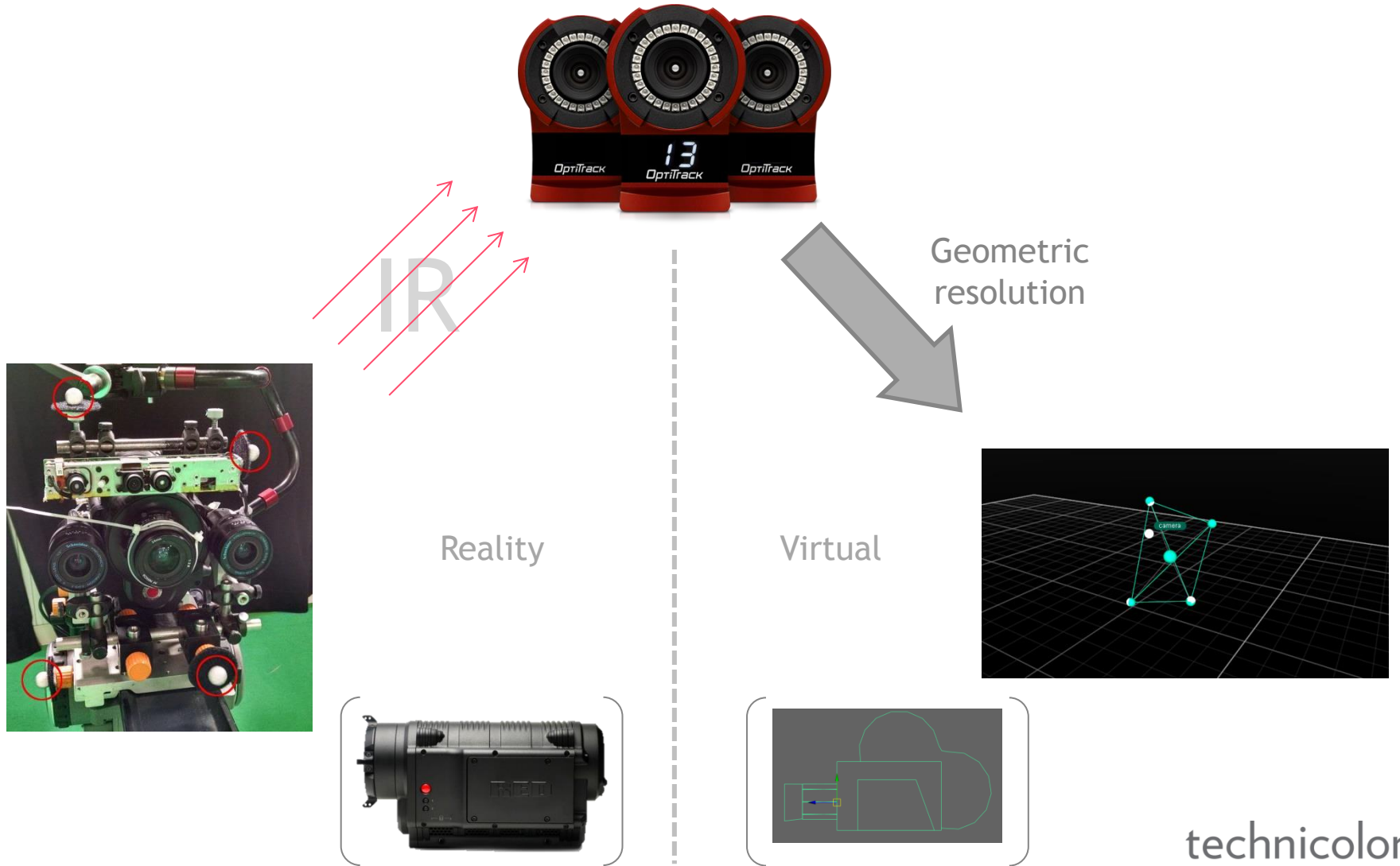
Camera tracking

Motion capture

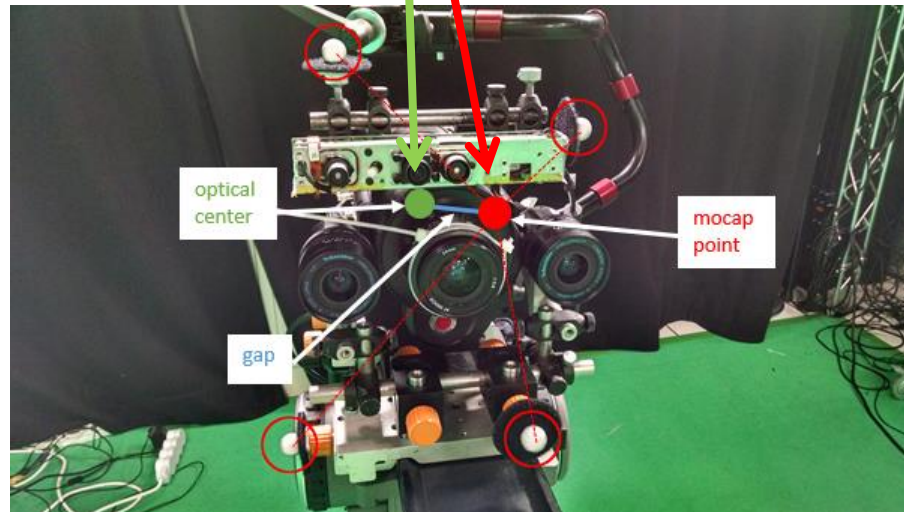
