

COGNITIVE SOCCER TRAINING



MINDSET
TECHNOLOGIES



**THINK SWIFTLY
ACT DECISIVELY
OUTPERFORM**

ABOUT US

Mindset Technologies AG

Is a Swiss company dedicated to cognitive monitoring, with an affiliate in Austria, for medical research activities.

The Company was founded by Christian Kusmitsch who did his PhD in neuroscience focusing on eye-based KPIs in human attention and Aladar Tepelea, a former Novartis manager.

Our team is based in Switzerland, Taiwan, Austria and Germany and has decades of expertise in neuroscience, machine vision and data analytics.

What we do

Project Management and One-Stop-Shop, every time Peak Performance count

By combining specialized hardware, software and patented neuroscientific algorithms, using the latest scientific methods, we get to understand how people cope with increasing mental load, internal/external stressors and sudden changes.

As “visible parts of the brain“, biologically, **eyes are ideal for cognitive monitoring.** We assess Human Factors to Optimize Safety and Performance by tracking changes in attention and perception, cognition.

These basic functions impact readiness, situational awareness and finally combat strength

What you get

- ▶ **Actionable insights with sustainable outcomes in training and assessment**
- ▶ **Real-time training performance insights in simulations, or the field**
- ▶ **A reliable system for instructors, trainers and talent scouts for talent testing and monitoring**

References



EMPOWERING NEXT-LEVEL PERFORMANCE

- **Mainstream talent development and training lacks customized tech-enabled biofeedback**
- **We help coaches to realize players' full potential in a methodological, scientific fashion, with customized NeuroTech training for each situation by identifying cognitive states and “Mind-Setpoints“**

Cognitive Soccer Training (CST) leads to*

- improved reaction time (7% faster)
- fewer errors (10% less)
- increased mental endurance (12% longer focus)

... by leveraging a combination of

- cognitive training advice
- best-in-class tracking hardware
- neuroscientific algorithms



OUR TRAINING SYSTEM - BACKGROUND

“Mental load metrics will become as important as ball possession statistics”

Christian Kusmitsch, CEO of Mindset Technologies AG



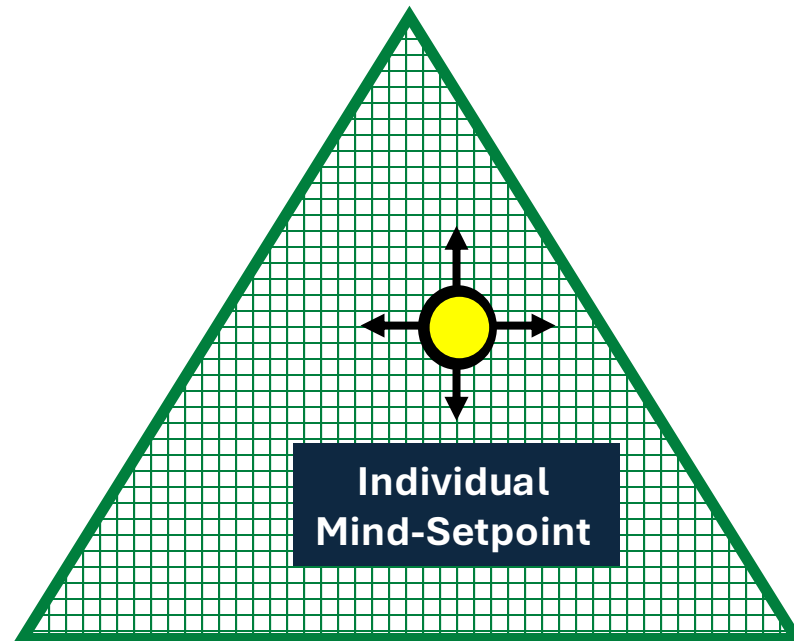
Goalkeeper



Striker



Coach



Players’ mental strength is crucial. With our solution, coaches can analyze capabilities and mental load in training.

Thus, they can provide targeted advice for improvement.

We assess the status-quo of mental elements and improve performance with actionable insights and recommendations.

