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Agenda

- VRMotion Ltd.
- VR Technology
- Journey since last EASA Rotorcraft Symposium
- What's next?



1998
1999
2000



2014
2015
2016
2017
2018
2019



The AERO is the largest general aviation exhibition in Europe and when it comes to innovation even world wide.



Thank you for visiting VRMotion at the aero exhibition in Friedrichshafen.

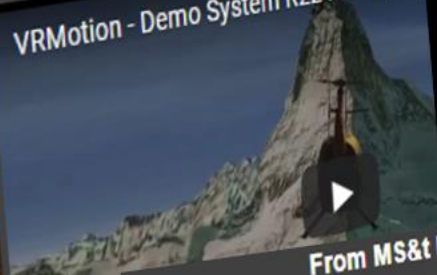


ABOUT THE FUTURE OF PILOT TRAINING!

"On the platform, I recognized Mr. Claude Vuichard, which I already knew to be involved in the process – that made me even more interested and curious about the project. I later found out Mr. Vuichard was testing some of the latest tweaks done on the R22: Stuff that you

We are proud, to show you our first Robinson R22 helicopter

VRMotion - Demo System R22 Helicopter



From MS&T



"Not only did the motion exaggerate when you were part of it, the degree of engagement meant that motion sickness was a non-starter. Plus – and this is important when dealing with emotionally adolescent sub-species like military aircrew – it was a lot of fun!"



MS & T MAGAZINE
INDUSTRY SIMULATION & TRAINING AWARDS
FINALIST

2017



Martina Lernt Fliegen



SRF

DIGITAL





2018



VRM[®]
SWITZERLAND

2017



2016

IPACS



1998



2015



2014

2013







Virtual Reality (VR)

A totally immersive environment

Monitor - Multiple Monitors - VR

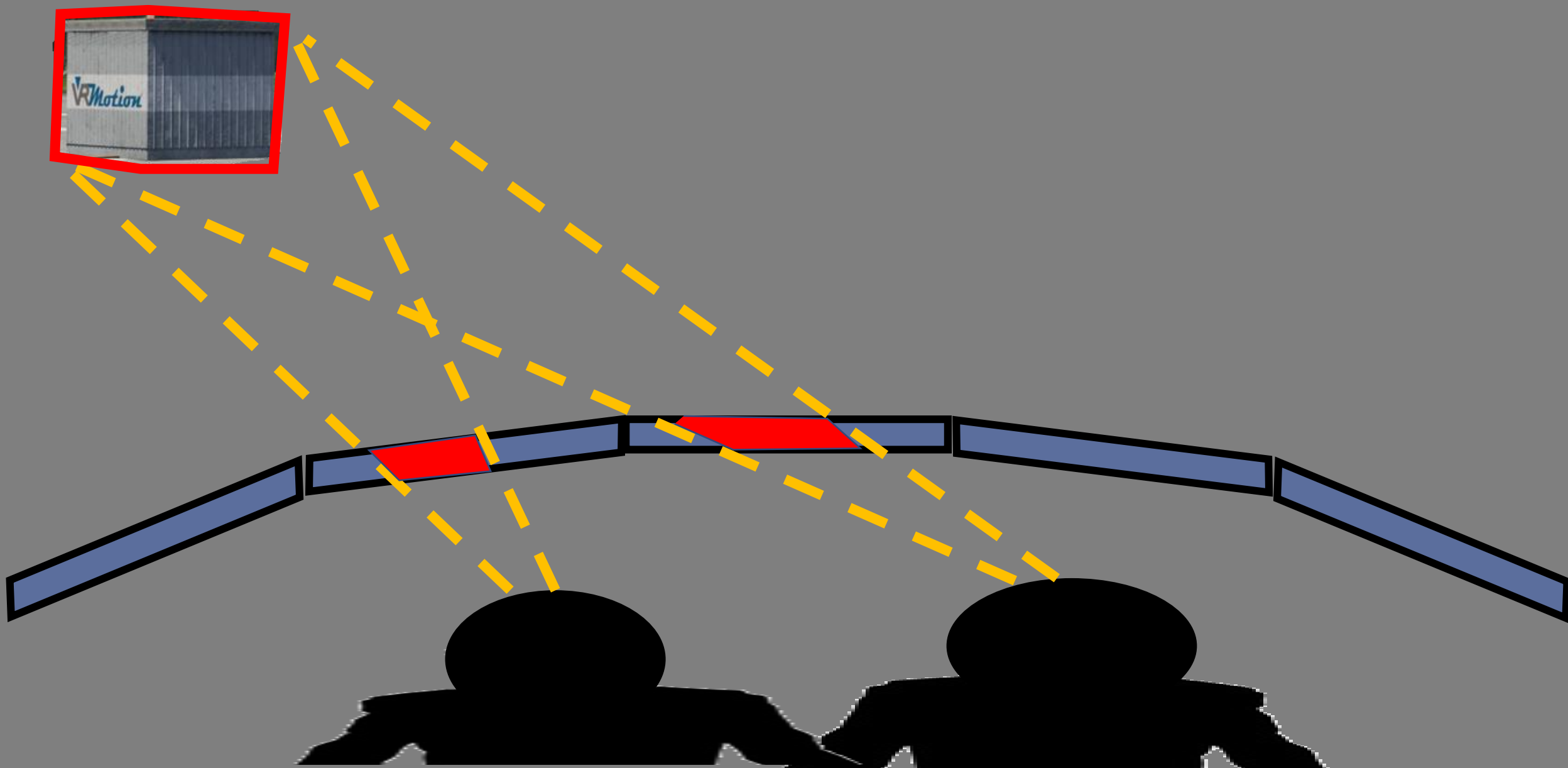
Field of View (FOV)

