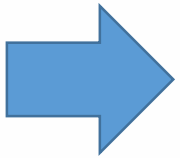
i4D Preproduction System

Cutting Edge Storyboard Design - Fast, Visual & Technical

i4D Preproduction System (i4D-PS)

In film production: time is money & resource is money



Prolonged shooting days: waste of money and resources

Solution: previsualization - computer aided simulation and planning of film production

1. assist and inspire creativity of filmmakers by visual features and instant showcasing
2. derive precise parameters for filmmaking – virtual placement of actors, cameras and stage props

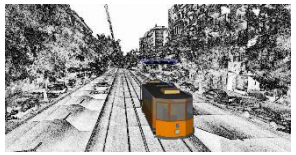
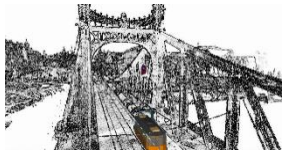
Virtual moviemaking system

Screenplay

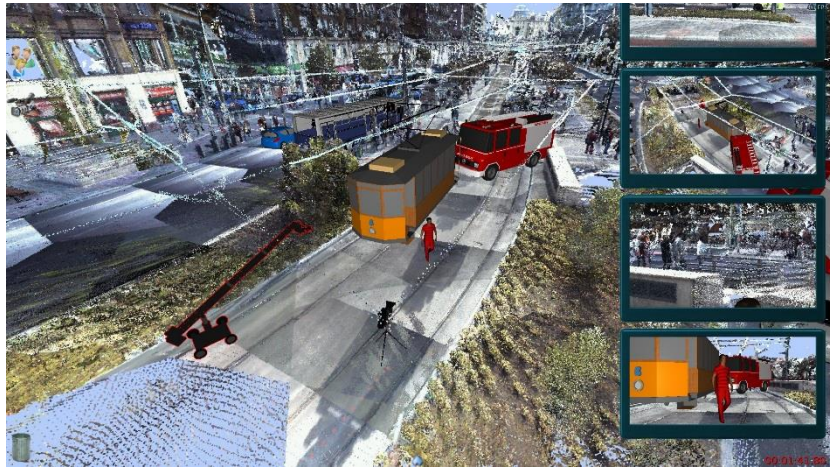
EXT.Bartók Béla Street – Kiskörút– Deák tér.DAY

1. ACTION: Due to stray current, a tram runs away without control.
2. ACTION : A blue car appears from the right and attempts to chase the tram, which continues to accelerate.
3. ACTION : The rush continues. Two other cars wait at a crossroad, but they miss to stop the tram.
4. ACTION : A Bus and a Fire engine close the way in the rail, but the fast approaching tram easily pushes them away. The tram continues the rush and turns onto the bridge

Storyboard

i4D-PS



Technical storyboard of the shooting day

Accurate technical data: timing, position, camera parameters etc.

Virtual moviemaking system

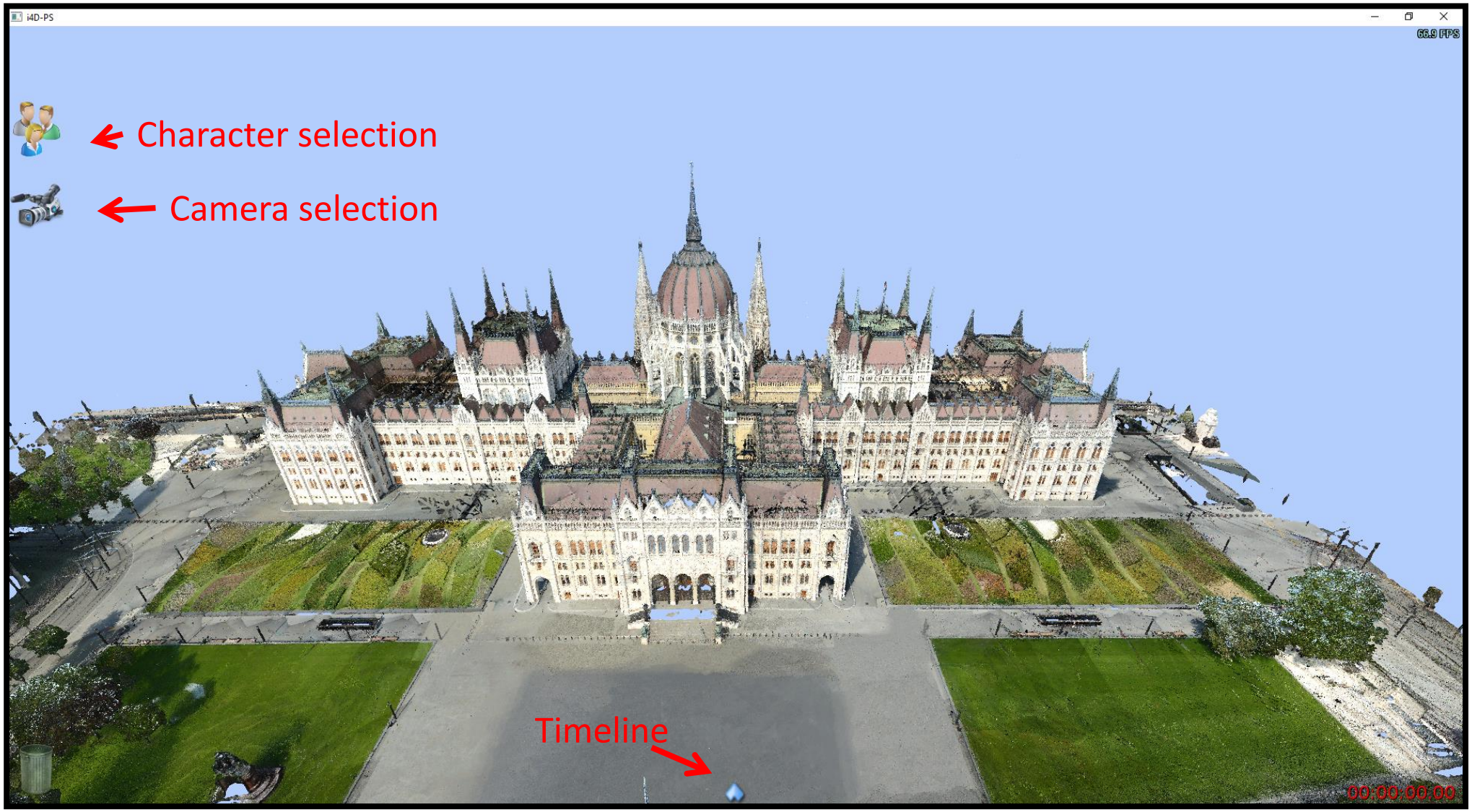
We provide:

- Scene capture and pre-processing (1-2 days)
- Model library
- Virtual moviemaking system

On the production side:

- Dynamic scene planning (simple drag and drop)
- Camera positioning (simple drag and drop)
- Camera control and timing (camera simulator)
- Scene preview and technical data export

i4D-PS MVP: Drawing board



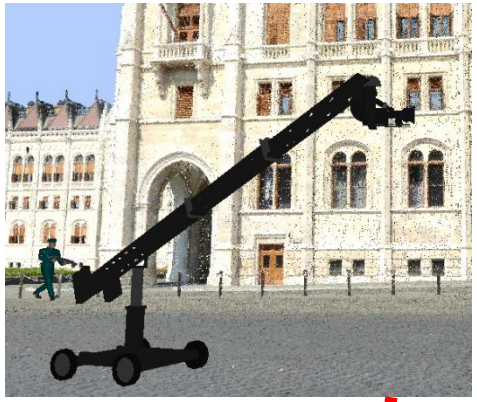
Pointcloud scan: Budapest Közút Zrt.

