221e∞ Intelligent Precision Sensing

MOTION PROCESSING ENGINE

Precision Matters: Ensure Your Product's Feasibility, Differentiation, and Time to Market With the Most Accurate Sensor Fusion Software

Inaccurate Sensing Is a **Disaster** for Your Product

Sensing Inaccuracies

- Wrong Orientation Estimation
- Large Drifts & Errors
- Magnetic Disturbances

Inaccuracy Jeopardizes Your Product Feasibility.

Lack of Tech Support

- Steep Learning Curve
- Long Troubleshooting & Debug
- Complex Embedded Integration

The Required Competences aren't Easy to Come by.

Effects on Your Product

- Feasibility Risks
- Lower Quality
- Longer Time to Market

You Need Top Sensor Fusion Skills, Your Schedule and Value are at Risk.

Accuracy is crucial for your Motion Sensing Product

Precision Sensor Fusion Enables Your Differentiation

- Highest accuracy for 6/9-axis IMU/AHRS
- Adaptive operating condition logic
- Superb extended Kalman filter
- Low power and footprint
- Automatic calibration

Exceptional Accuracy

Consistent Results

Focus on Your Application, We'll Handle the Tech

- Overcome highly technical challenges
- Answer all the tough questions
- Meet tight deadlines
- Customization service
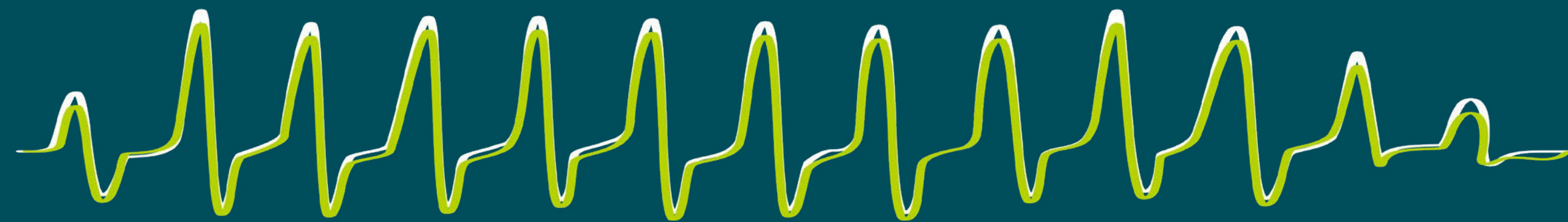- Up to 46% more cost effective