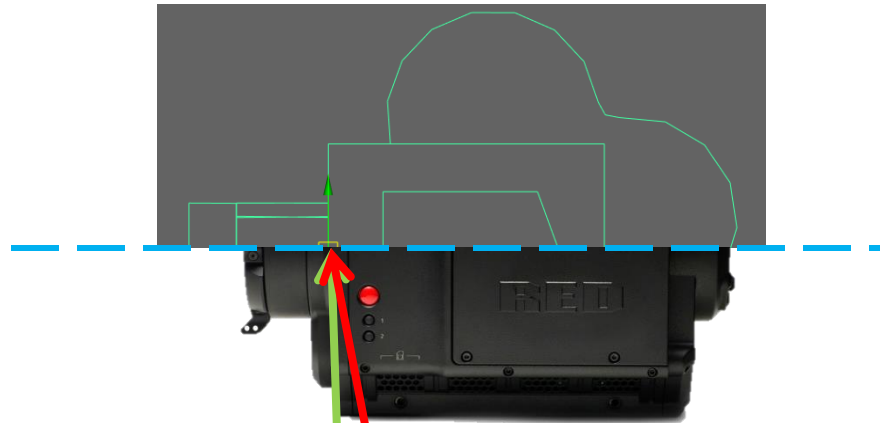
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Motion capture