Character selection

Camera selection

Three camera types with various optics

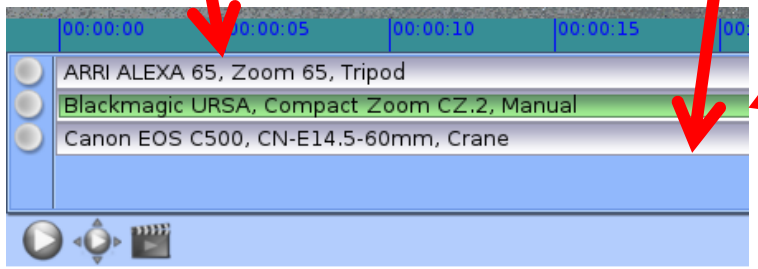
Tripod camera
svenk

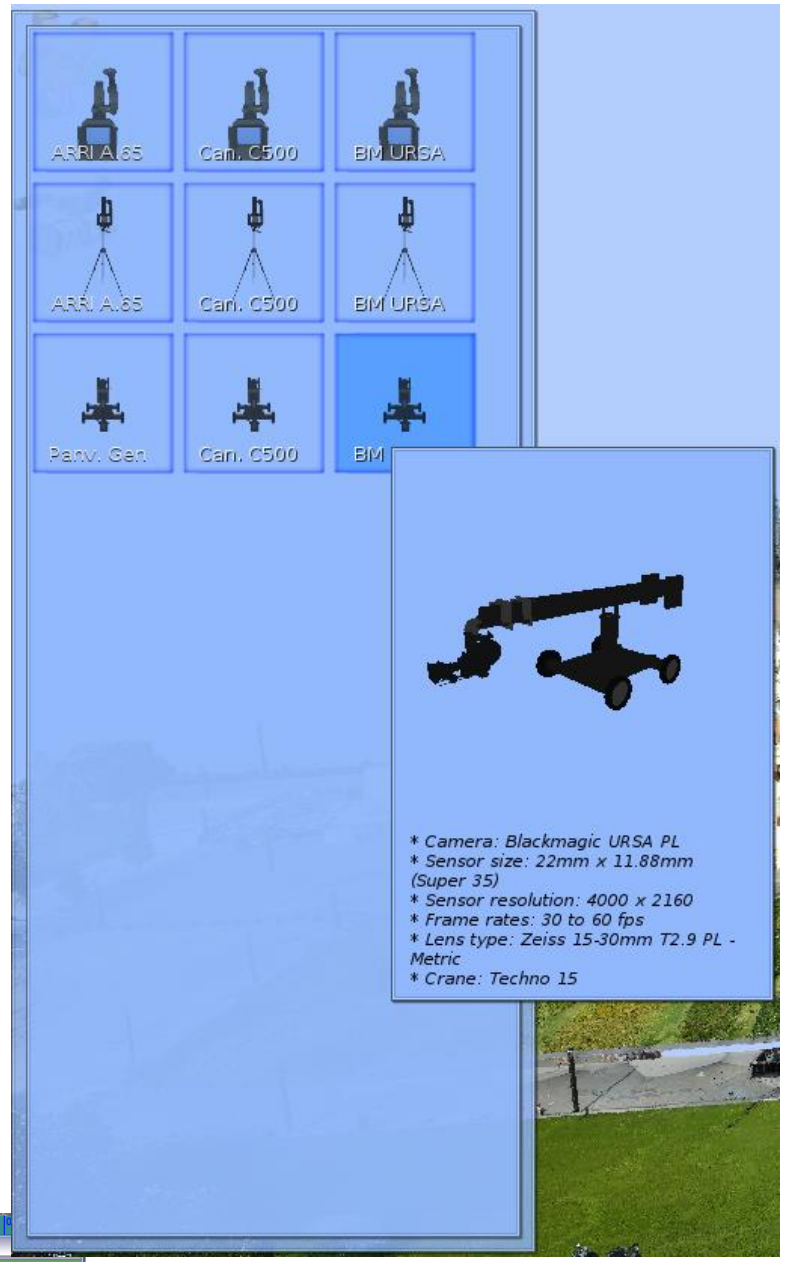


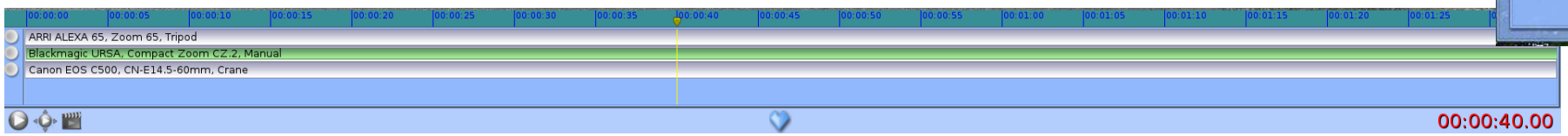
TechnoCrane 15

Free camera: everyting else

- Free movement,
- Drone,
- *Fahrt*







Screenplay example

FADE IN

EXT.Bartók Béla Street – Kiskörút– Deák tér.DAY

1. ACTION: Due to stray current, a tram runs away without control.
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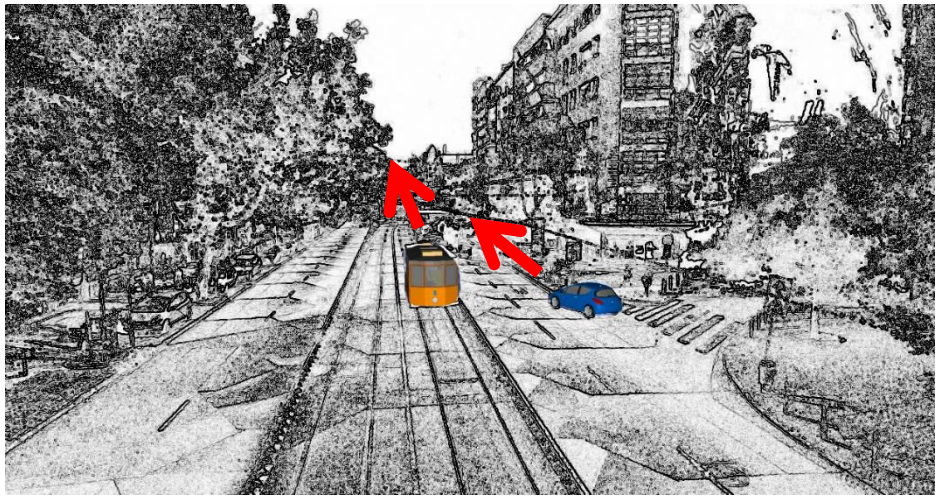
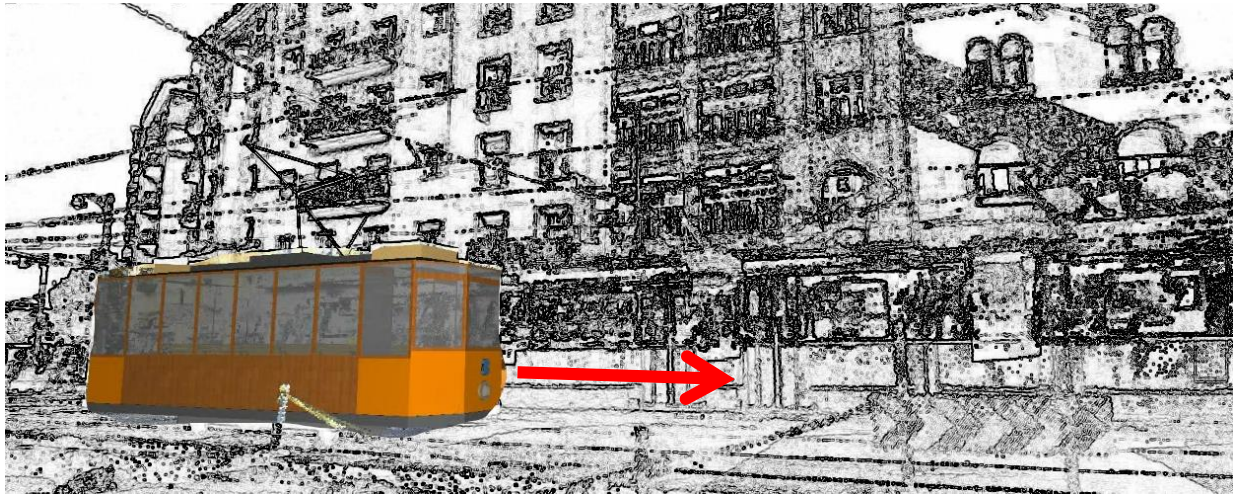
3. ACTION : The rush continues. Two other cars wait at a crossroad, but they miss to stop the tram.