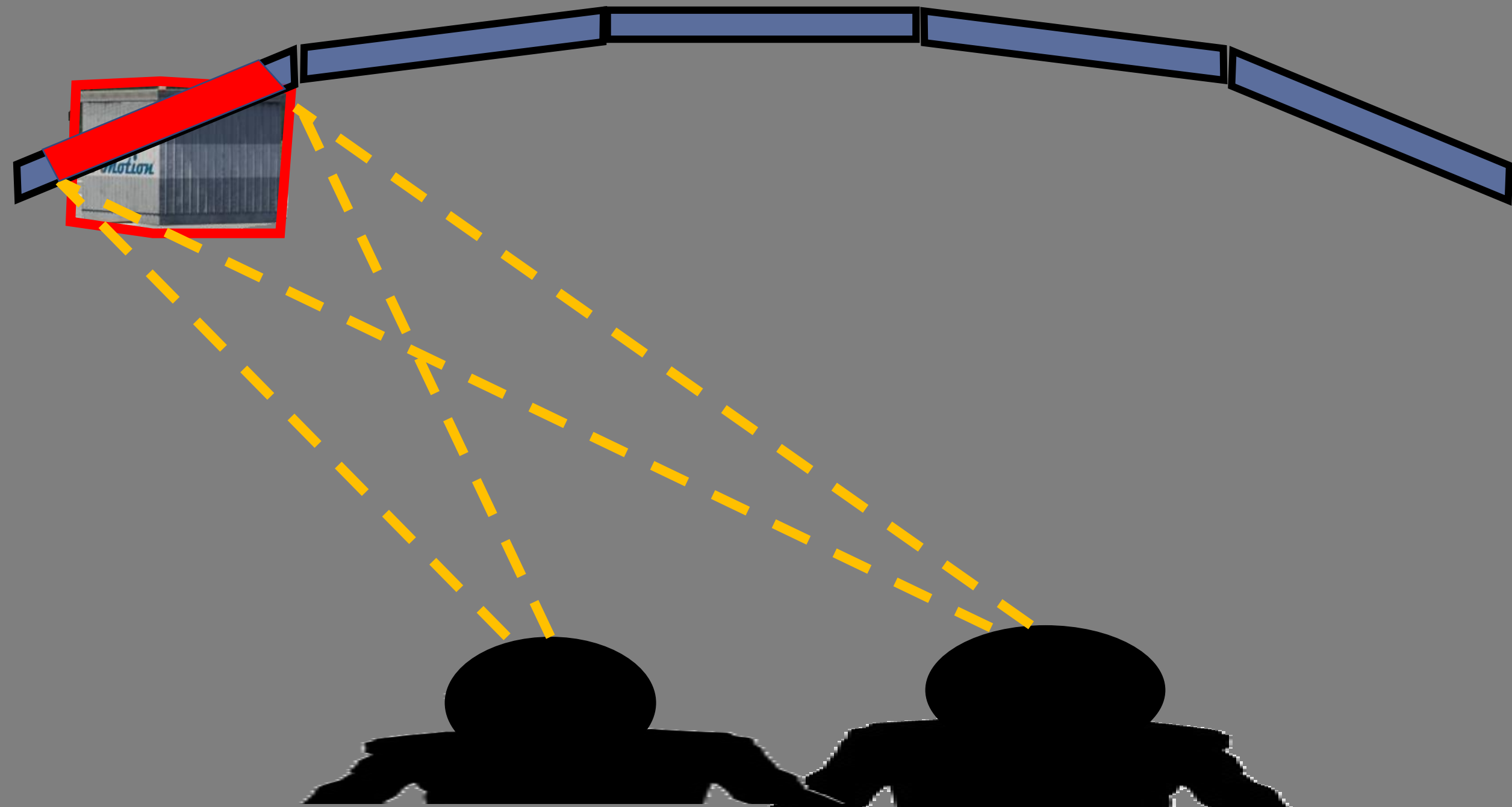


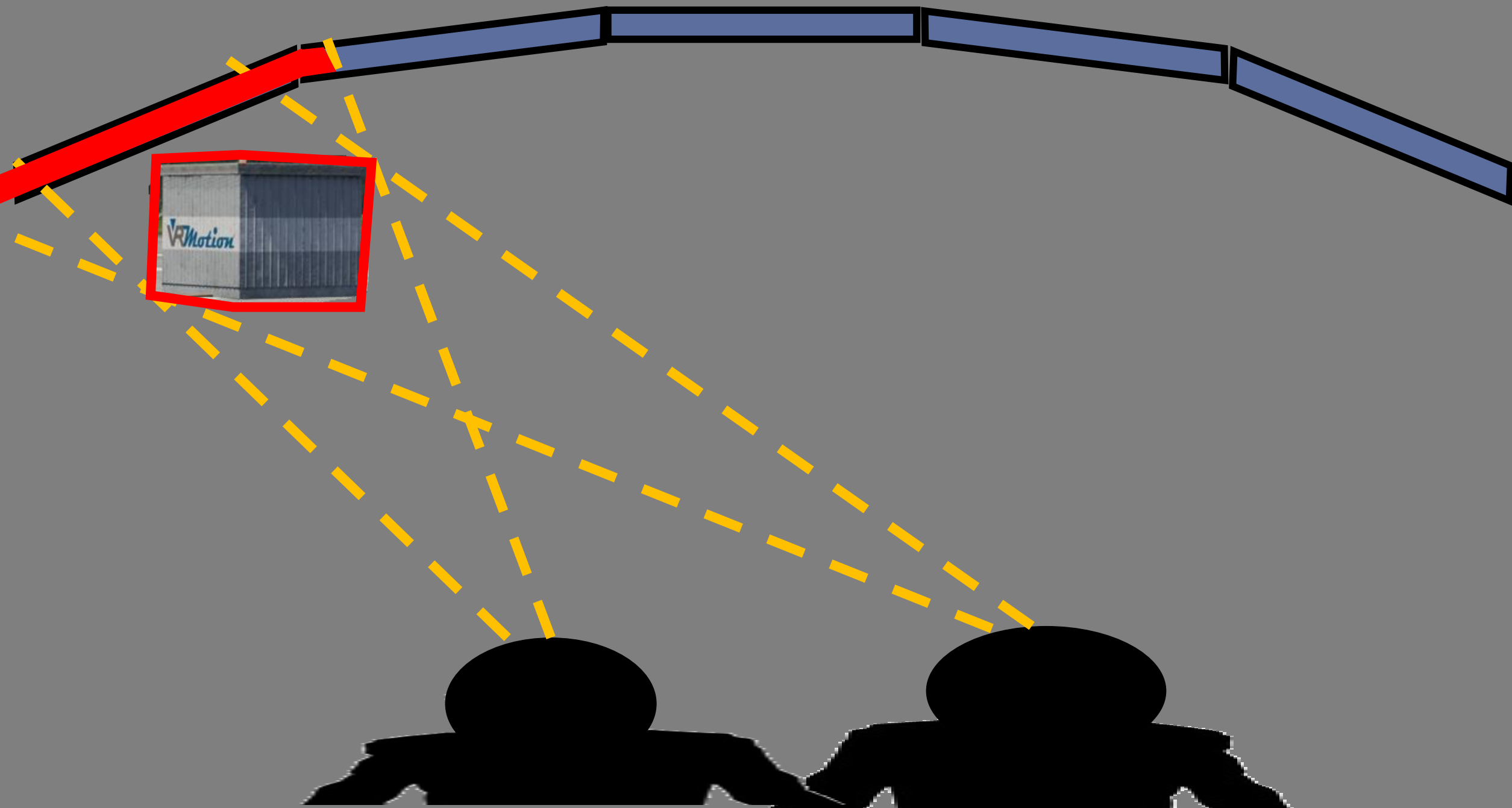
Monitor - Multiple Monitors - VR

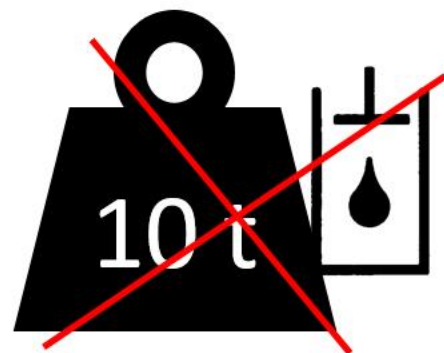
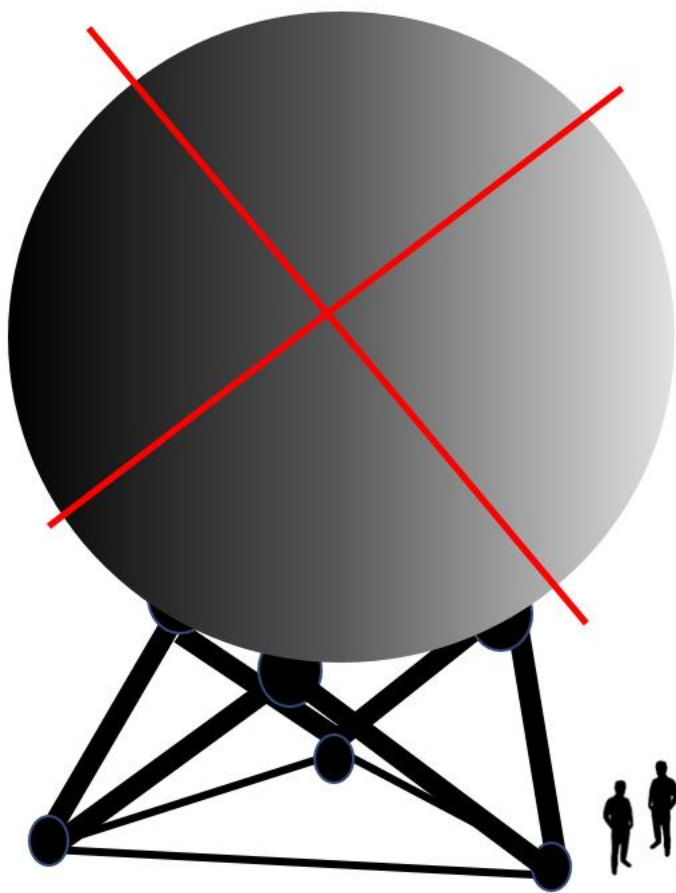