Top Notch Support

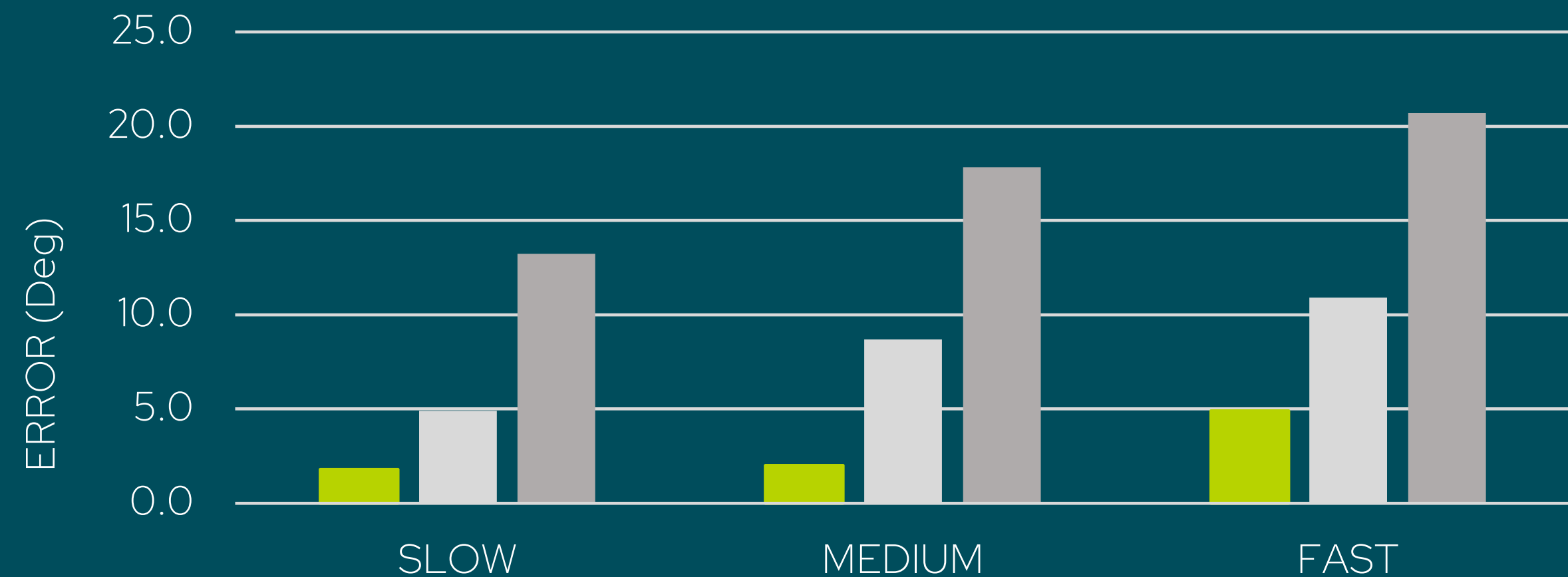Cost Advantage

Your Trusted Inertial Sensor Fusion Partner

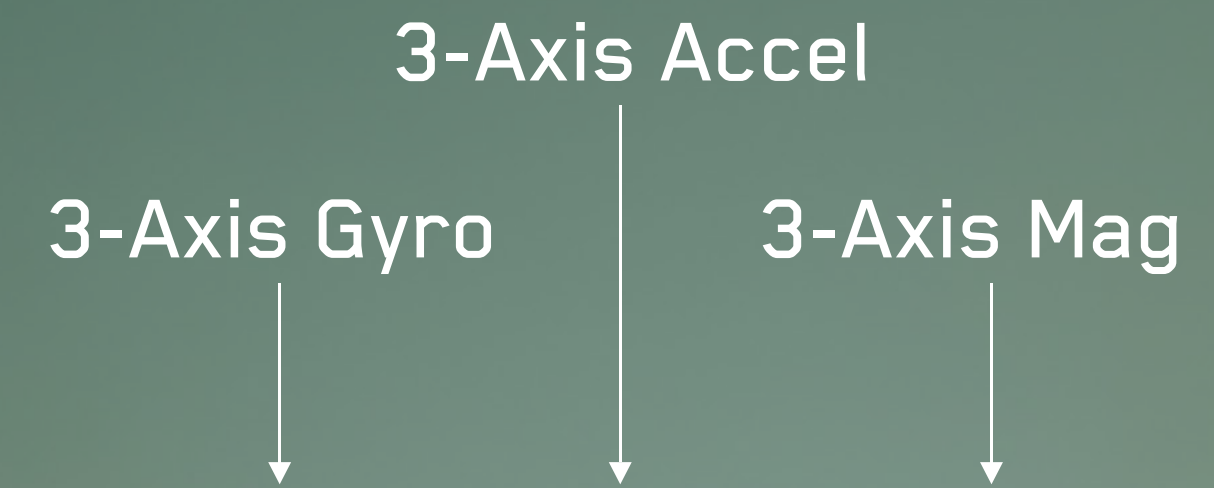# MPE™ – Motion Processing Engine

Affordable Premium Performance

■ MPE   ■ Competitor

MPE Embedded Software vs Optical Ground Truth

ERROR (Deg)

25.0
20.0
15.0
10.0
5.0
0.0

SLOW   MEDIUM   FAST

■ MPE   ■ Competitor   ■ Open Source

IMU Performance Benchmarks: MPE vs Competitors
(The lower the better!)