4. ACTION : A Bus and a Fire engine close the way in the rail, but the fast approaching tram easily pushes them away. The tram continues the rush and turns onto the bridge
5. ACTION: Superman jumps down from the top of the bridge trying to stop the tram, but he misses it.
6. ACTION: Local hero arrives on the top of an oncoming tram an jumps onto the unleashed vehicle, which crashes another roadblock
7. ACTION: Local hero crawls into the cab and stops the tram in the very last moment. Late arriving Batman can only notice that every problem has been already solved.

FADE OUT

2D storyboard

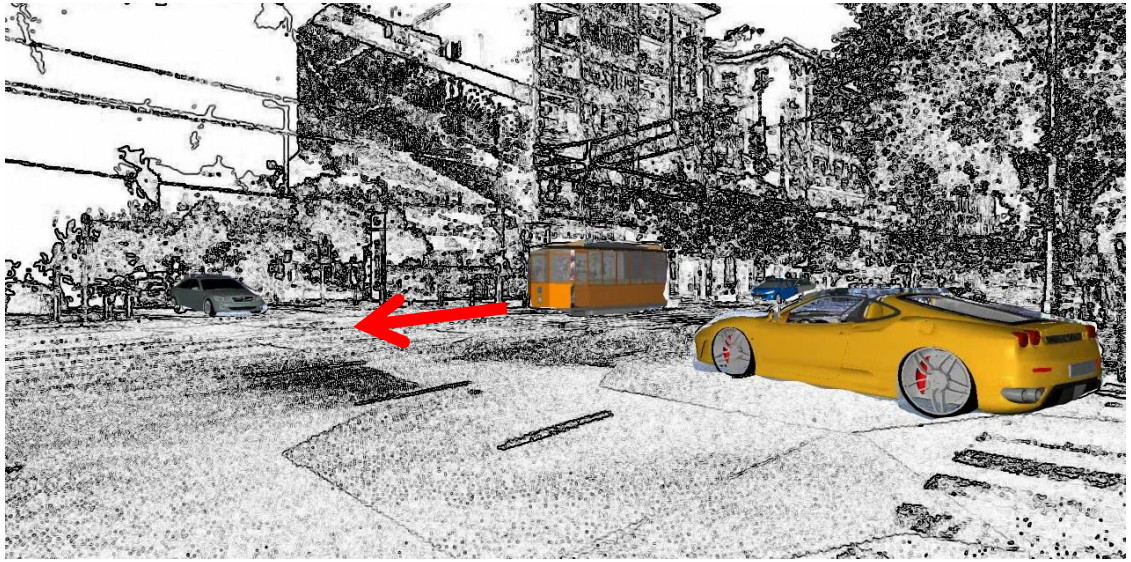
- Due to stray current, a tram runs away without control. A blue car appears from the right and attempts to chase the tram, which continues to accelerate.