Quality of visual attention is an indicator for

- visual clarity
- depth perception
- situational awareness
- tactical awareness
- anticipation
- decision making
- processing speed
- orientation in space
- mental mapping of game moves and tactics

MIND-SETPOINT: THE COGNITIVE SWEET-SPOT

1. Test



First Person View

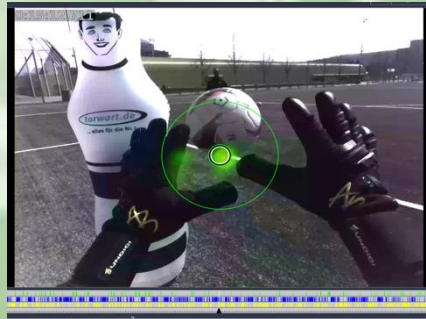
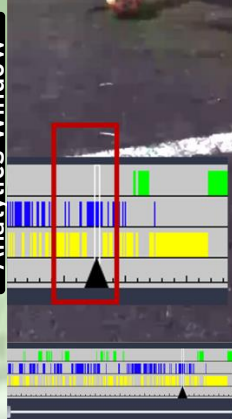


2. Debrief

Second View Camera



Analytics Window



*optional: physical and cardiac measures

1. Test

- Cognitive Soccer Training (CST) starts with a **1-hour training situation** with performance diagnostics
- **For the first session** the CST is embedded in the regular training objectives and tasks
- **Auto-calibrating VPS19 glasses** are applied and are ready in seconds. They **record eye movements/psychophysiological data** during this 1-hour training.
- Gaze, gaze shifts and blinks are recorded during the training session.

2. Debrief

- In a **de-brief session** of 1-2 hours the first-person view analytics and cognitive markers are discussed with the trainer and players
- The impact of **cognitive processing and mindset** in the given situations is **explained**

3. Improve

- **Conclusions** from the debriefing session are drawn
- A **training plan** addressing these mental strengths and weaknesses is **designed**
- **Soft or hard targets** are set (training time or key performance indicators)
- **Individual elements** of training are adjusted accordingly

4. Embed

- The regular soccer training routine is supported by Cognitive Soccer Training as a recurring, **embedded standard procedure**. Unlike physical fitness tests, they require little effort
- Depending on the nature of the aspired improvement, the CST is performed at **minimum quarterly, ideally, every month**



BENEFITS & RESULTS

Special Talents & Specific Skills Development

Proactive management of defence and faster, appropriate reactions and actions in any situation, via:

- Smooth visual pursuit, leading to better anticipation of ball trajectories
- Quiet-eye technique in standard situations (e.g., gaze at the right body parts/points for detecting moves and directions in penalties)
- Improved startle-stress response control, faster motor action under high mental load
- Raises self-confidence in tricky, stressful situations



Goalkeepers

- Smooth visual pursuit, leading to better anticipation of ball trajectories
- Better shot accuracy through higher attentional and visual focus
- Better recall of motoric patterns leading to faster reaction times
- Faster response to opportunities due to active management of alertness, arousal and focus, applicable in seconds / minutes / hours
- Raises self-confidence in tricky, stressful situations



Strikers

- Additional perspectives of game-flow and moves through first-person view and field-view cameras
- Convey new ways to train strengths and hidden talents
- Eliminate mistakes and career-limiting weaknesses



Trainers and Coaches

Levers:



Visual Capability



Processing



Tactics & Strategies



Confidence

GENERATING A REALISTIC COMPETITION EXPERIENCE

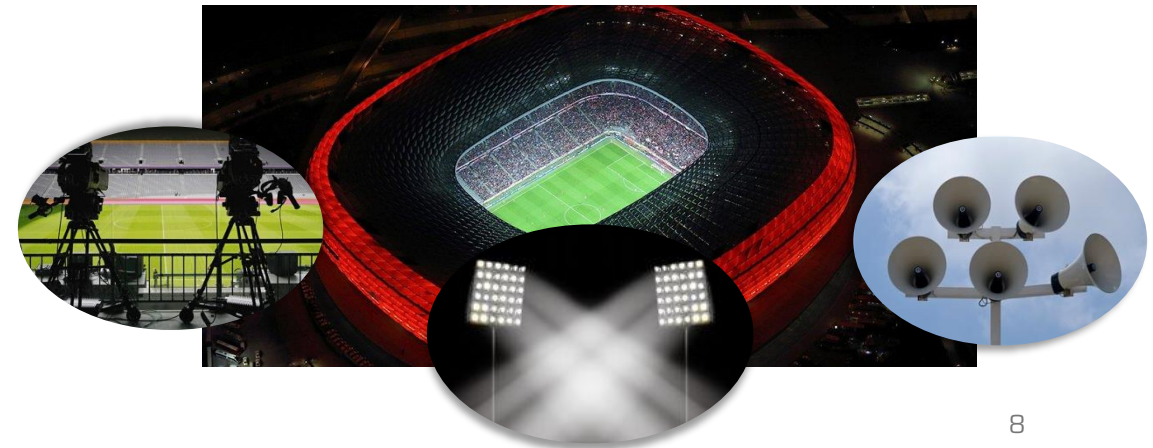
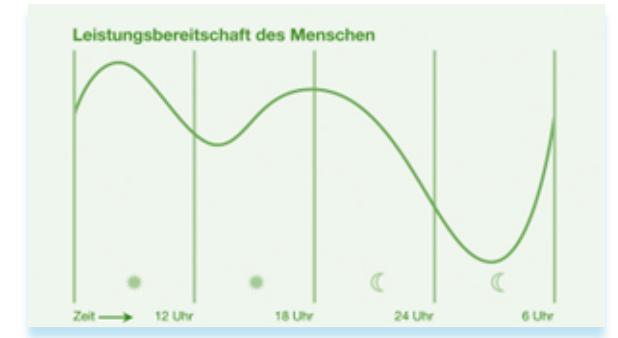
Stress levels, excitement and emotional response have major influence on athletic performance.

