



O R Q A
Remote Reality Systems
in Space Exploration

About Orqa

Co-Founders



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Full-stack HW engineer
15+ years in product engineering



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CSO

Serial entrepreneur
Successful HW startup exit



About Orqa

Our Team



Introduction

Definitions



- **Immersive First Person View (iFPV)**: today's technology for imaging, transfer, and immersive reproduction of low-latency video, for the purpose of control and/or monitoring of remote equipment, typically remotely operated vehicles (ROVs).
- **Remote Reality (RR)**: future technology enabling immersive experience of remote real-world environments in real-time, at sufficiently low latencies to allow friction-free interactive application scenarios.

Introduction

RR vs VR



RR \neq VR

About immersive FPV

A simple example...

A drone fitted with a camera combined with video HMD that lets the pilot see the world from the drone's perspective.



FPV.One

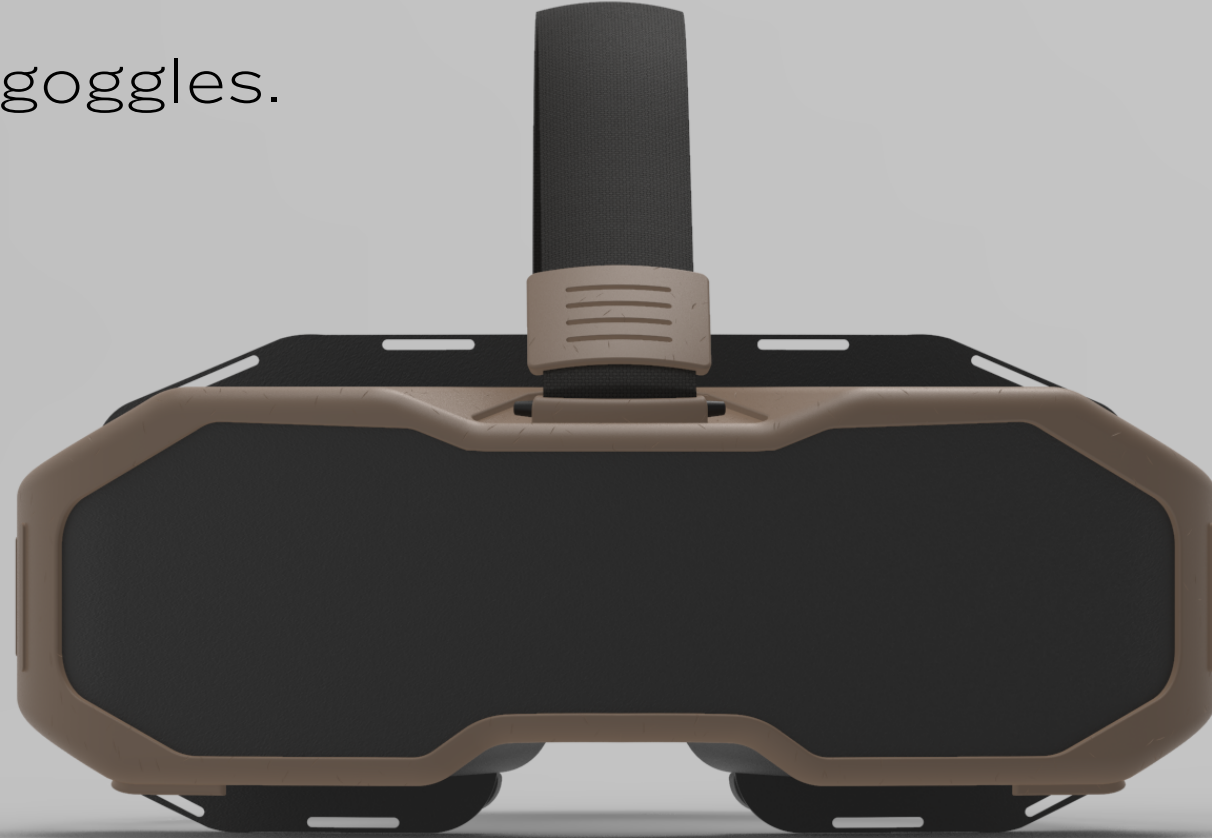
World's
best
FPV goggles.