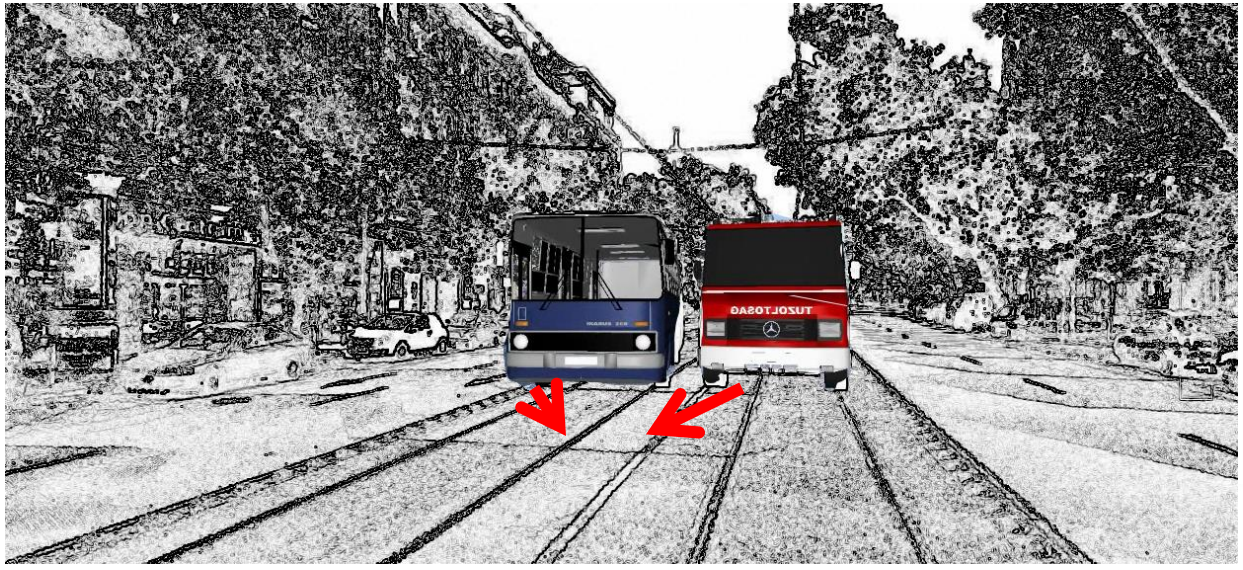
2D storyboard

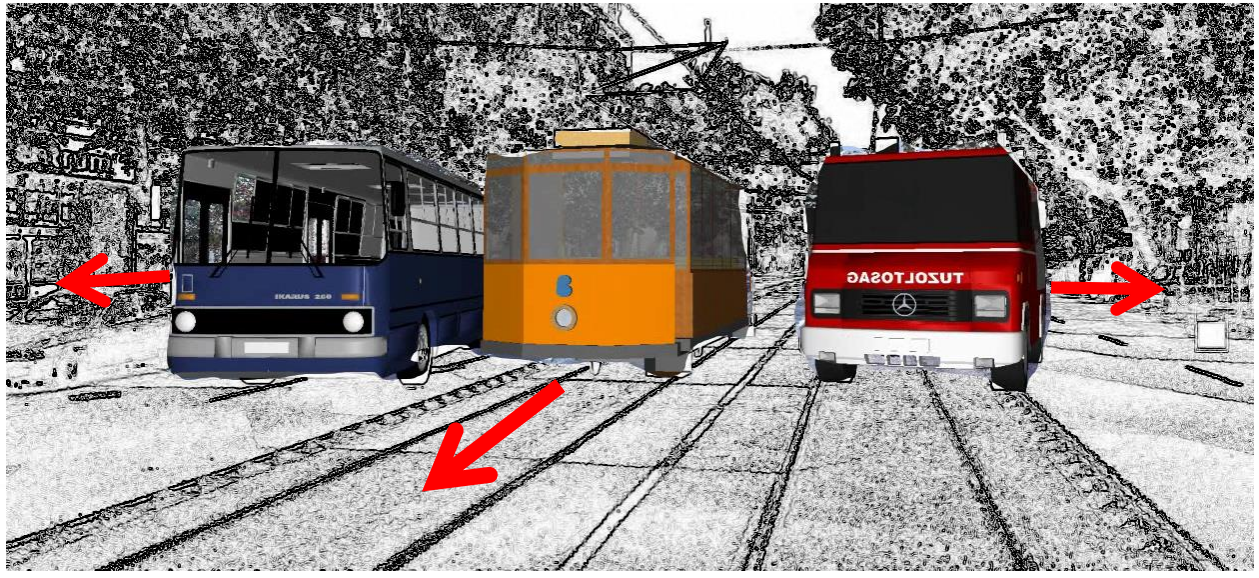
- The rush continues. Two other cars wait at a crossroad, but they miss to stop the tram.

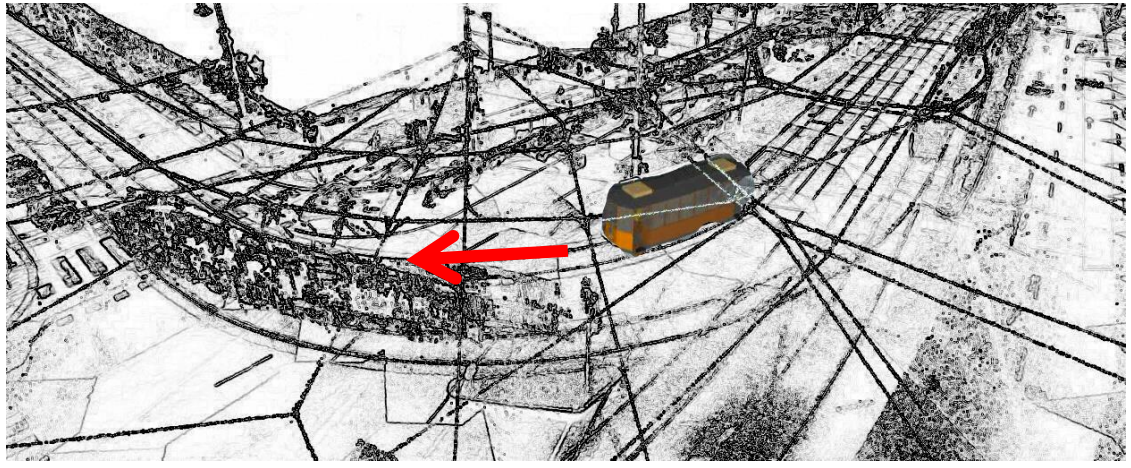


2D storyboard

- A Bus and a Fire engine close the way in the rail, but the fast approaching tram easily pushes them away. The tram continues the run and turns on the bridge







2D storyboard

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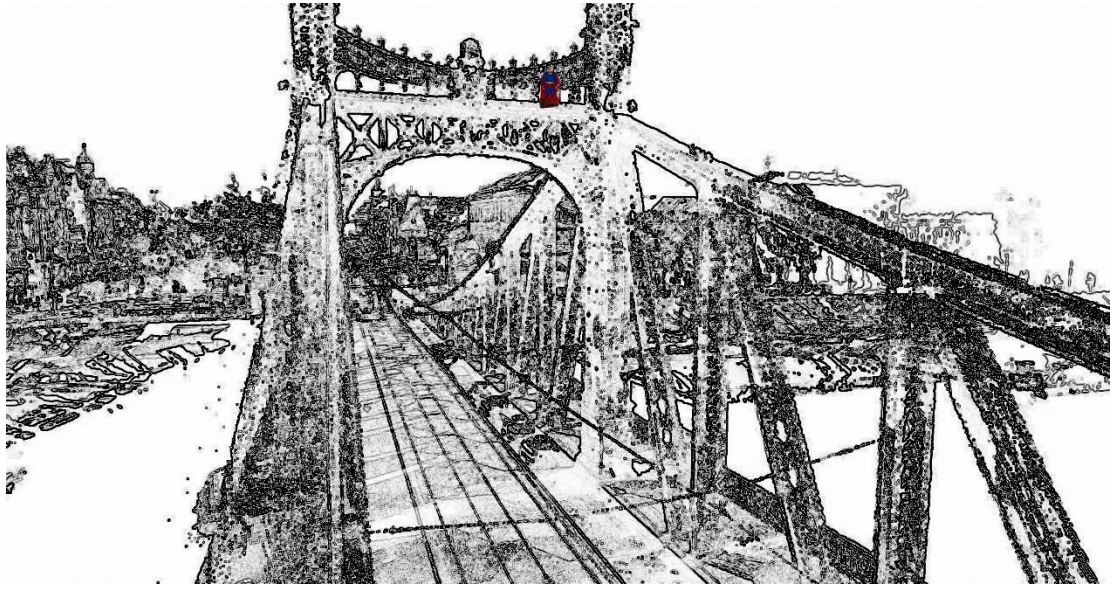