For improved mental performance, we replicate the match environment, atmosphere and mood to train the retrieval of cognitive resources under aggravated conditions.

To create a match-like experience, we use

- soundscape
- lighting conditions/floodlights
- special effects
- time of day/alignment with circadian rhythm

Component 1 TIME & TIMEING



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Cognitive Soccer Training: Contact Us

MINDSET
TECHNOLOGIES

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TANGIBLE RESULTS DERIVED FROM EYE ACTIVITY

The object (of danger) is hidden, our goalkeeper invests cognitive capacity, which is reflected in

- Saccades
- Reduced blinking (no time for having eyes closed)
- Fixations on critical points

Blinks and variations of their frequency indicate windows of attention, their / closure

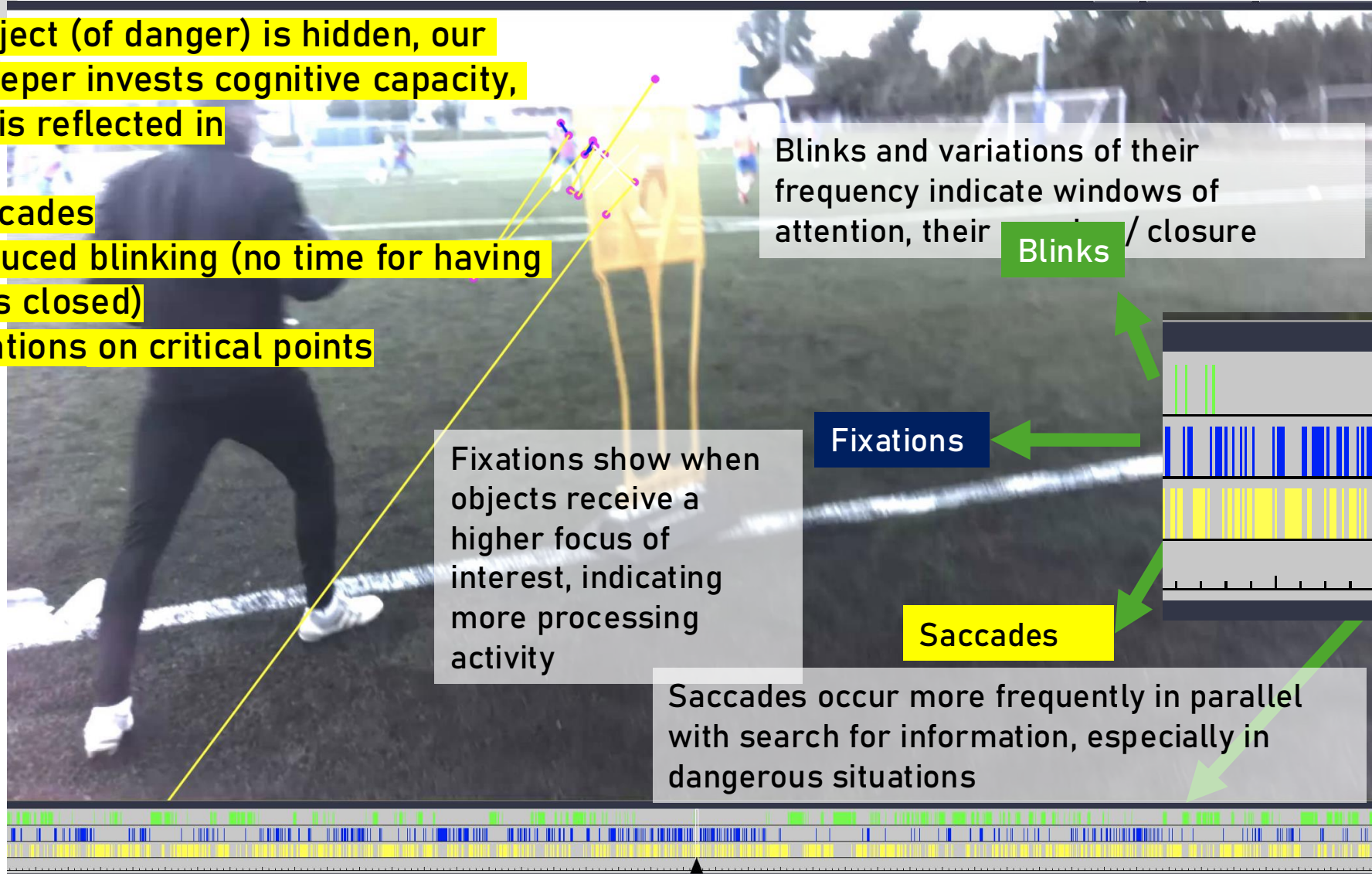
Blinks

Fixations show when objects receive a higher focus of interest, indicating more processing activity