Release date:
H1/2019

FPV.Pro

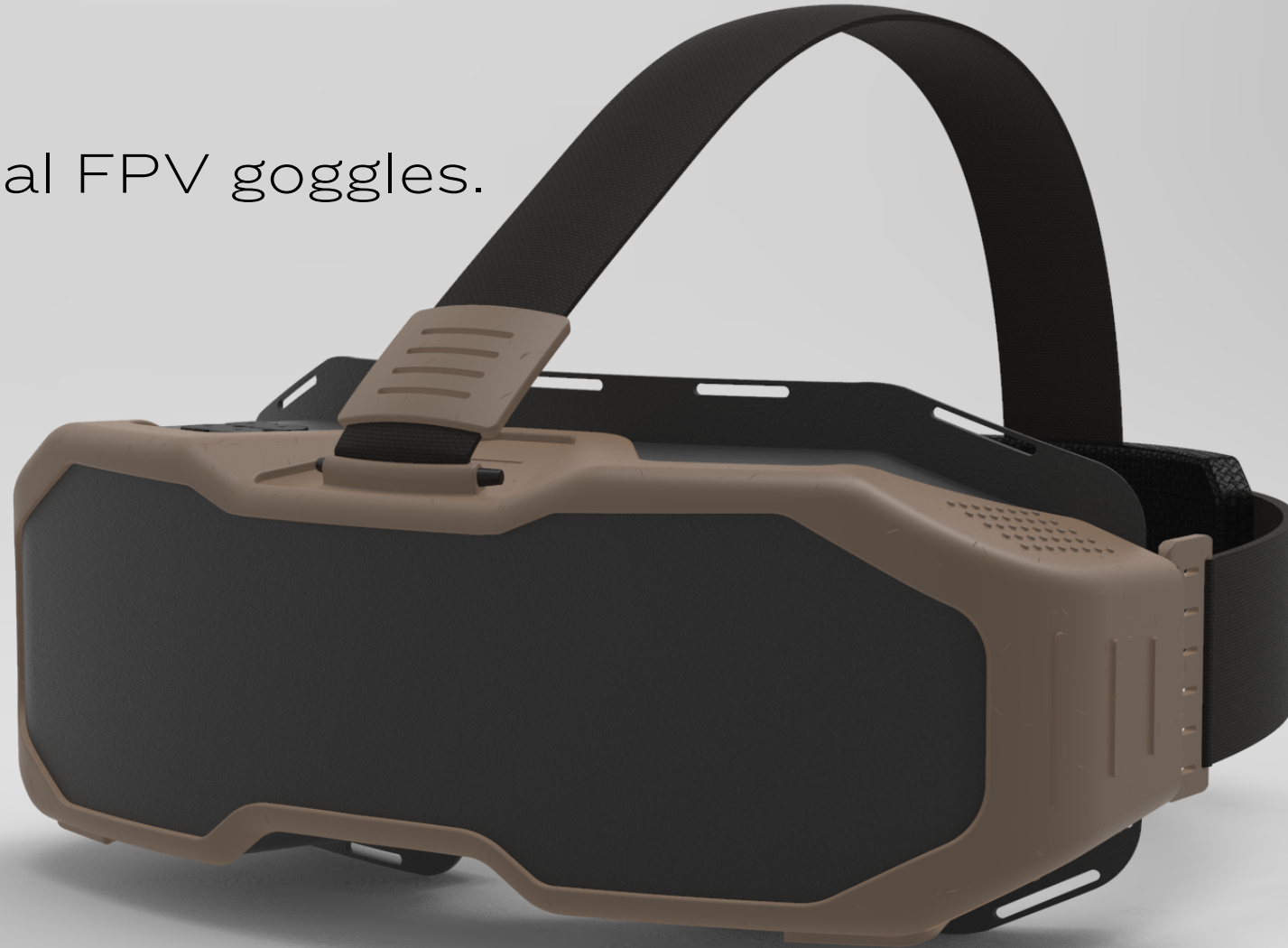
World's
first
professional FPV goggles.