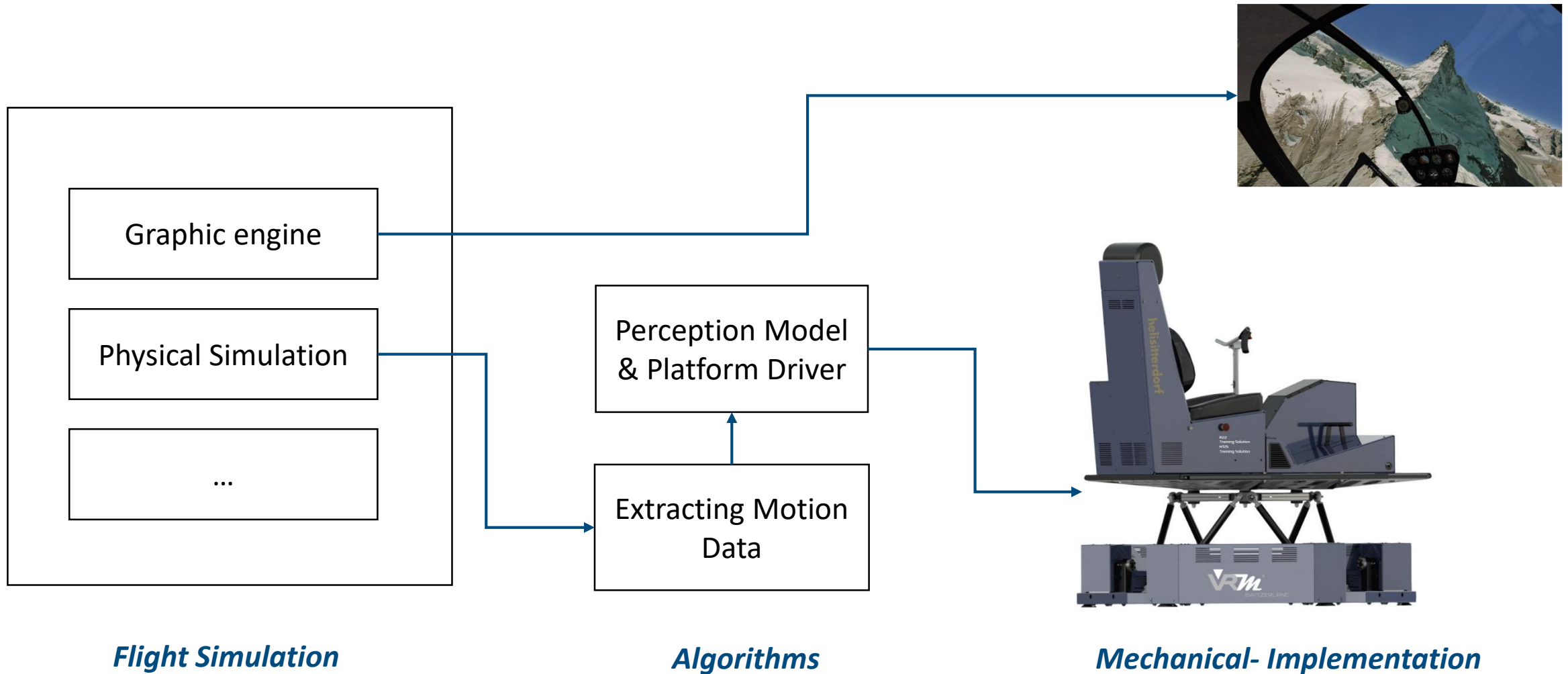


affordable and more realistic

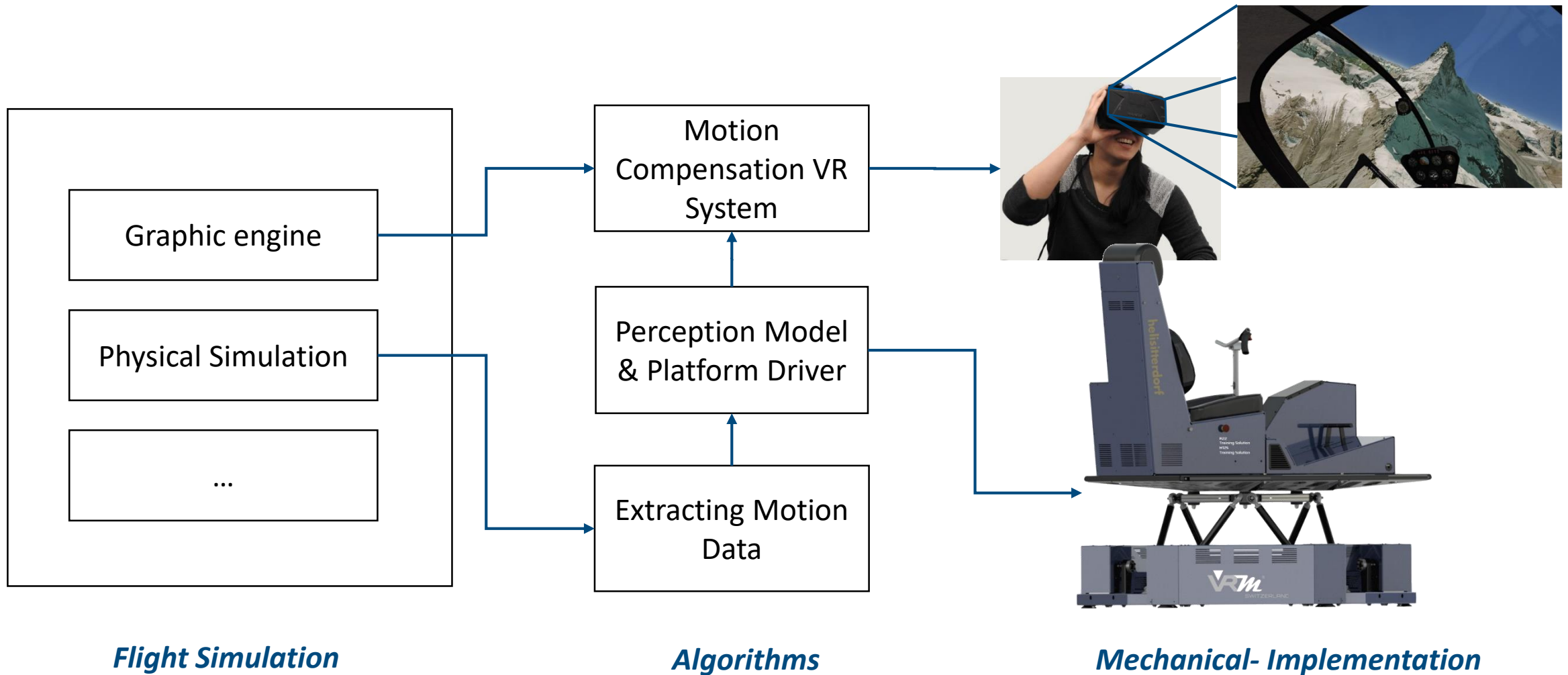


System Description

System Description – The setup stays the same..