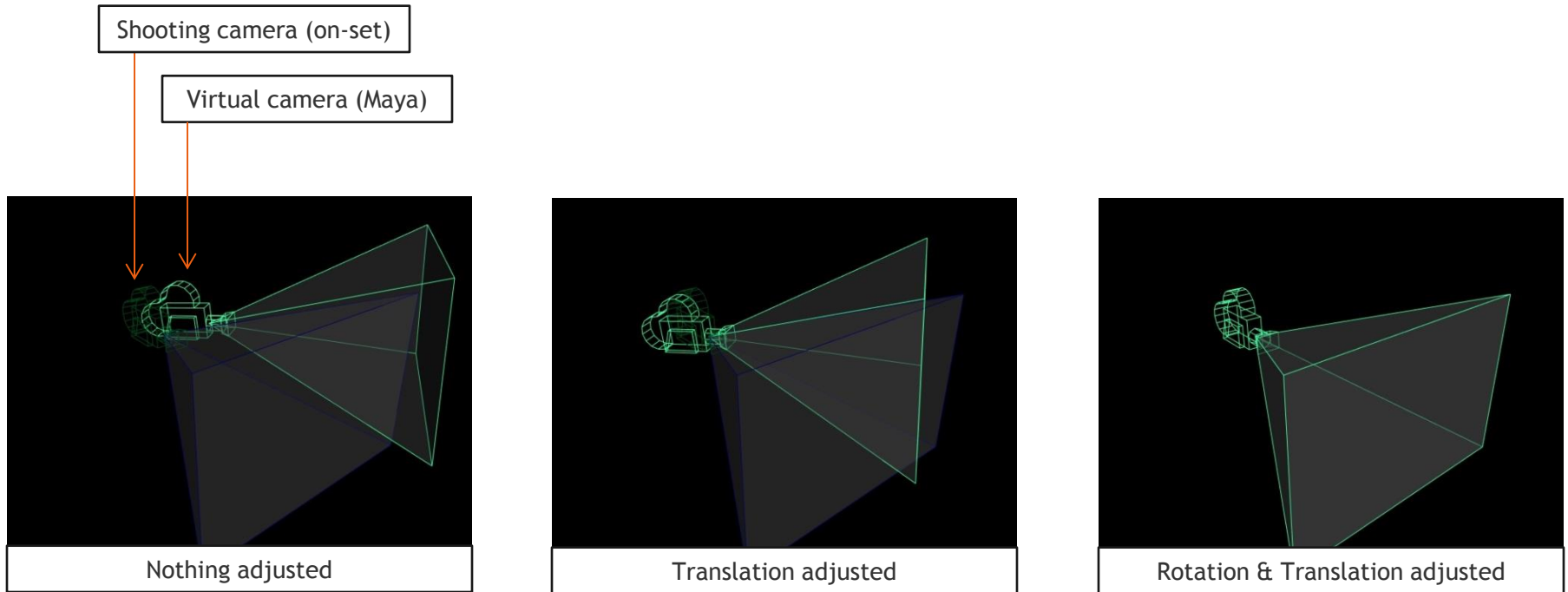
Motion capture - problematic



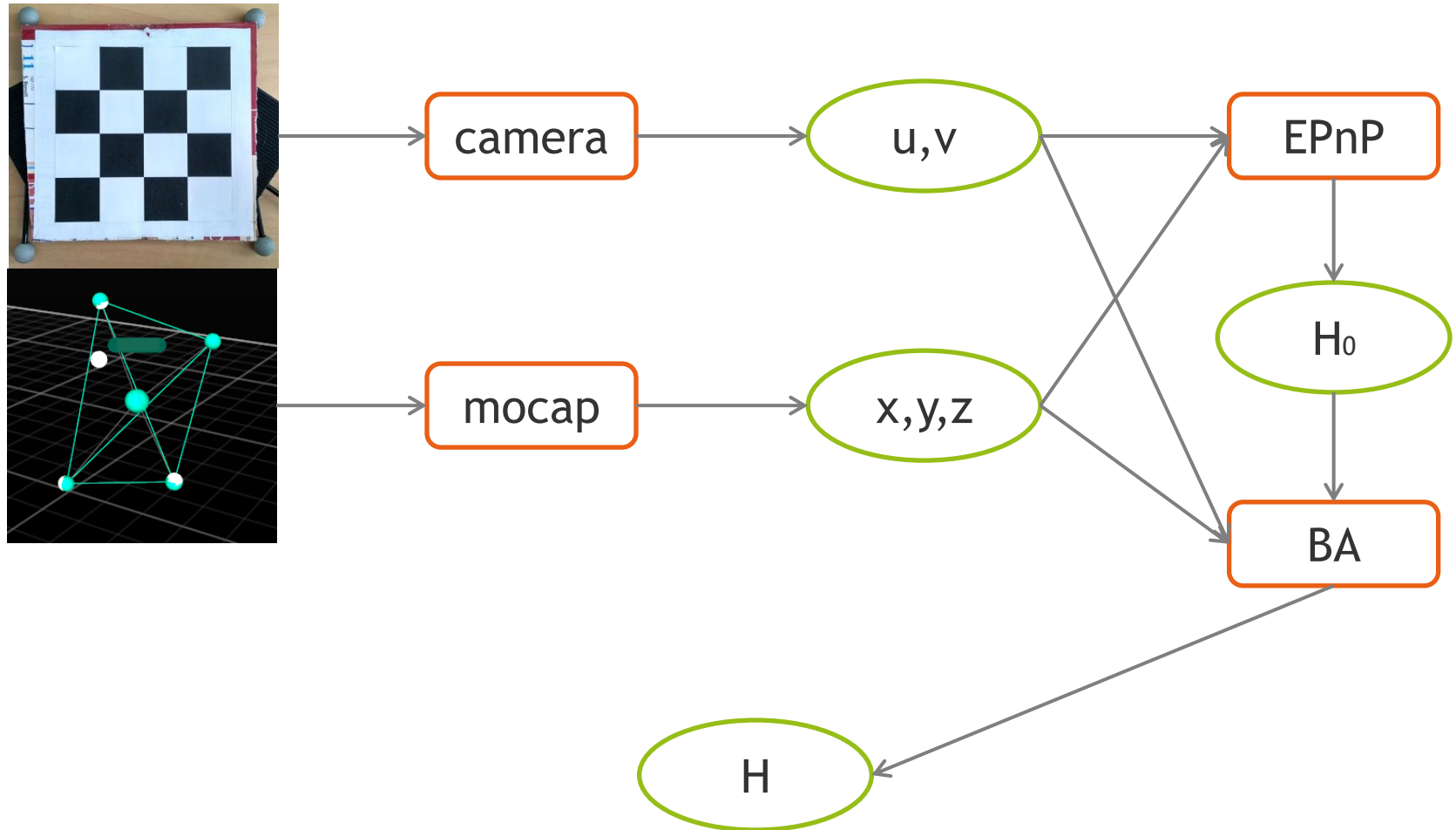
Camera tracking