Launch date:
H2/2019

FPV.Pro

World's
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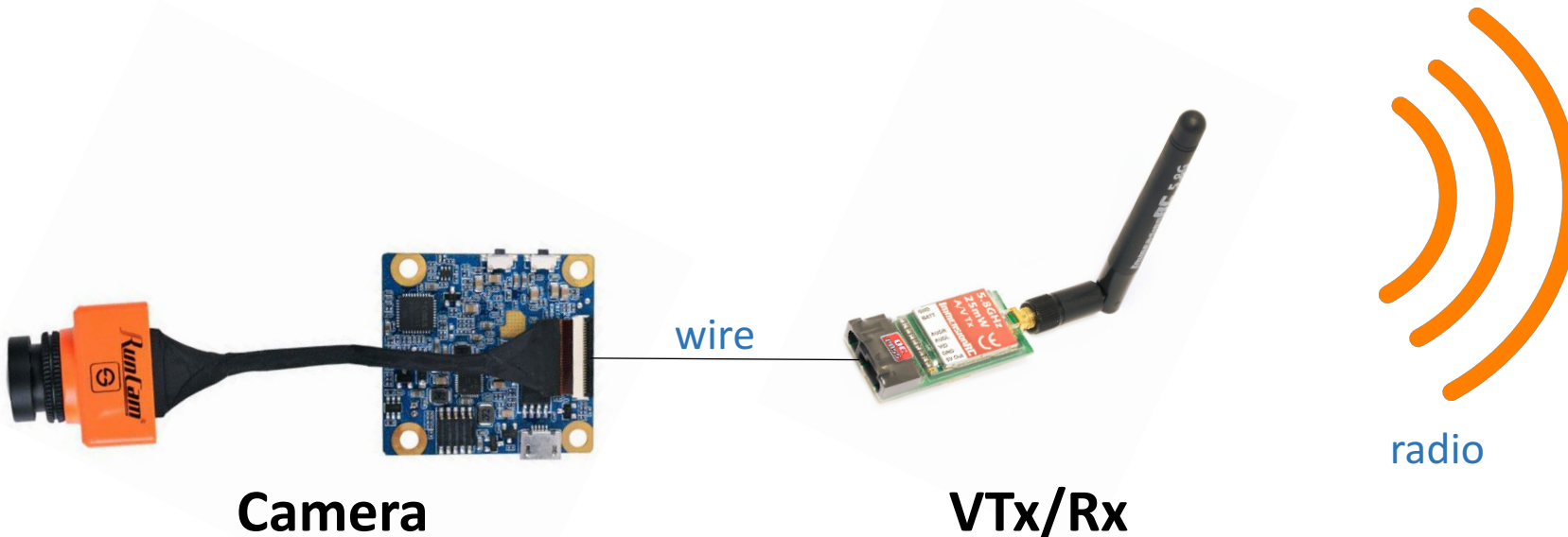