System Description – ... With some tweaks



Simulation

Graphic engine

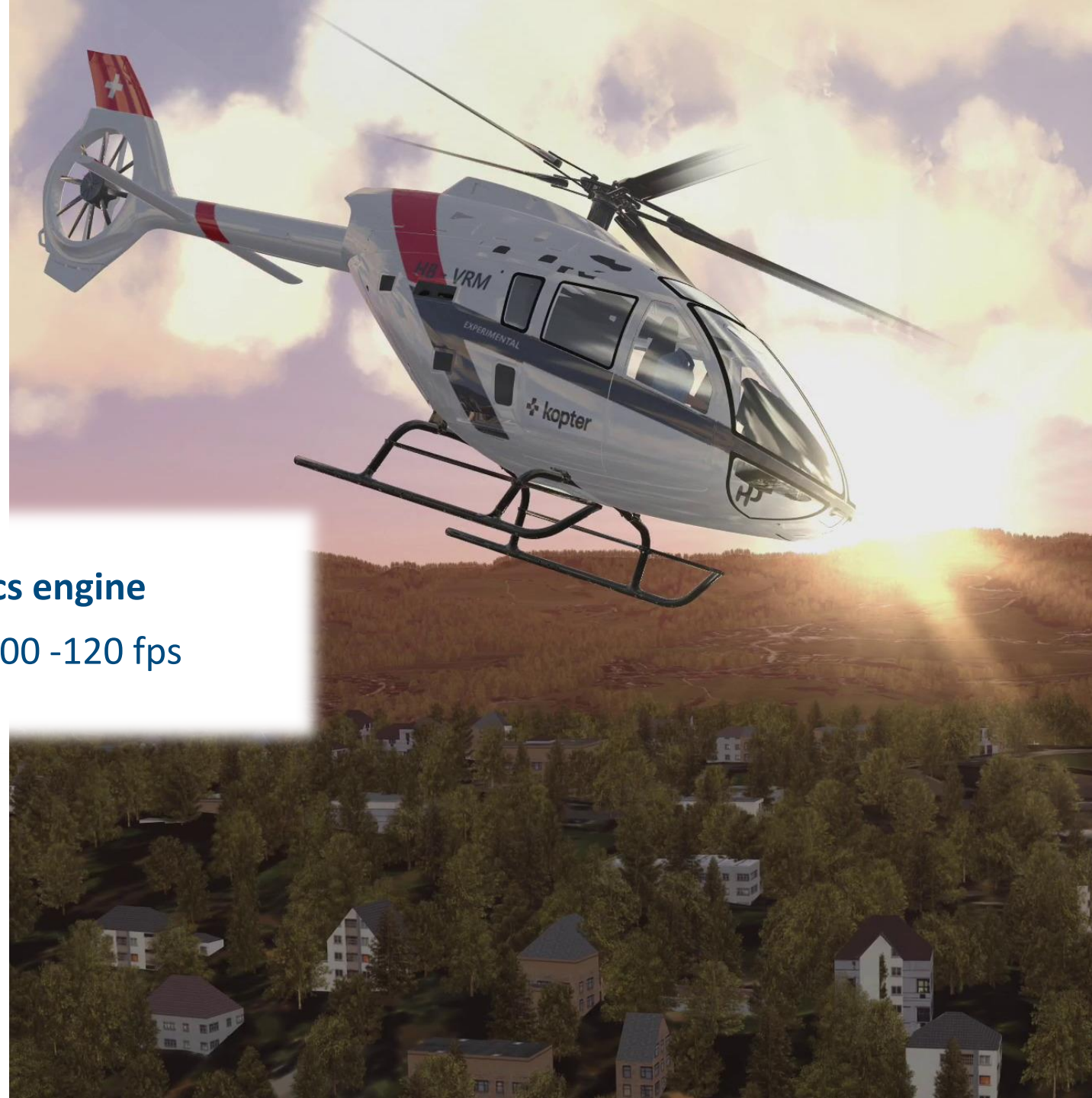
Physical Simulation

...

Flight Simulation

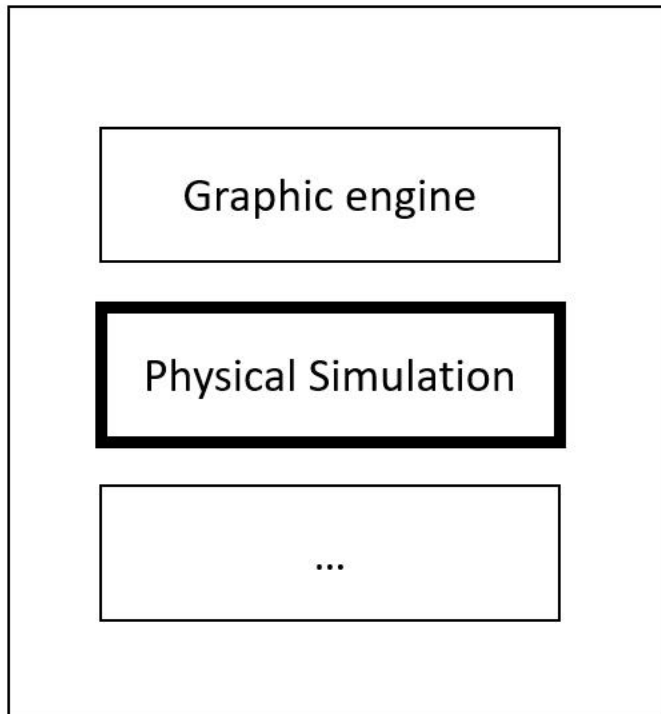
Graphics engine

- VR: 100 -120 fps





Simulation



Flight Simulation



- Numerical kinematic simulation
- Physics simulation resolution: 1ms (1kHz)
- Flight Data Validation



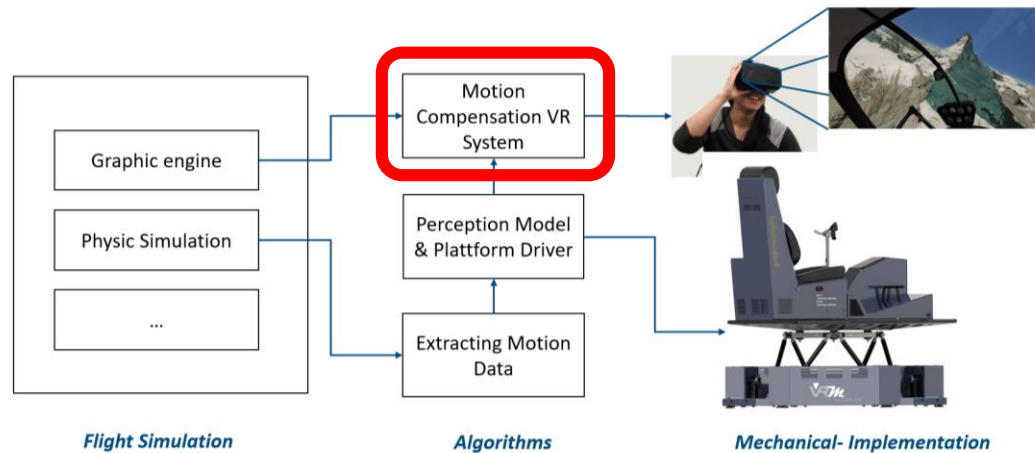
VR Challenges

VR-Challenges

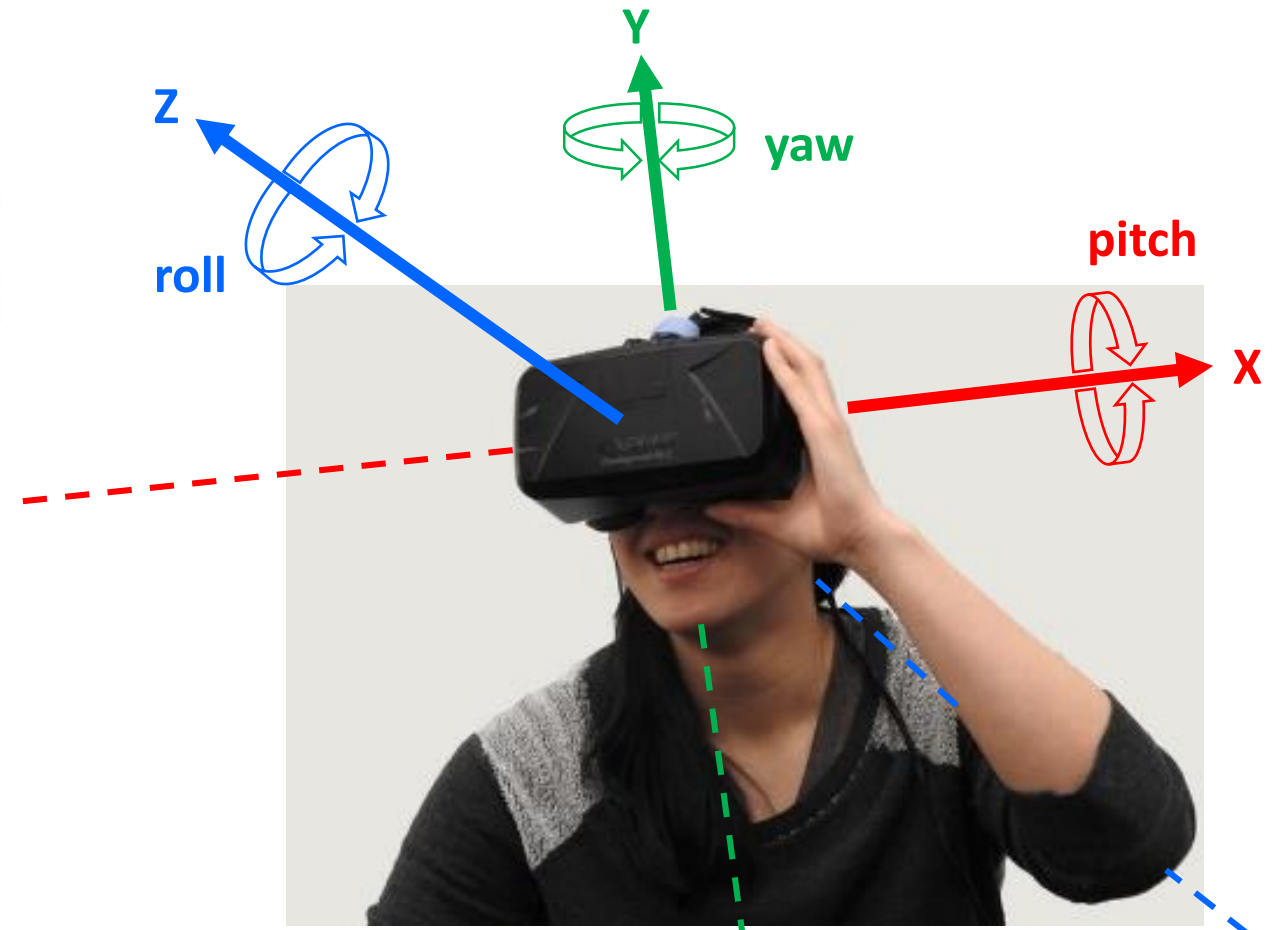
- Motion Compensation (frame accuracy)
- Cockpit Work
- Multi Crew
- Motion Sickness
- ...