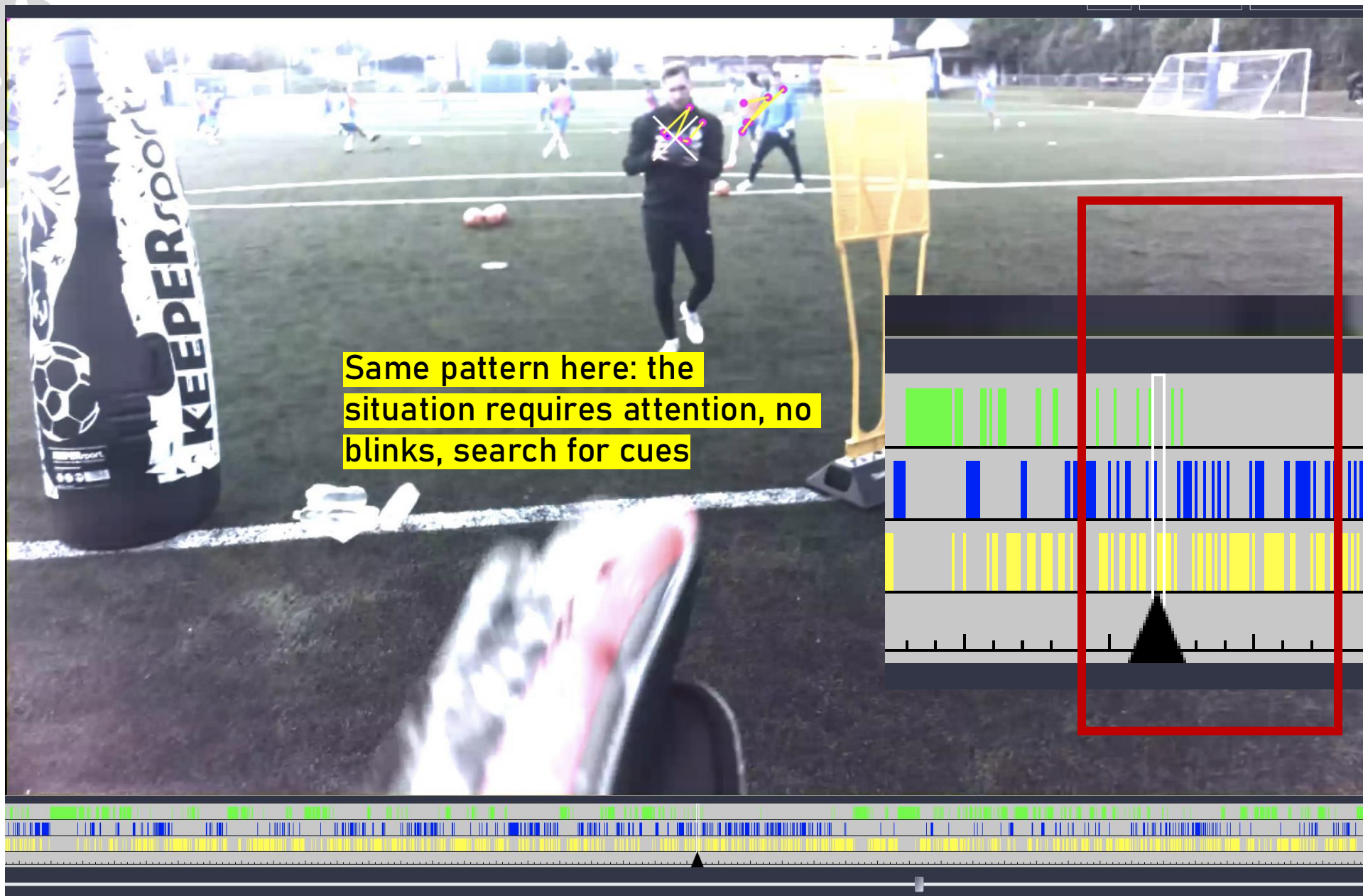
Fixations