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About immersive FPV

Current technology stack



HMD

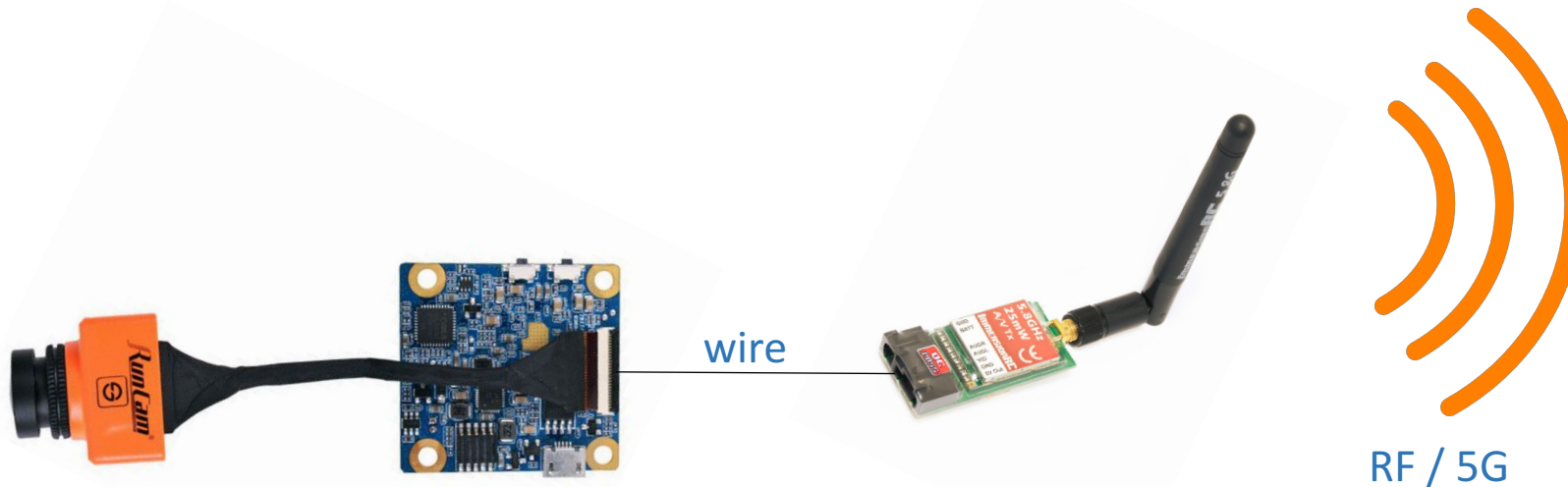
- NTSC/PAL 600TVL is the 'gold standard' for analog
- 700TVL to 1200TVL FPV cams are appearing
- accessible digital FPV solutions stop at 720p, due to VTx/Rx bottlenecks

- Currently the main bottleneck for FPV tech
- Latency is critical, which is why VTx/Rx is still mostly analog
- low-latency digital VTx/Rx still too expensive (€500+)
- For low-latency FPV, analog VTx/Rx is still the norm

- hi-res HMDs are huge
- compact goggles stop at 960x720 px

Orqa's RR innovation roadmap

How we intend to revolutionise immersive FPV



Camera

- Set 1080p as the norm for FPV
- Increase FOV
- HD stereo-vision
- Push towards 360° live video stream

VTx/Rx

- Improve analog VTx/Rx tech
- Improve low-latency digital VTx/Rx
- Push digital high-def video stream latency below 50ms
- Lighter, smaller, and less power-hungry hardware
- Plug-and-play VTx/Rx solution for RR-over-IP (RRoIP)
- Build digital VTx/Rx forward-compatible with 5G



HMD

- develop tech that will enable affordable 720p/1080p compact goggles with optimum FOV
- Maximise FOV in compact form factor

RR in Space Exploration

General considerations



- RR is the **key enabling technology** in scenarios where humans need to **remotely operate** machinery in **hazardous** and/or **hostile environments**.
- RR technology is used for **remote imaging**, transport of **video signal** and **telemetry** with **ultra-low latencies**, and **immersive near-eye display** of real-time video feed to a human operator.
- RR systems are a **superior solution** for **stereoscopic imaging** in **remote operation/manipulation** use cases.