VR-Challenges: Motion Compensation

Graphics Engine:
“Last Minute” pathway for motion compensation



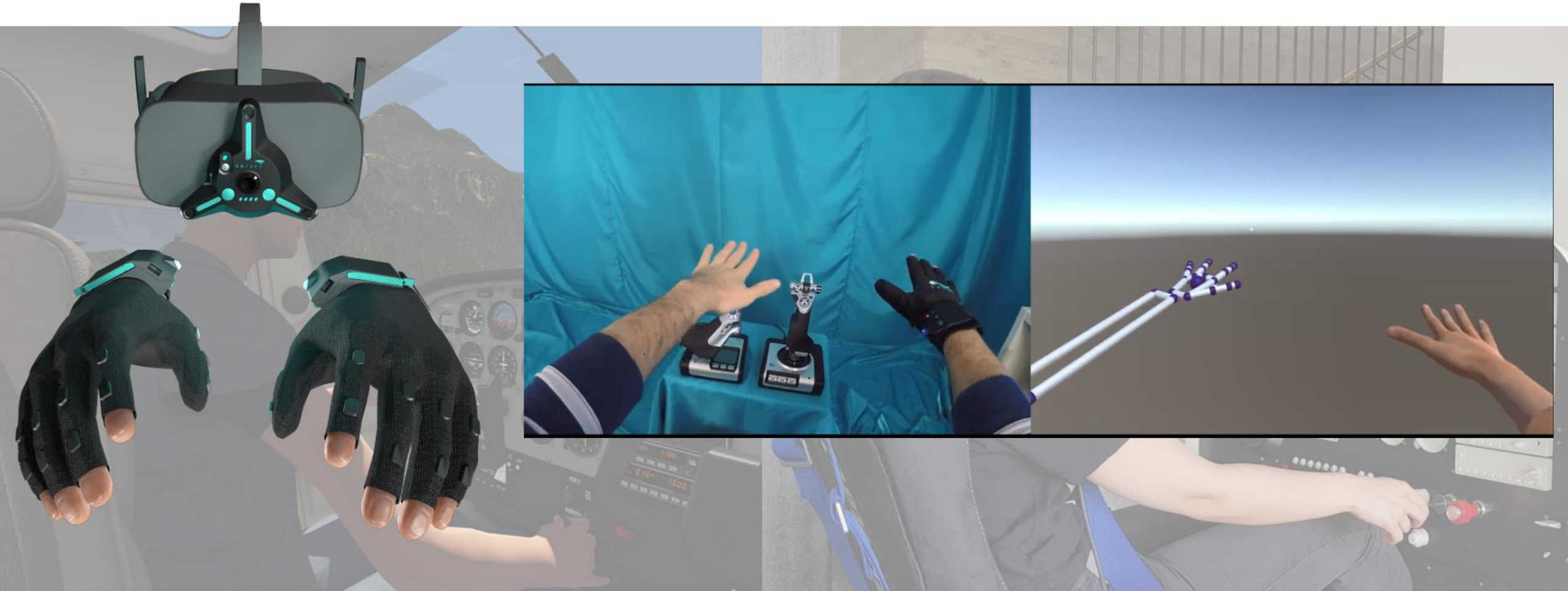
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VR-Challenges: Cockpit Work



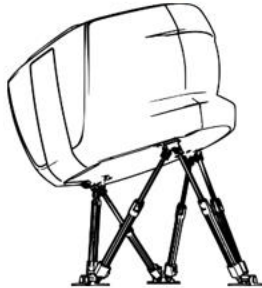
VR-Challenges: Cockpit Work







Current high-end simulators



- + High realism
- Huge size
- Server site needed
- Very expensive

Current low-end simulators



- Lack of realism
- Motion sickness
- Limited scenarios
- + Affordable



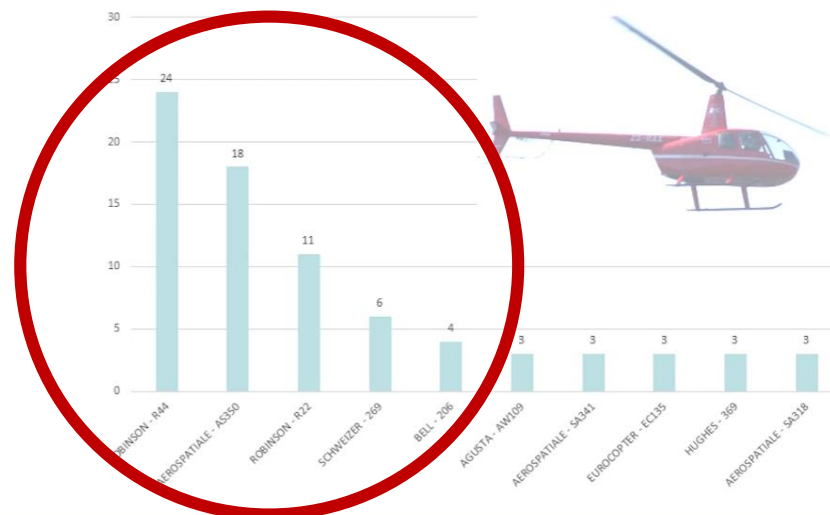
- + Ultimate realism
Supremely immersive experience
- + Unique training possibilities
Ground to air: successful hover training: youtu.be/SDI7irsUg7I
Special ops: HESLO: youtu.be/ni_PgoxqCXs
Emergency training: autorotation: youtu.be/VP-TvbaLKco, vortex recovery: youtu.be/IMuAtWz8_48
- + Convenient operation
Easy installation, compact setup, low maintenance
- + Home base training
Light rotorcraft simulator
- + Endless training scenarios
- + Affordable

40'091 civil rotorcraft



III.4 New training devices and simulators

Top 10 Rotorcraft Make/Models by number of fatal accidents during 2008 - 2017 in EASA MS



Rotorcraft Symposium - December 2018

- Copter types with **many fatal accidents** during 2008-2017
- Copters of this types are used for training
- **Copter** of this types **cost 10...40 times less** than traditional full flight helicopter **simulator**



Affordability - VR and advanced hardware create a solution that is highly affordable