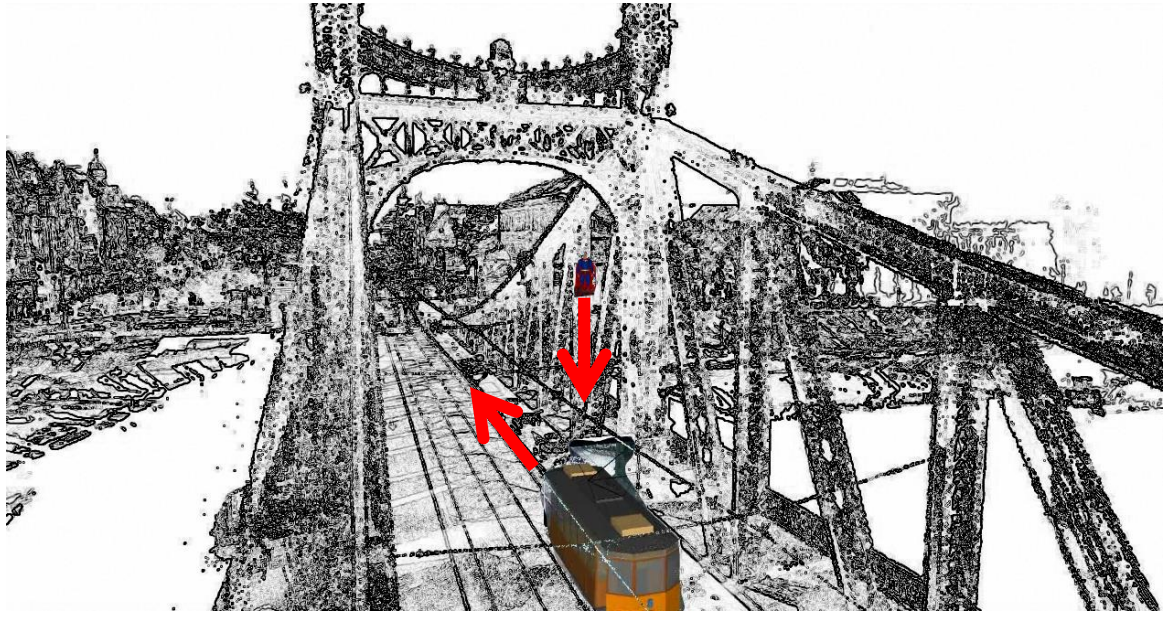

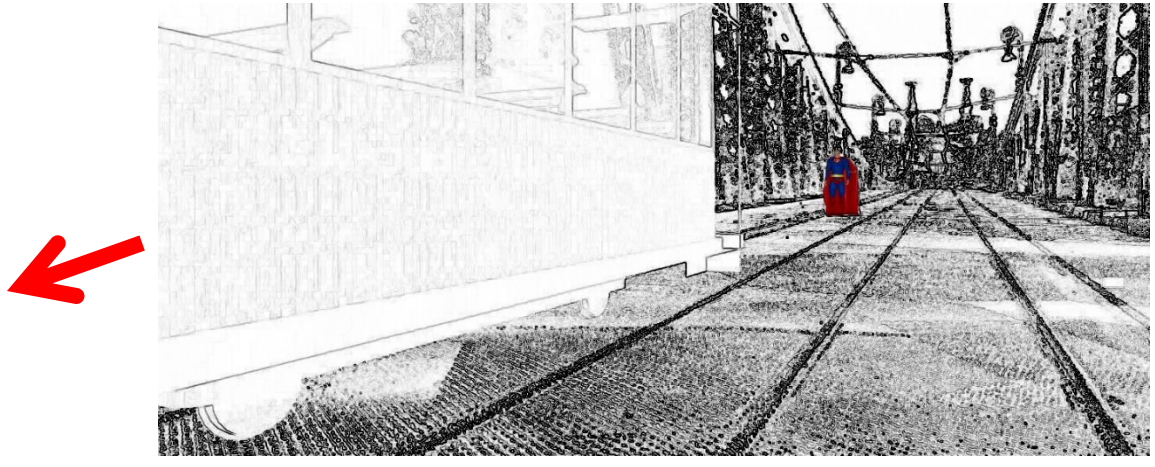

2D storyboard

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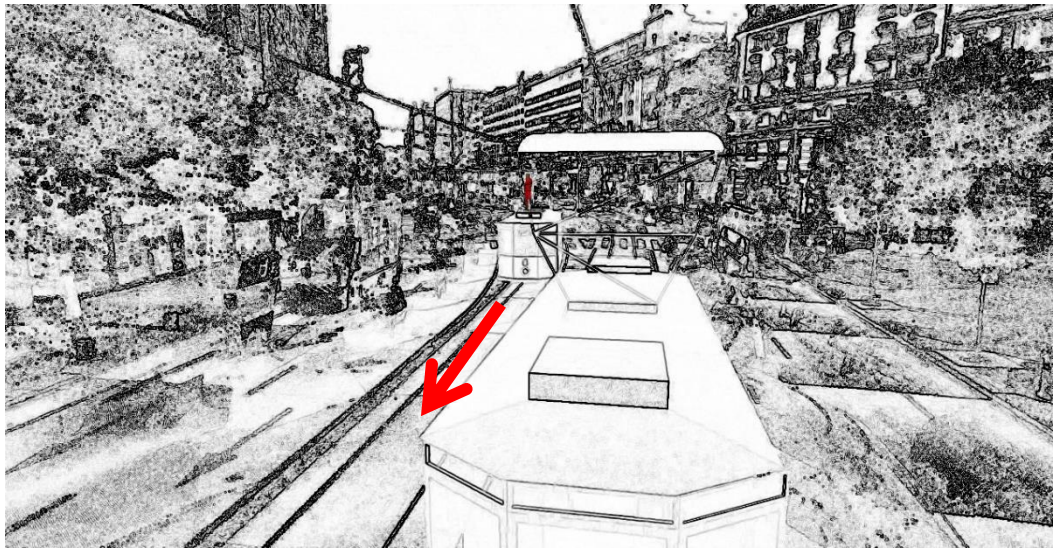