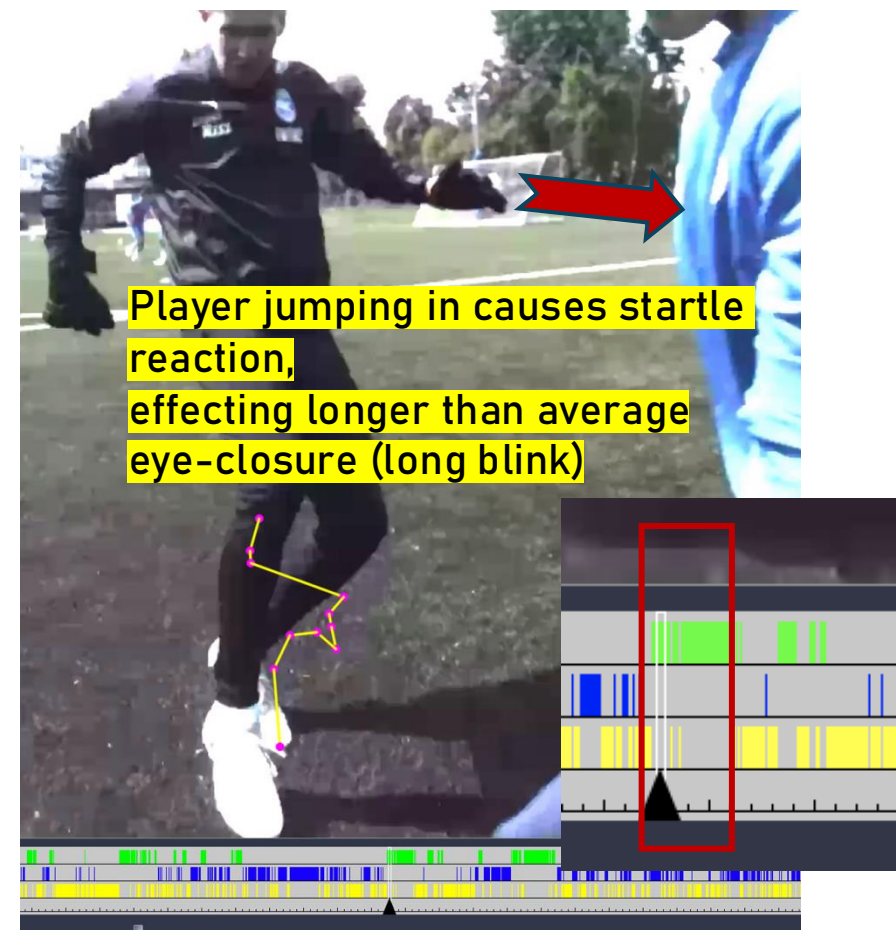
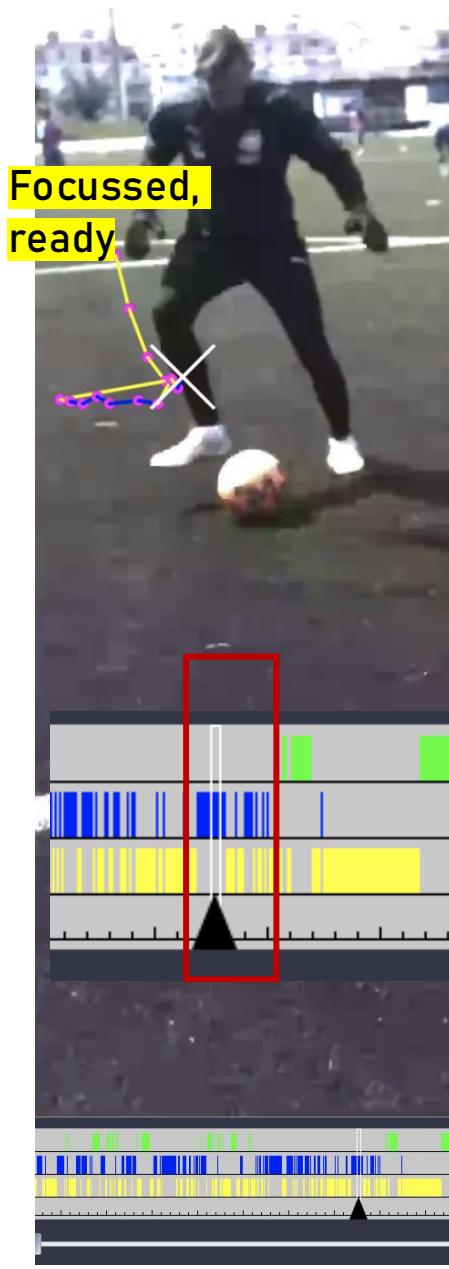