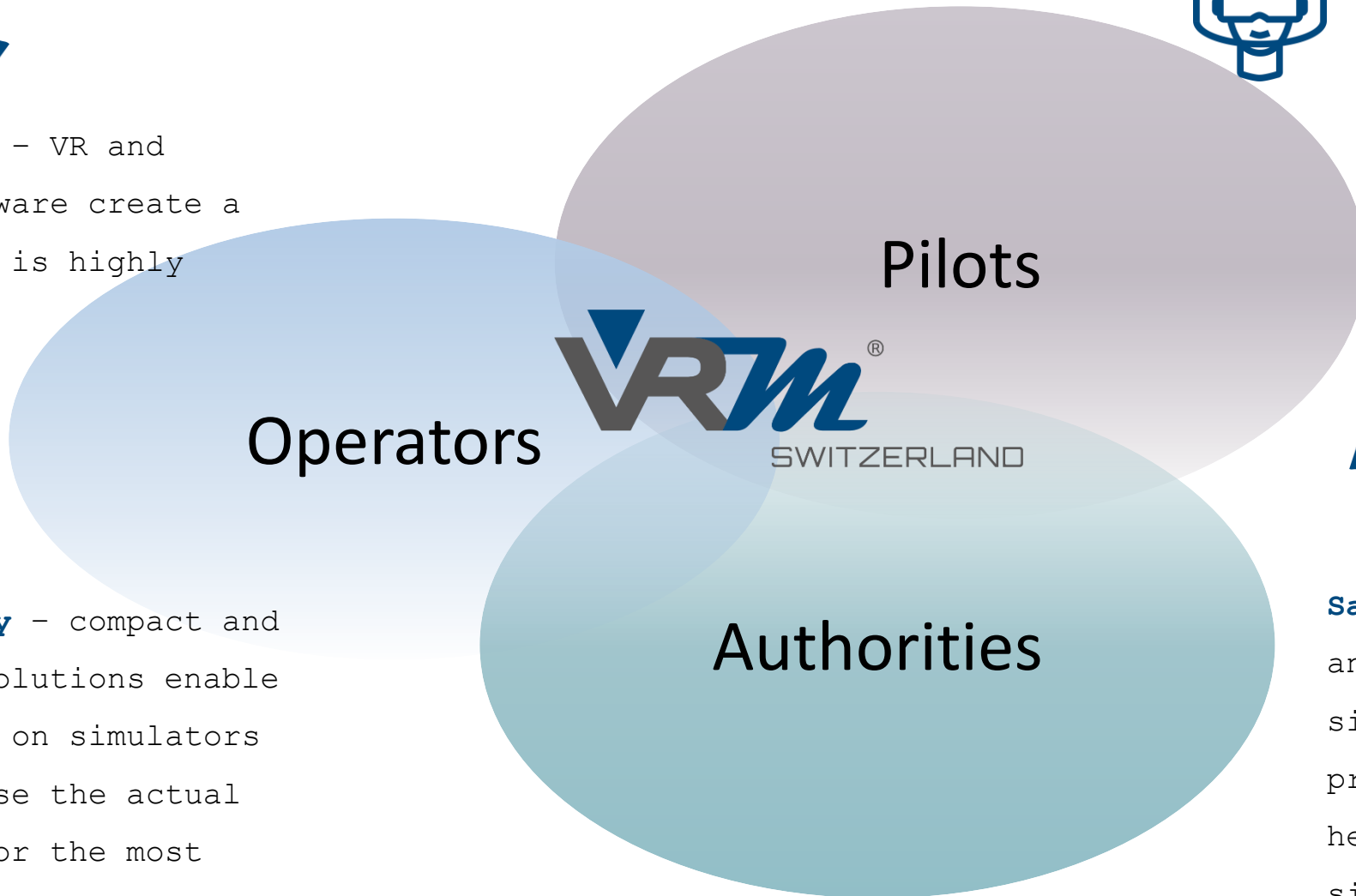
Sustainability - compact and inexpensive solutions enable more training on simulators and help to use the actual helicopters for the most effective tasks

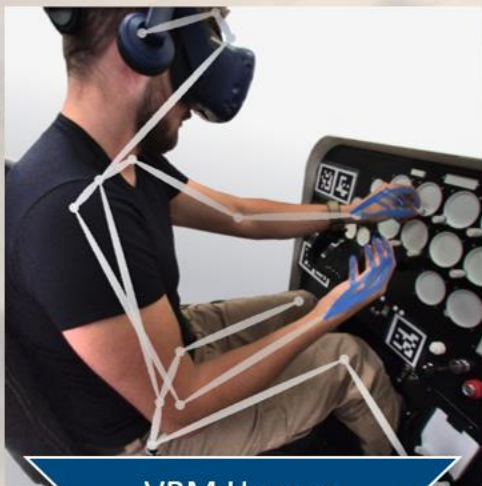


Realism - solution provides the best user experience, letting pilots train realistically at any time in any weather and without motion sickness



Safety - More realistic and affordable repetitive simulations can help prevent accidents in any helicopter training situations





VRM Human
Pose Tracking



VRM Flight Data



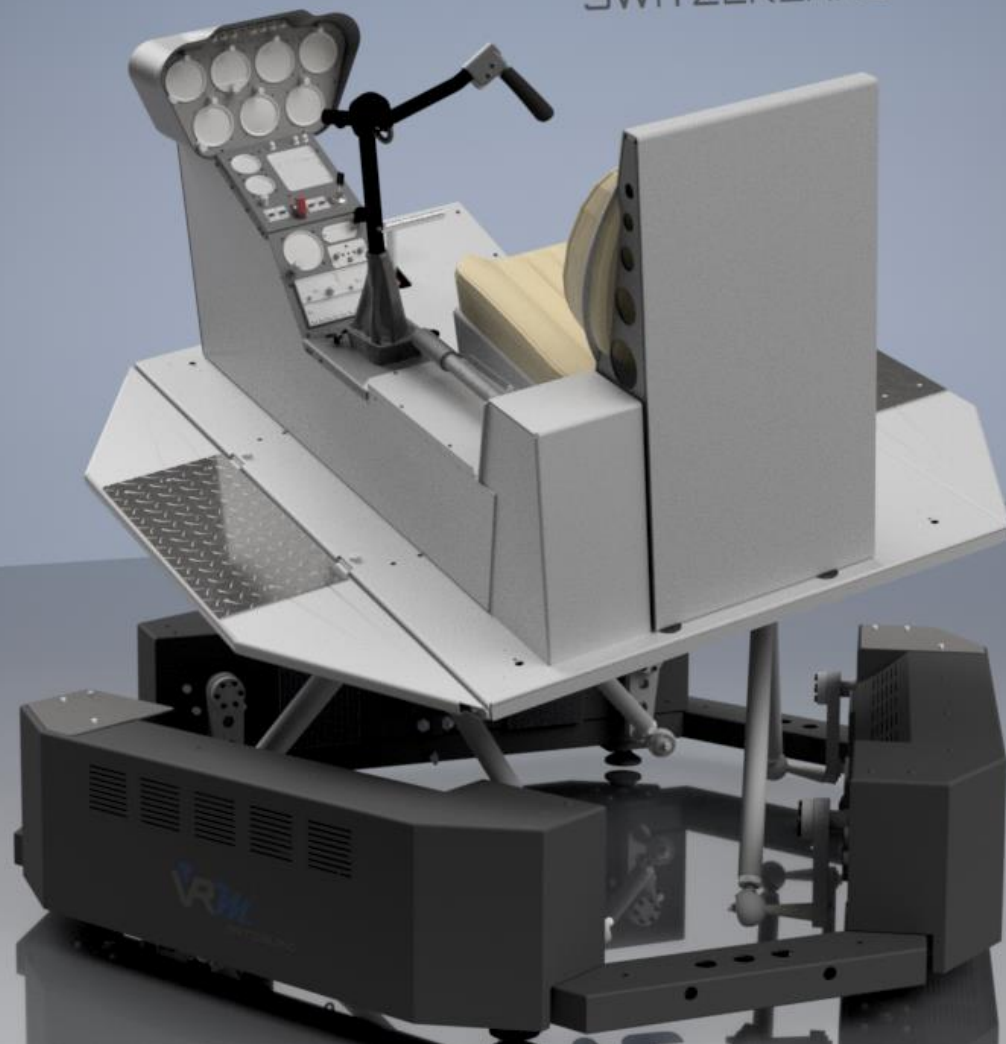
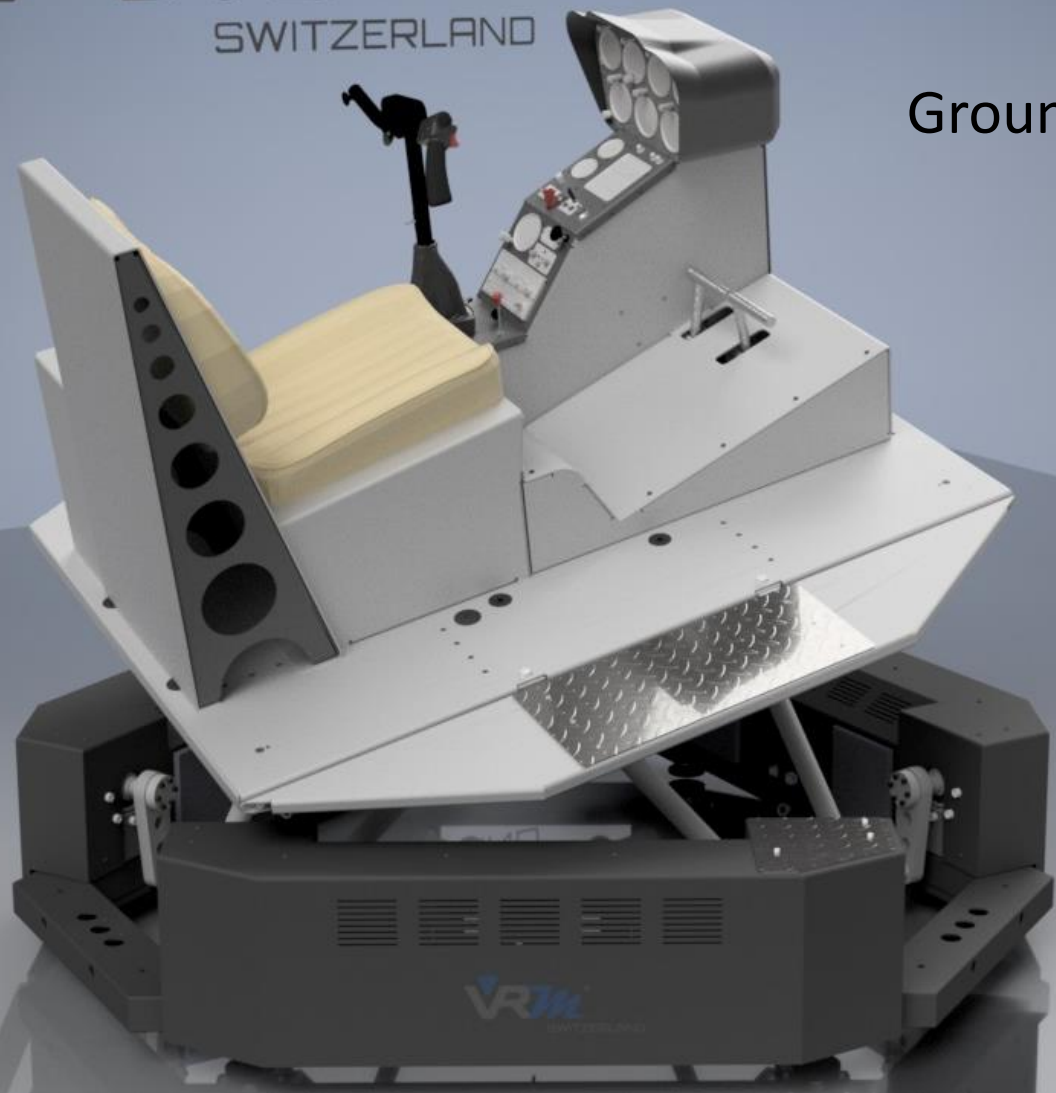
VRM CLS