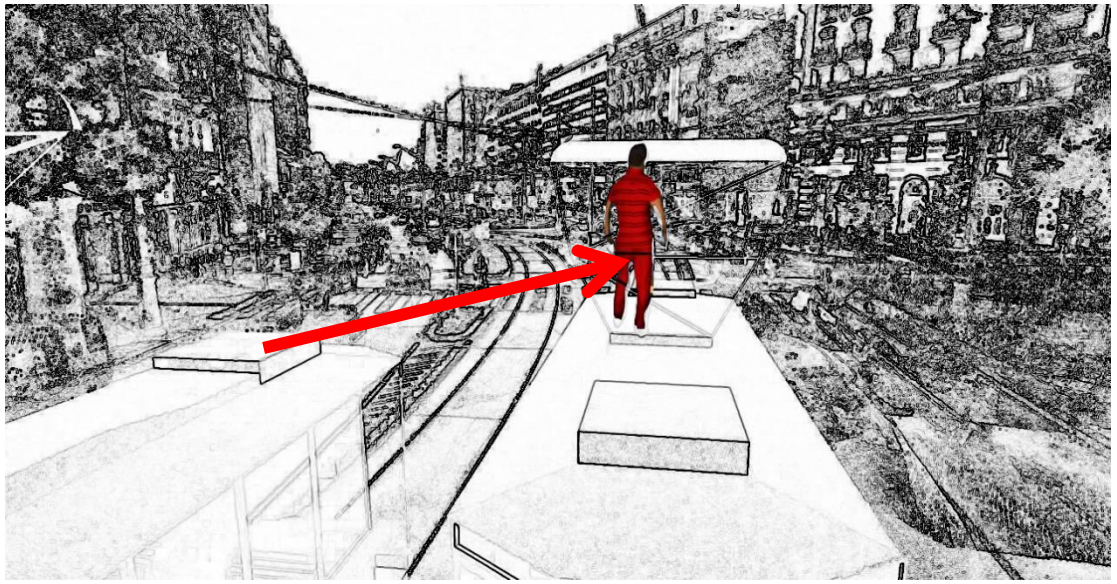

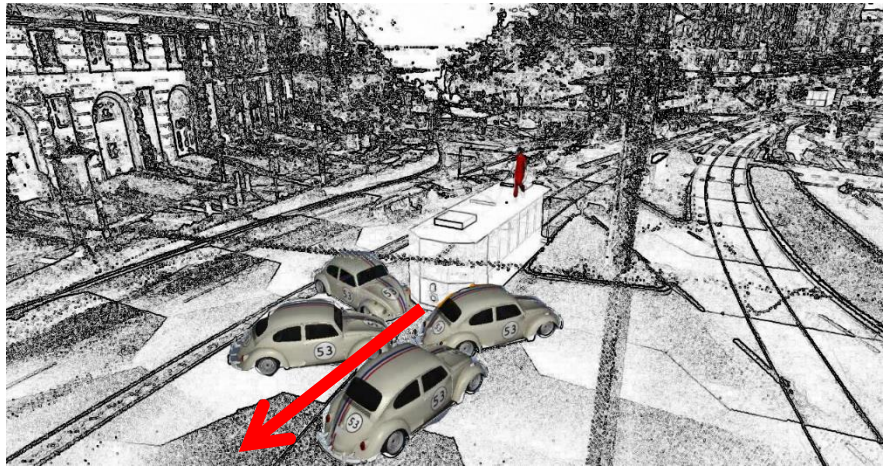

2D storyboard

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