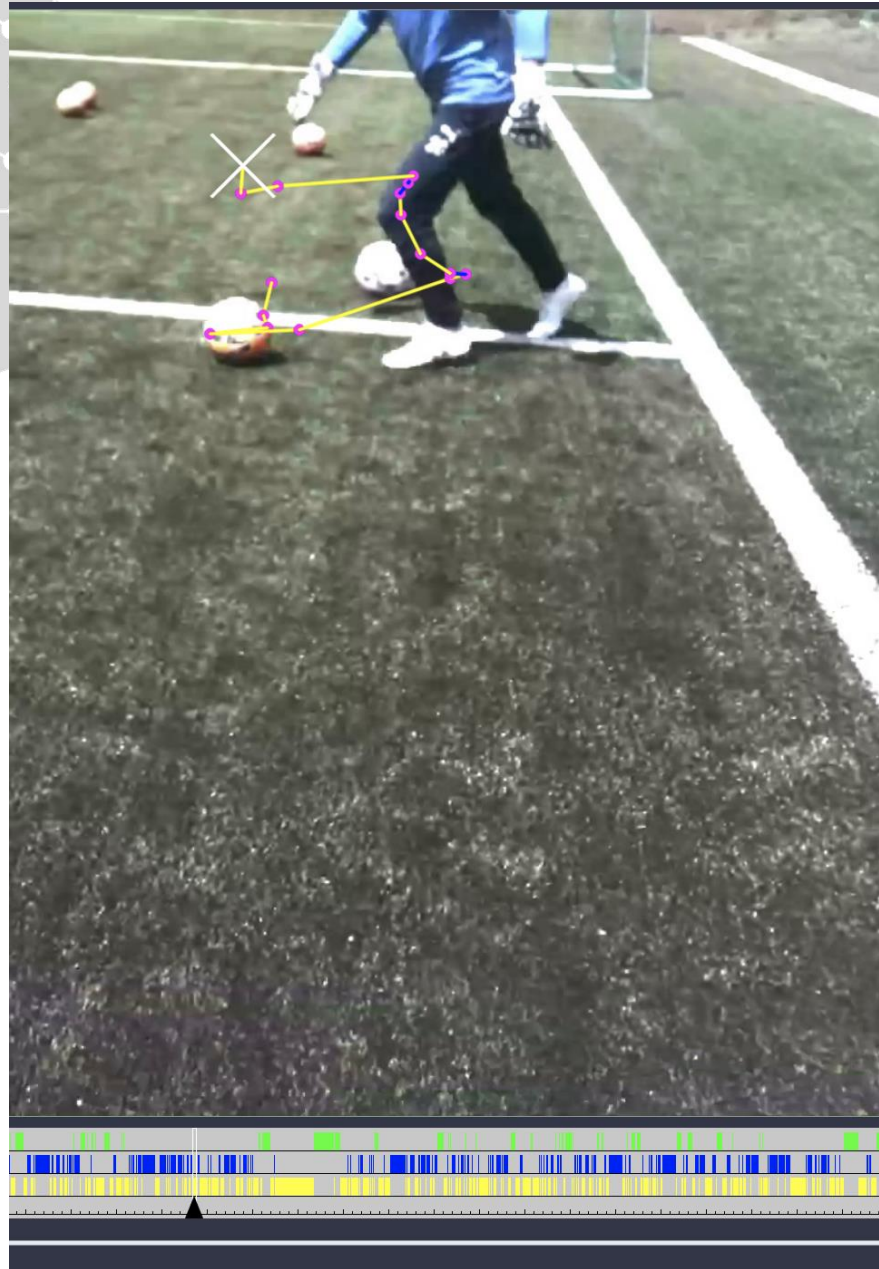
Saccades