VRM
SWITZERLAND



Ground to Air



Ground to Air on Simulator

take off / hover and land a Robinson R22 helicopter

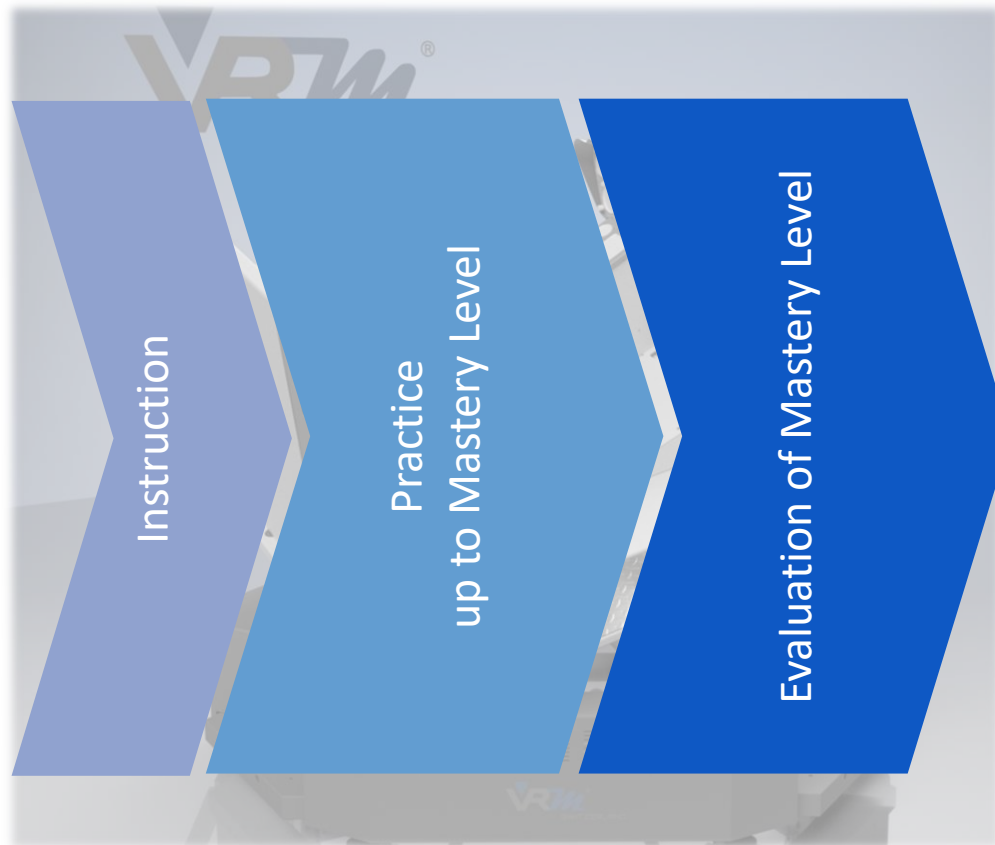
without aviation experience



Simulator



Helicopter





Bern Airport | Switzerland
5 June 2019



CHRISTOPH GRAF, MOUNTAINFLYERS CEO & OWNER:

“Am Boden trainieren und sicherer Helikopter fliegen! Als Erstkunde von VRMotion machen wir einen großen Schritt vorwärts auf dem Weg zu einer nachhaltigen, sicheren und kostengünstigen Pilotenausbildung.”

mehr erfahren

Operators





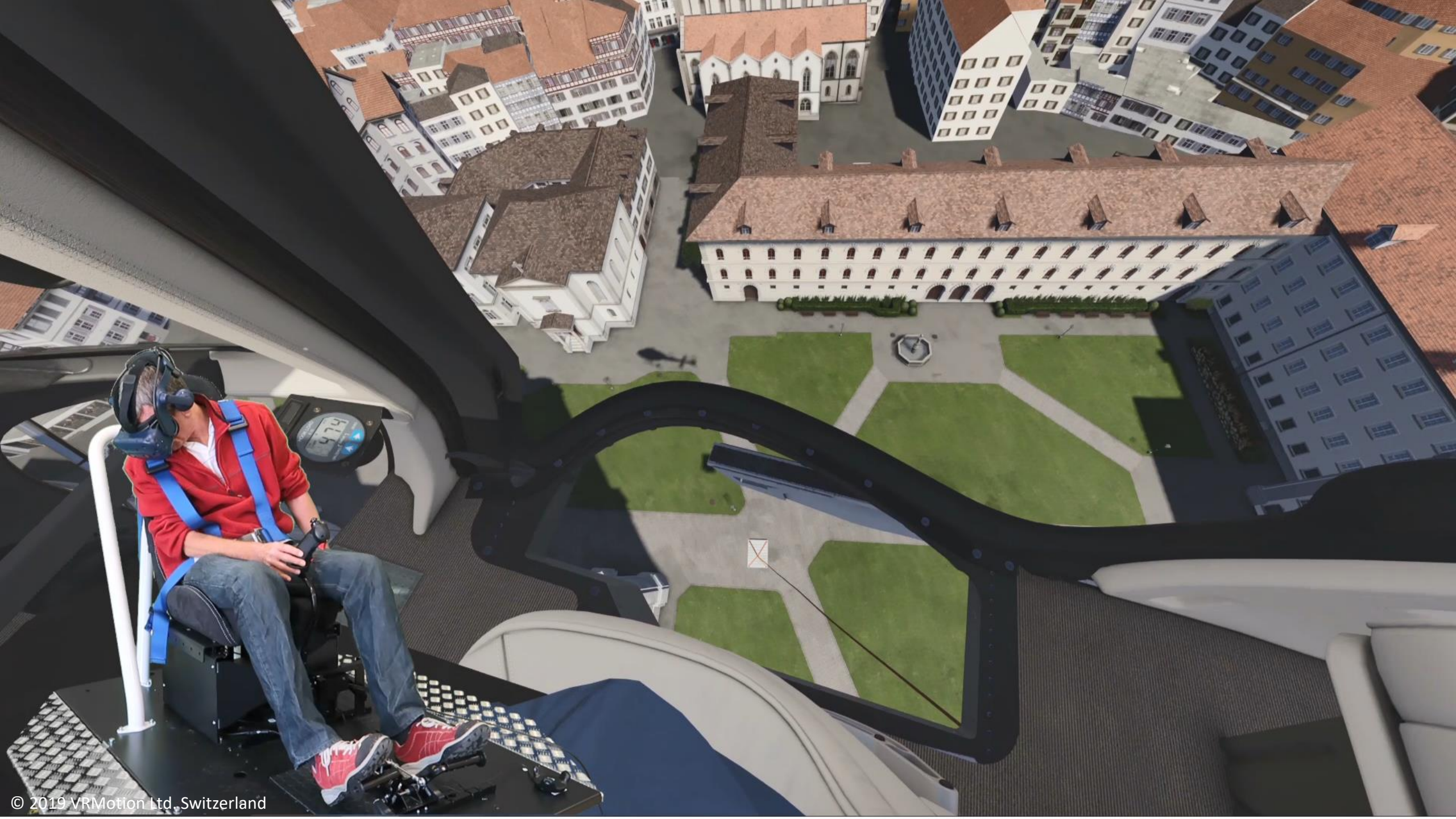




Operators







VRM R22 Trainer

The trainer simulates a Robinson R22 helicopter including steering forces. The cockpit is functional, and all the required operating elements are available. The simulator is used to learn all basic elements and to train emergency procedures.