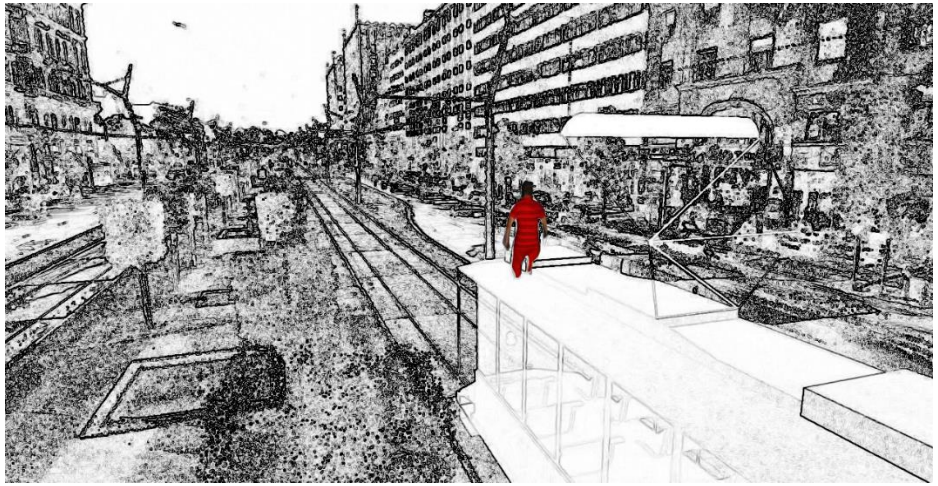
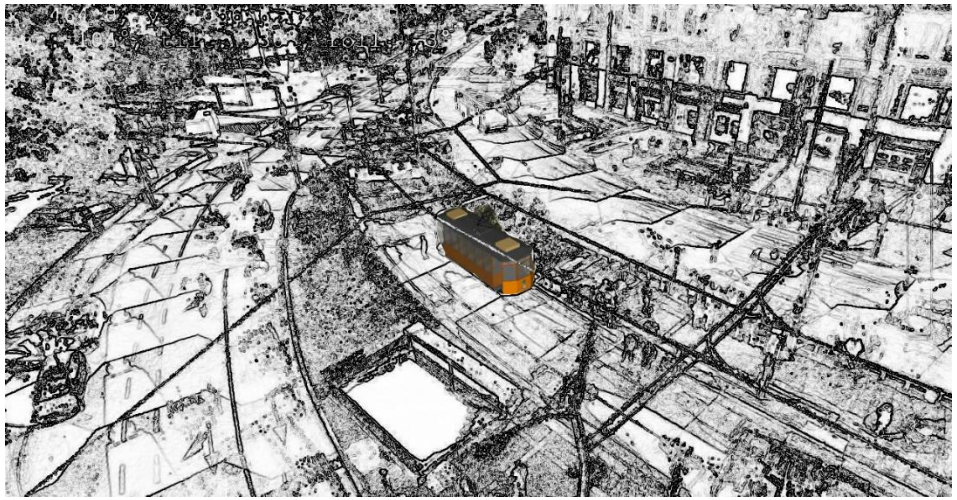
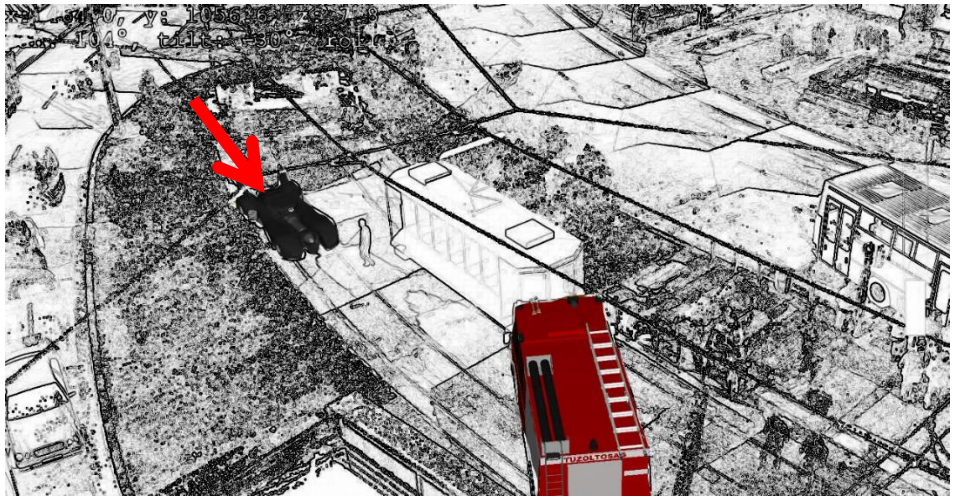
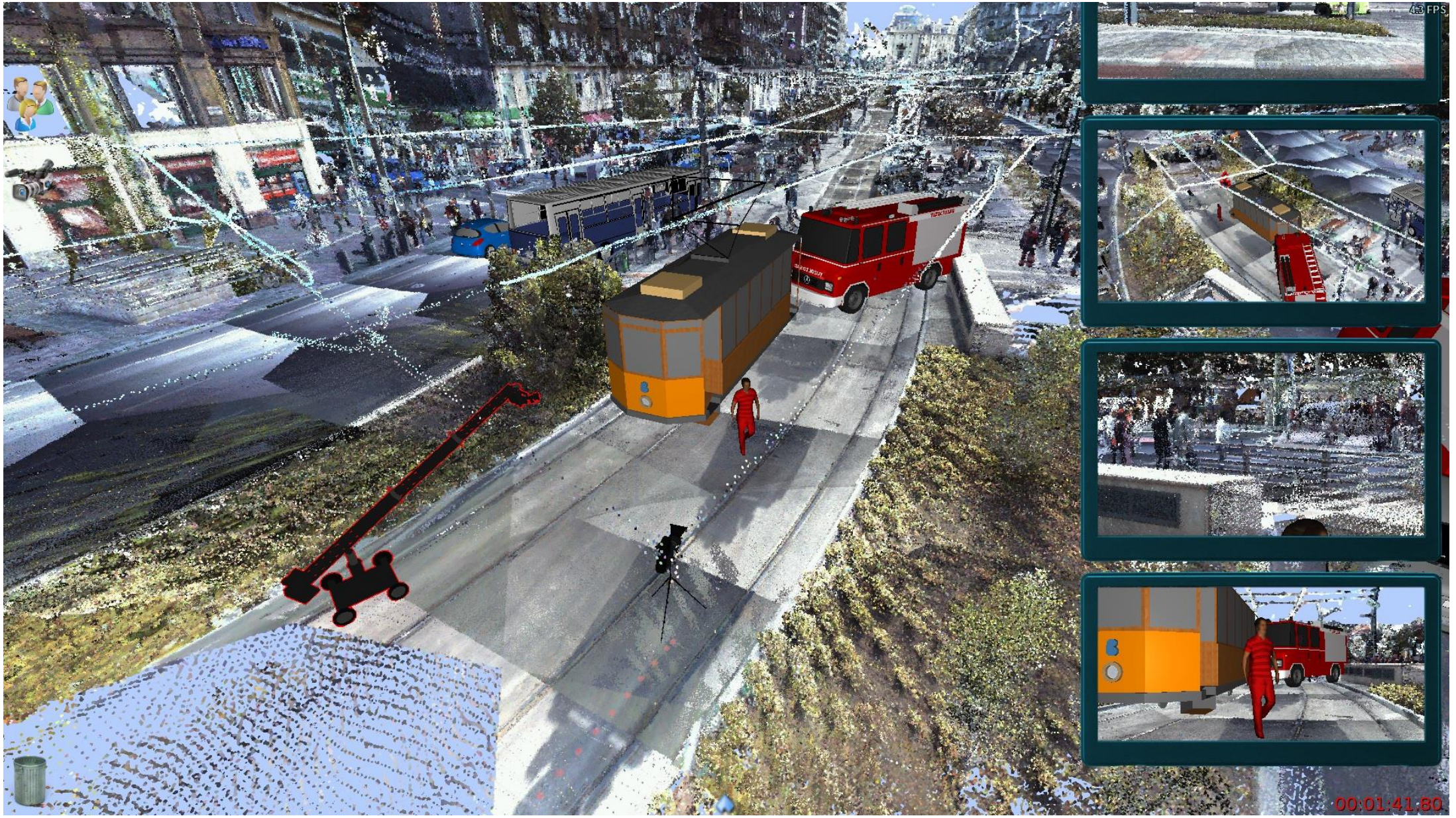