Saccades occur more frequently in parallel with search for information, especially in dangerous situations



TANGIBLE RESULTS DERIVED FROM EYE-ACTIVITY





Player jumping in causes startle
reaction,
effecting longer than average
eye-closure (long blink)

Empowerment - skill replaces drill

- Optimized learning and retrieval: our tech-driven biofeedback increases awareness
- Skills engage
- Less miscommunication: voice-line between goalkeeper and coach integrated into our hardware

Internalisation guarantees the highest performance

Our cognitive training enables players to make effective behaviours second nature, reducing the cognitive processing involved, and delivering high performance in an “automated” way. High-level motor neuron activation enhances power and speed.

Real-life conditions create preparedness

Cognitive / stress factors are equally important to physical fitness; hence we create a match-like atmosphere during training, whenever possible. Revoking top performance in the match is easier when training takes place in similar conditions.

OUR EXPERTS



TEAMLEADER SOCCER
Raimund Bachhofer

40 years of soccer experience at Austrian national and regional level, both as player and coach.



EXPERIENCE DIRECTOR
Günther Grassl

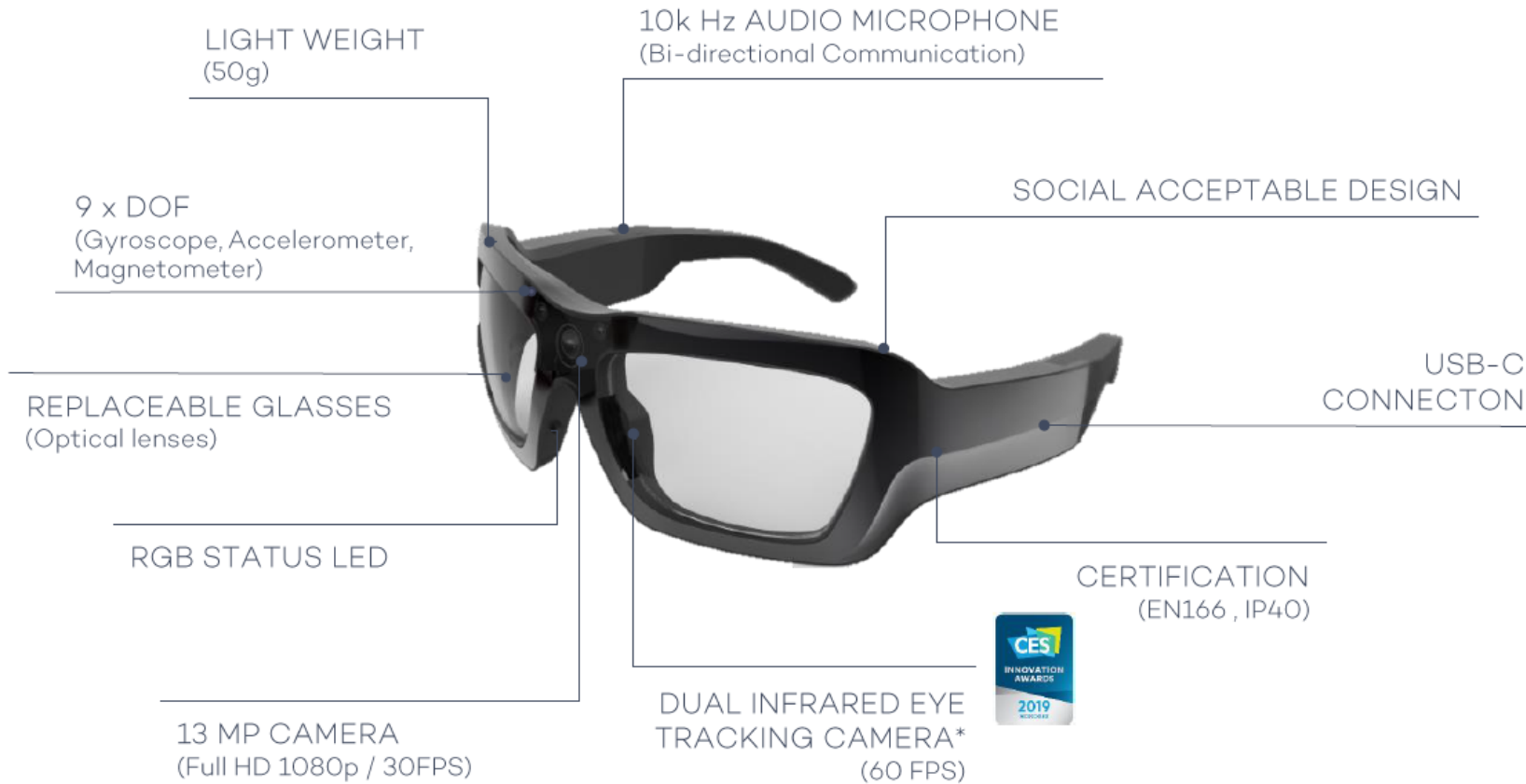
40+ years of media production experience in demanding environments such as ski races, cultural venues and high-risk sites.