RR in Space Exploration

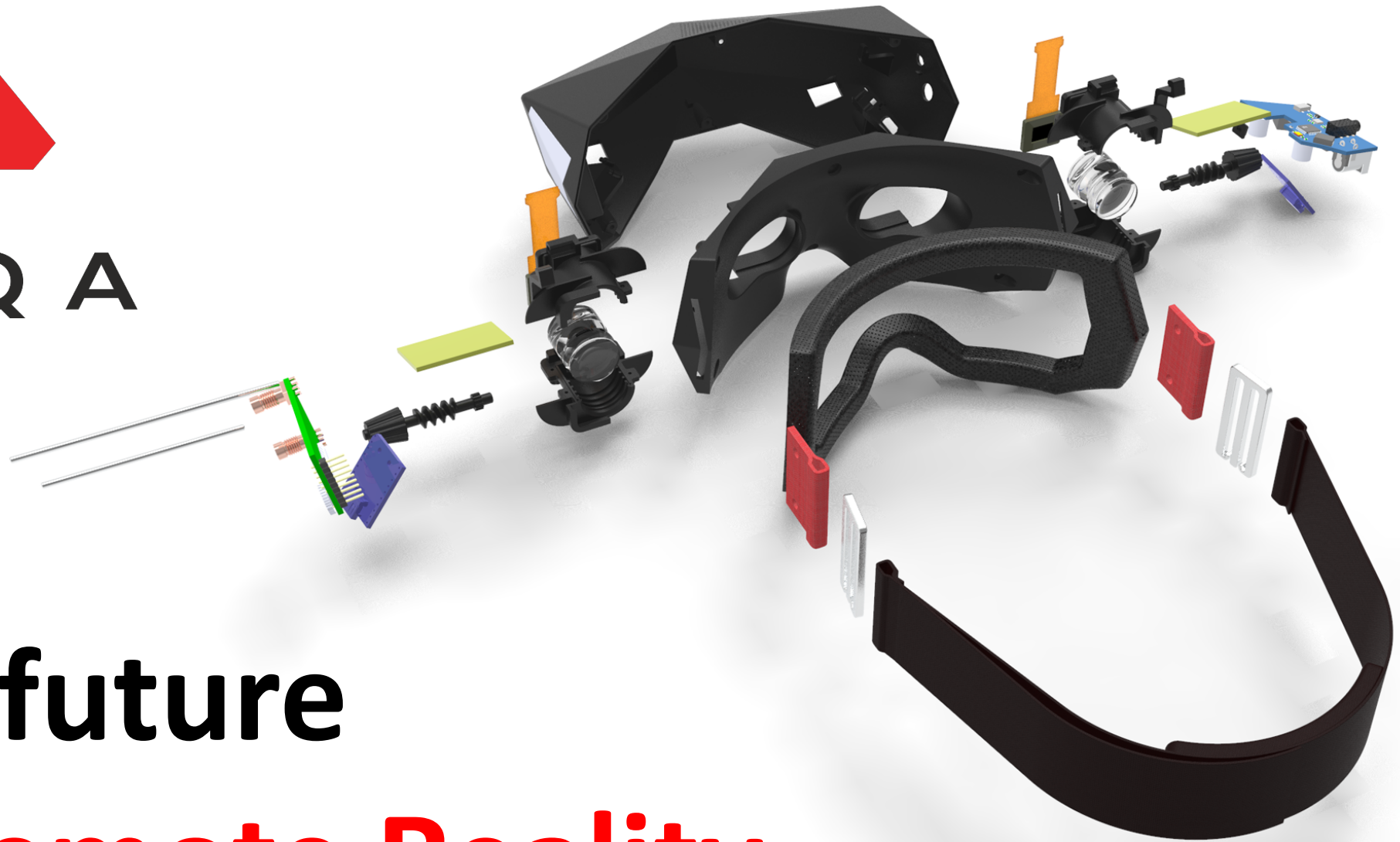
Potential uses



- RR systems could play a role in **enabling astronauts** to **remotely operate machinery** that would **replace humans in high-risk scenarios** such as space walks and landing missions.
- RR can provide **immersive experience** of **remote space environments**.



ORQA



The future of **Remote Reality**

Orqa // Remote Reality Systems in Space Exploration

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