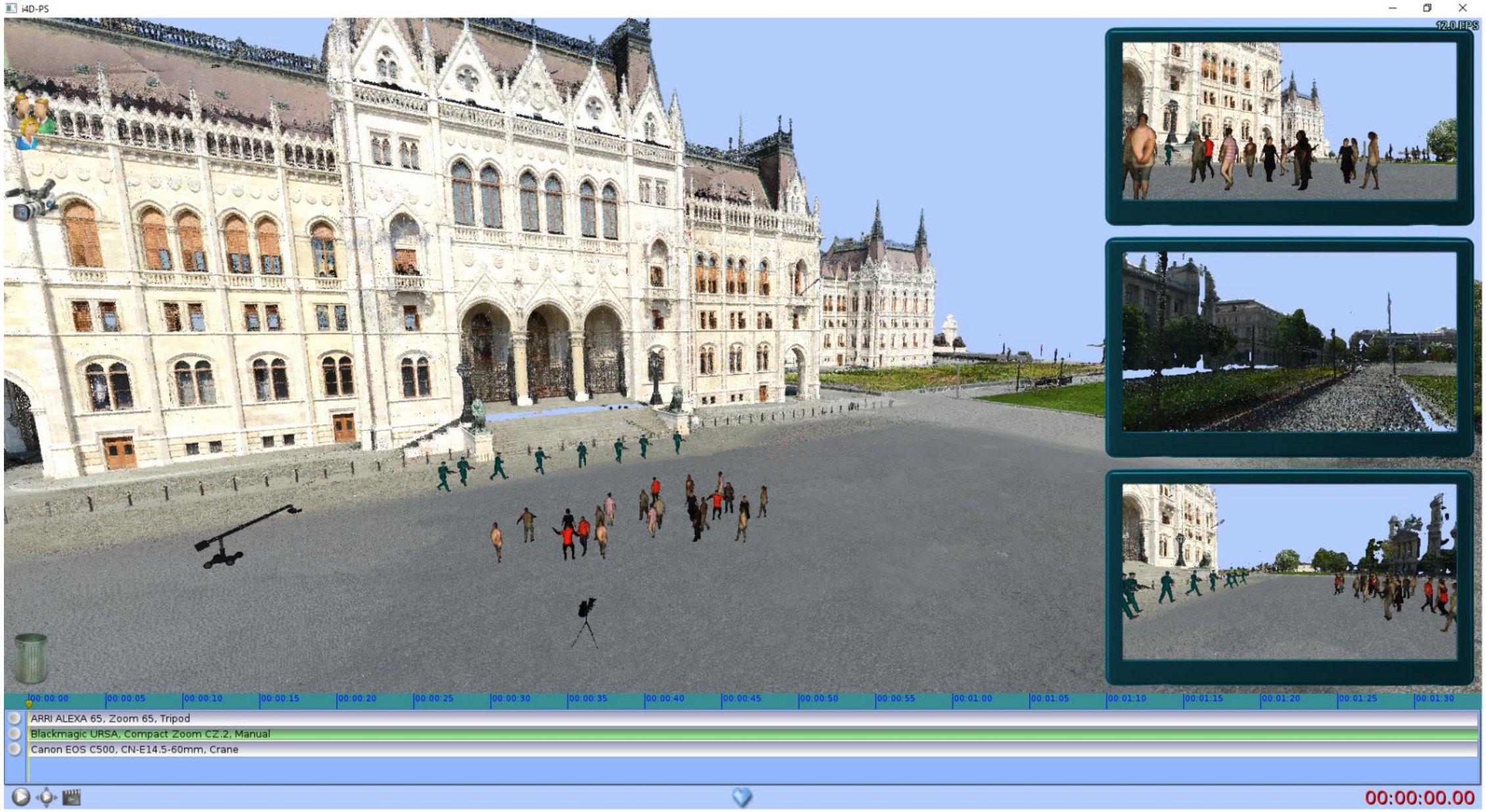




Preview of a simulated scene



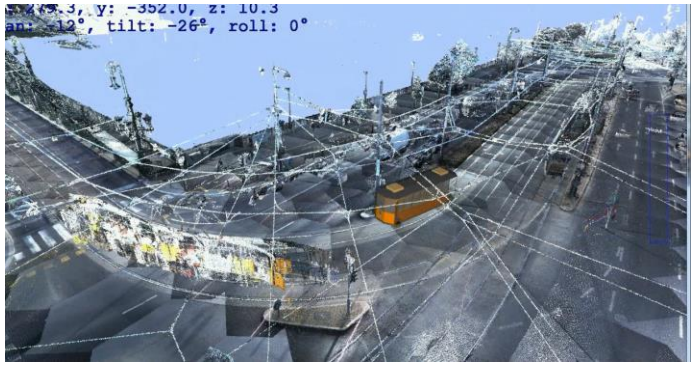
Preview of a simulated scene/2

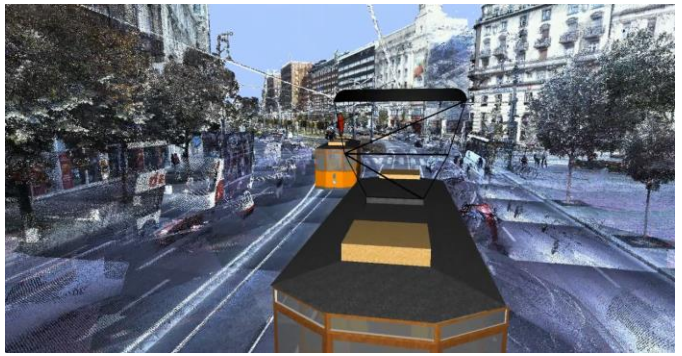


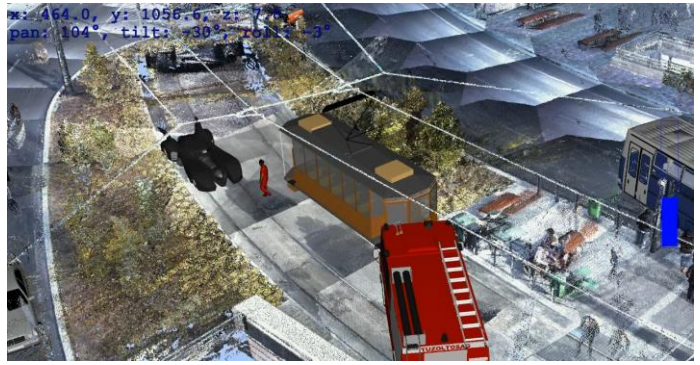
Realistic camera movement simulator

Simulated film scene

Some key frames from the resulting movie clip







Key features of the i4D Previz technology

1. **Fast preparation** and **instant preview** *of the scenario*
2. **Accurate and detailed location mapping** – *full scene exploration with an accuracy of <1cm*
3. **Realistic objects and motion** - *help to imagine how a complex choreography will look like*
4. **Precise measurements and settings** - *exact placement of actors, props, cameras in the 3D scene*
5. **Scalable**
   - *light version*: good value for money with appropriate functionality for wide public
   - *professional version*: unlimited options for making the previs more realistic

Competitors: storyboarding & previs tools

Keyframe tools

StoryBoard Artist Studio

- 2D keyframe sequence
- Fast editing & printing (pre-defined elements)
- Text captions, 3D arrows for story outline

Fast, ~~accurate,~~ ~~real moves,~~ ~~measurements,~~ scalable

3D software tools

Frameforge Previz Studio

- sketch style 3D scene
- manual scene editing
- manual character posing

~~Fast~~, ~~accurate~~, ~~real moves,~~ measurements, scalable

3D previs services

Third floor

- Pre-visualization using CGI, VR, motion capture etc.
- Unique CGI development for each film by a complete team of programmers and graphic artists

~~Fast~~, ~~accurate~~, real moves, measurements, ~~scalable~~

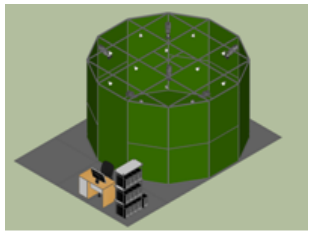
Summary: integrated 4D (i4D) technology

i4D – GIS: 3D Space Scan System

Laser scanner

3D virtual space generation software module

i4D – SysCapture: Dynamic Object Capturing Studio



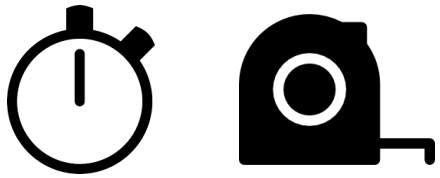
4D Reconstruction Studio

4D avatar creating software module

i4D SysMain

Scenario editor software module

<u>Output 1:</u> Editable & viewpoint-free simulated film clip



<u>Output 2:</u> precise technical data of timing, object positions and virtual camera parameters

Team

Csaba Benedek, Ph.D, (R&D) *computer vision scientist*, *project manager,* co-author of more than 50 research papers, leader of various R&D projects in the recent years.

"It is exciting to see how our research innovations could be exploited by the worldwide film industry. We are certain that i4D-PS system will make the film production process more efficient and more limitless in planning"

Zsolt Jankó, Ph.D, (R&D) *scientist, senior developer, expert of algorithms, hardware and software components* in computer vision and geometric modeling. Co-creator and leader of developments in the SZTAKI 4D Reconstruction Studio.

"Many people use 3D as a buzzword today. However, our aim with the i4D-PS system is to exploit the real opportunities in 3D digital content provision."

- **R&D development:** Csaba Benedek and Zsolt Jankó
- **Innovation consultant:** Daniel Kozma