NEUROSCIENCE EXPERT
Christian Kusmitsch, PhD

Conducted neuroscientific research in Vienna and San Diego, focusing on attention monitoring and performance enhancement

EYE-HYPER TRACKING GLASSES FACTS



**VIEW
POINT
SYSTEM**
MAKING FUTURE REALITY



VPS LITE UNIT
FÜR TRAINING & SIMULATION

Size/Weight of Streaming **Lite** Unit:

81 x 58 x 27 mm (3.19 x 2.28 x 1.06 in)
95 g (3.35 oz)

DEPLOYING BEST-IN-CLASS HARDWARE



View Point System (VPS) is a leading augmented reality system which we leverage to track various KPIs related to gaze direction, pupil reactions and blink frequency changes. Additionally, it enables direct voice-line communication between goalkeeper and coach.



Size/Weight of **Advanced** Unit:

VPS 19 SPECIFICATIONS

WORKS IN
REAL LIFE
CONDITIONS

QUICK &
EASY
CALIBRATION

EYE TRACKING GLASSES

WEIGHT	Excluded lenses	43 grams (excluded lenses)
CONTROLS/ SENSORS	Eye Tracking Frame Rates Front Camera Status LED	Patented 2 camera video oculography system with light robustness 30, 60 fps 13 MP/Full HD (1080p) / 86° field-of-view 3x RGB leds (front outside/left eye, right eye inside)
TRACKING	IMU	9-DOF (3-axis accelerometer, magnetometer and gyroscope)
AUDIO	Microphone	Digital High-SNR SiSonic™ Microphone
CONNECTIVITY	Wired connection	USB 3 Type C

ACCESSORIES

PRESCRIPTION LENSES	-4 to +4 diopters, replaceable optical lenses
NOSEPADS	4
TEMPLES	exchangeable
BATTERY PACK	1

CERTIFICATIONS & STANDARDS

EU	European Economic Area (CE)
Eye Safety Protective Eyewear Ingress Protection	EN 62471 EN 166 "F" Impact Robustness IP40 Glasses, IP54 Smart Unit

SMART UNIT

WEIGHT		600 grams
PLATFORM	Operation System Chipset: • CPU • GPU Memory Display type	Linux NVIDIA Jetson TX2 Module ARM Cortex-A57 (quad-core) + NVIDIA Denver2 (dual-core) @2 GHz 256-core NVIDIA Pascal @ 1.3 GHz 64GB Flash memory / 8GB RAM 5" full colour touch display / Safety glass Resolution: 1280 x 720 pixel; Brightness: 400 nits
APPS		Recording, Streaming, Video Player, Photo Viewer, Camera
CONNECTIVITY	Wired connection Mobile Data WiFi Bluetooth	3x USB Type C LTE Advanced 4G+ 802.11a/b/g/n/ac 2x2 867Mbps (dual band 2.4 GHz and 5 GHz) Bluetooth 4.1
CONTROLS/ SENSORS	Front/Rear Camera Sensors Status LED Buttons	13 MP with LED flashlight Pressure, Ambient light 1x RGB 4 Physical buttons
TRACKING	GPS IMU	9-DOF (3-axis accelerometer, magnetometer and gyroscope)
AUDIO	Microphone Speaker	Digital High-SNR SiSonic™ Microphone 1 Watt integrated speaker Bluetooth headset support
BATTERY	Internal Battery Replaceable Battery	Full shift, not replaceable Capacity: 1150 mAh LiPo Hot swappable Capacity: 3350 mAh LiPo

8 HOURS
PLUS