Motion capture - problematic



Motion capture - calibration



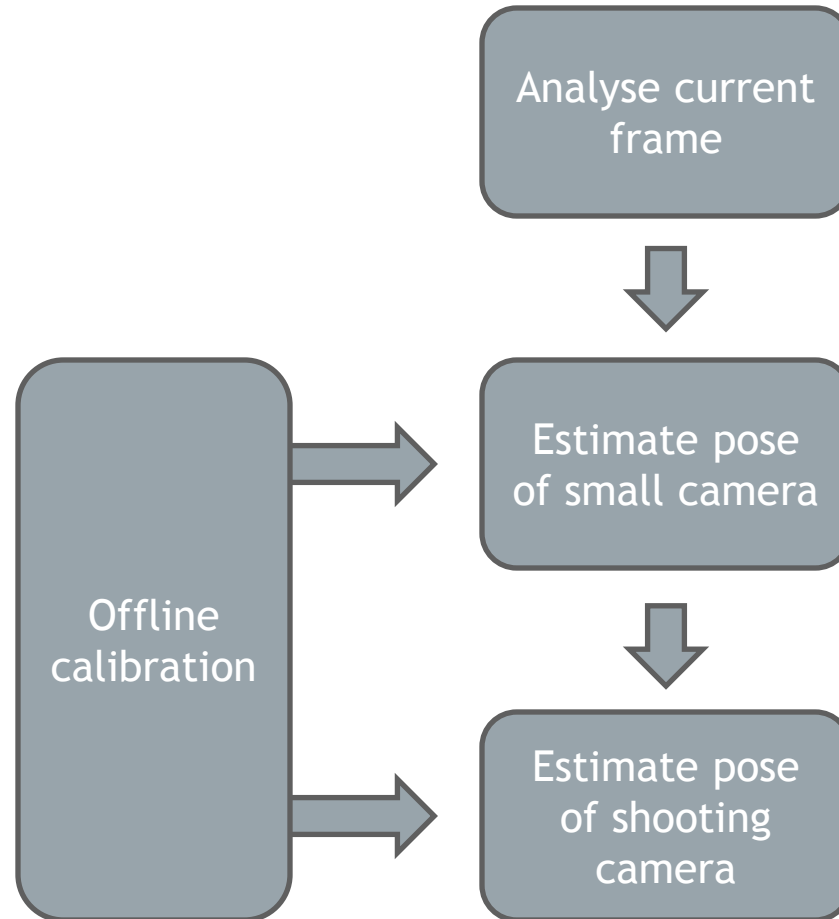
Camera tracking