VRM H125 Trainer

The trainer H125 enables trainings on a single turbine helicopter. From the familiarization to a turbine helicopter to demanding scenario-based trainings, mountain flying and emergency trainings, simulation is highly tailored.



VRM SH09 Trainer

This solution is developed together with the kopter group. It will be a fully functional simulation of kopter's SH09 single engine helicopter.



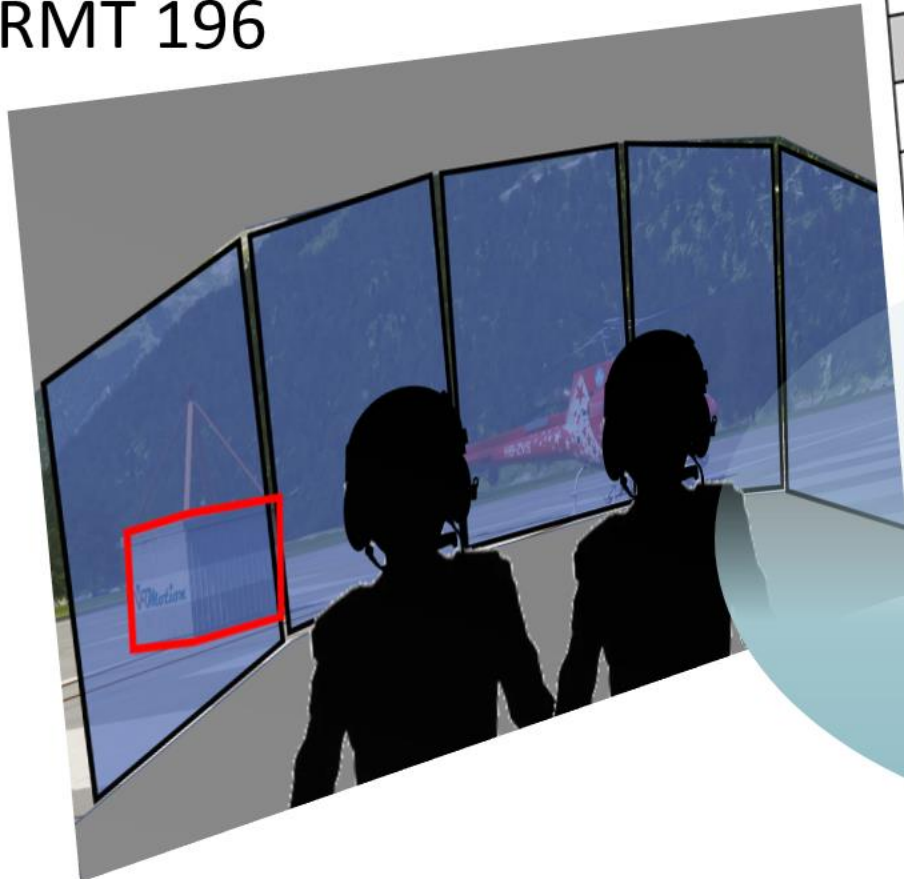
VRM HESLO Trainer

This training solution allows to learn the basics of the sling load operation with mirror and vertical reference technique. Different rope lengths and loads are available. The HESLO module can be added to the VRM H125 Trainer.



Innovation Partnership EASA

- CS-FSTD (H)
- RMT 196



TESTS	FFS			
	A	B	C	D
4. MOTION SYSTEM **				
a. Motion Envelope				
(1) Pitch				
(ii) Velocity				
± 15°/s	✓	✓		✓
± 20°/s			✓	✓
(iii) Acceleration				
± 75°/s ²	✓	✓	✓	✓
± 100°/s ²				

Authorities





Affordability - VR and advanced hardware create a solution that is highly affordable



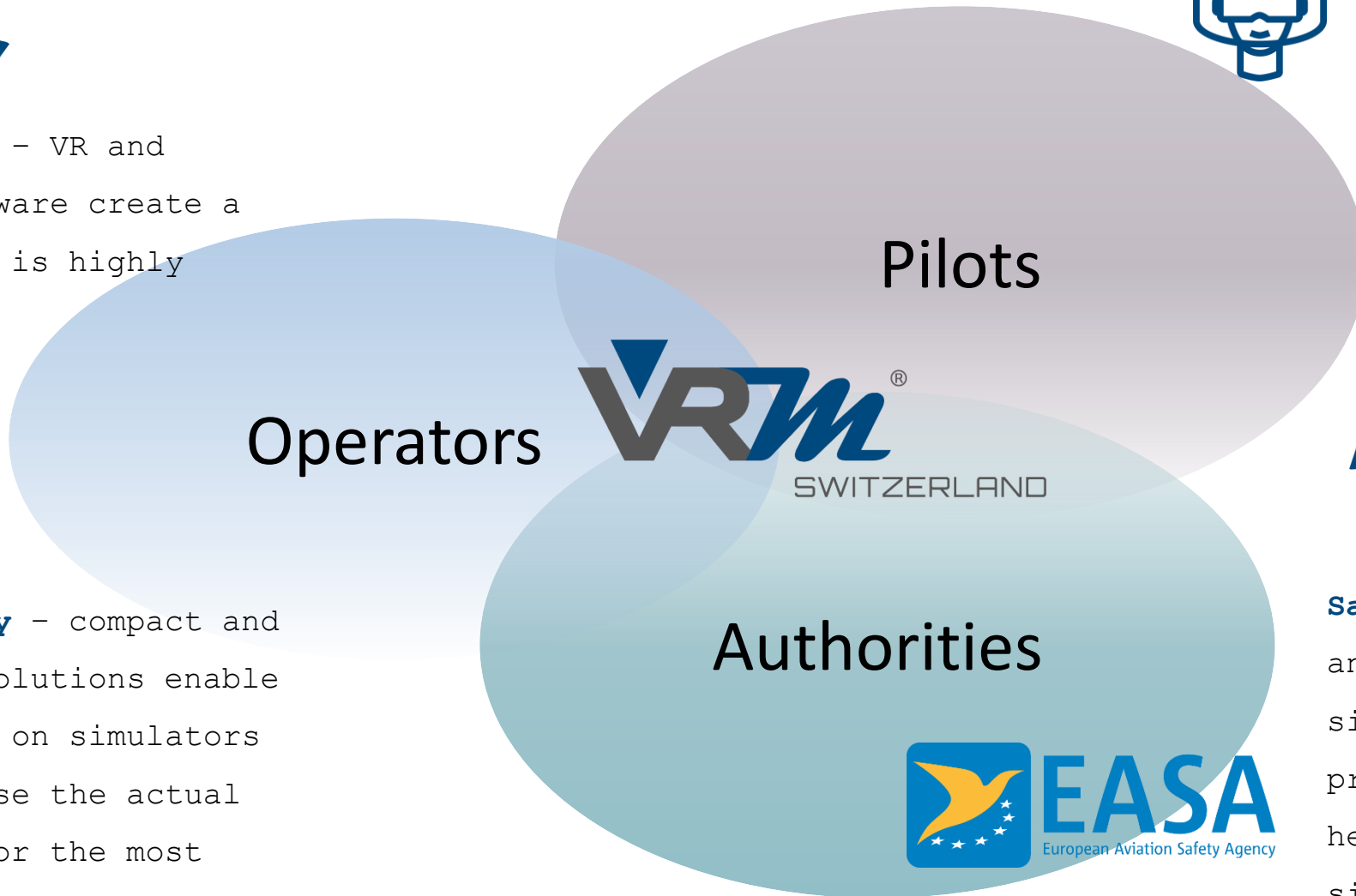
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Pilots

Operators



Authorities