Video-based

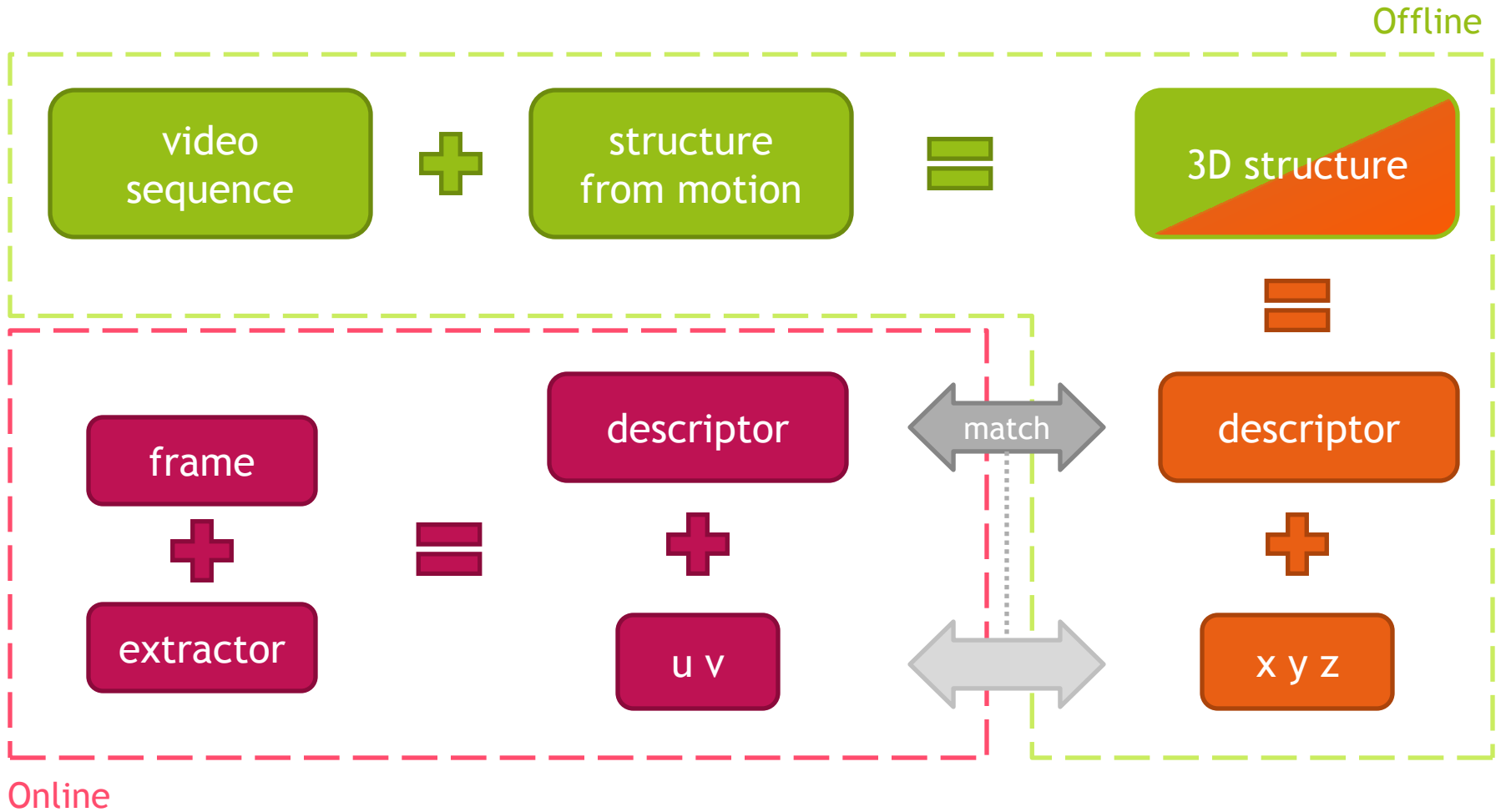
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Video-based - Concept

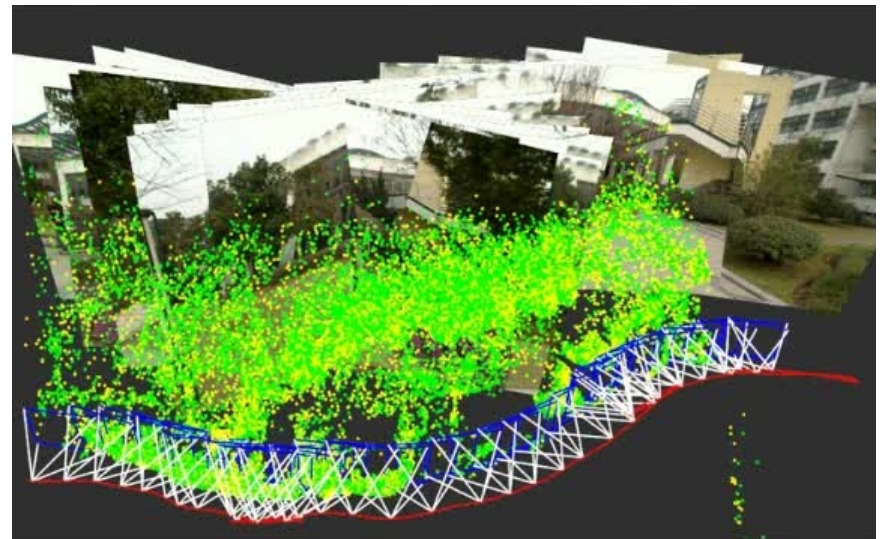
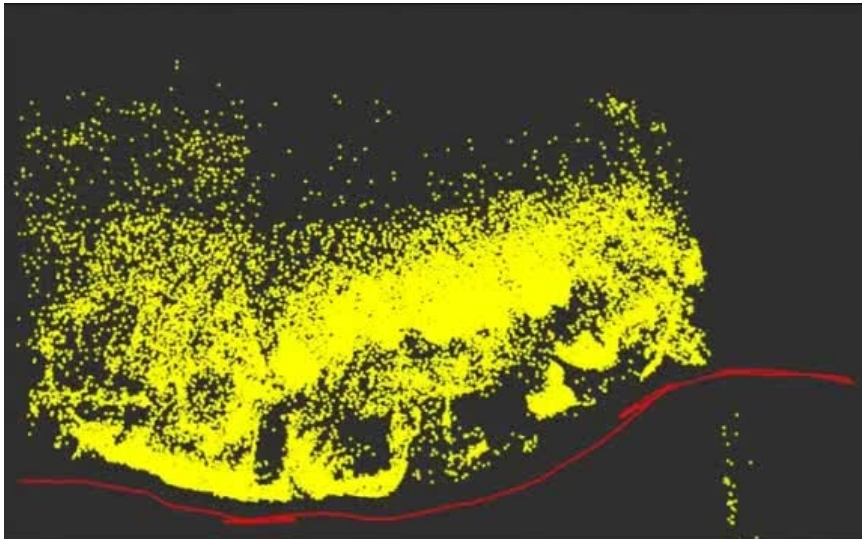


Video-based - SfM and detectors



Video-based - keyframes

Aim : minimize {
number of unclassified points
number of surclassified points



Zilong Dong, Guofeng Zhang, Jiaya Jia, and Hujun Bao. *Keyframe-based real-time camera tracking*. 2009.

Results and improvements propositions

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Results - Creative interaction

Improve the movements

- Natural movements
- Gain in precision

Events triggering

- Workable for one event per object
- Reset / replay feature
- Video

Wizard

- Generate a Previz-ready scene is now easy and quick
- Very modulable, easy to adapt to Previz changes

Improvements - Creative interaction

Improve the movements

- Add rotation and scale control

Events

- Timeline system

Wizard

- Improved graphic interface
- Allow Previz scene editing

Results - Camera tracking

Calibration for motion capture

- Only translation
- Rotation easily findable

Video-based tracking

- No tests, just research
- Keyframes classification : paper announces 20fps with a 4-core PC and 640*480 resolution

Improvements - Camera tracking

Calibration for motion capture

- Add rotation resolution
- Include the calibration in the configuration wizard

Video-based tracking

- A studio = green screen = few points of interest
- Fiducial markers for robustness

Conclusion

Self-enrichment

- Maya
- Professionnal equipement
- Real-condition shooting in Paris
- API learning (Maya, OptiTrack, OpenCV, PyQt)

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- Innovation context
- Cinema

Videos

Questions