3-Axis Accel

3-Axis Gyro   3-Axis Mag

Sensor Fusion

Attitude

Roll   Pitch   Yaw

Originally designed for life-saving applications with zero room for error,
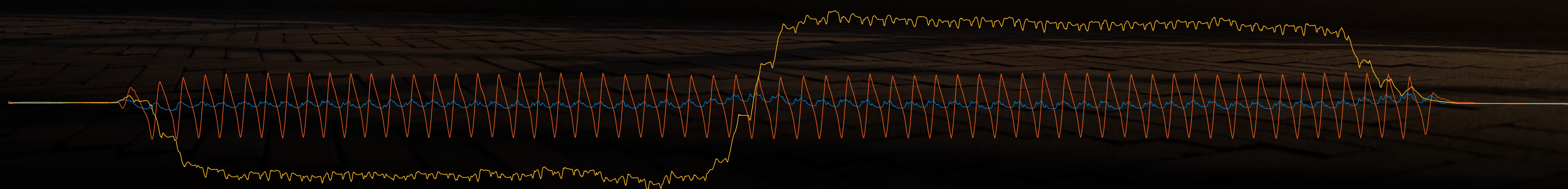MPE delivers the highest accuracy for any motion-sensing product

Humans in Motion

Leverage IMU sensor data & sensor fusion software for detailed motion analysis in sports and fitness.
MPE enhances tracking precision, providing valuable insights that support improved athletic performance.
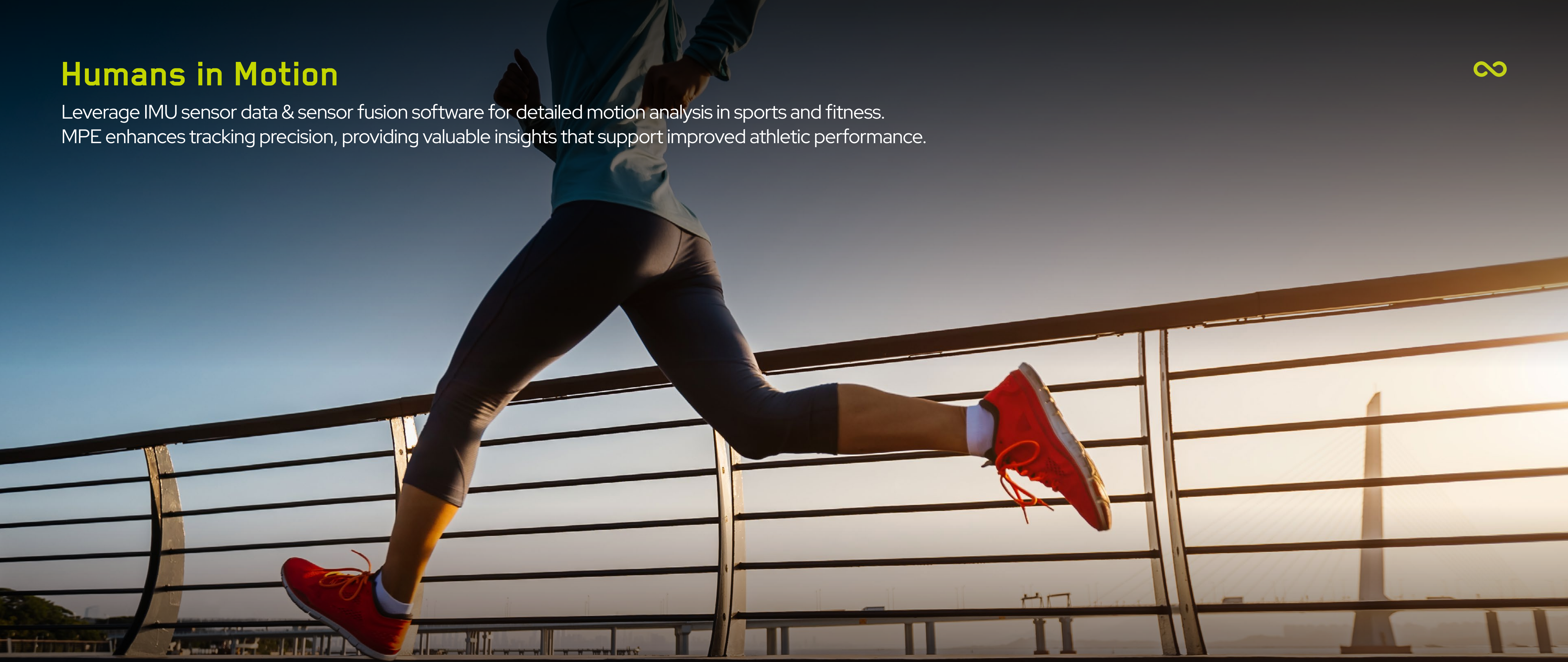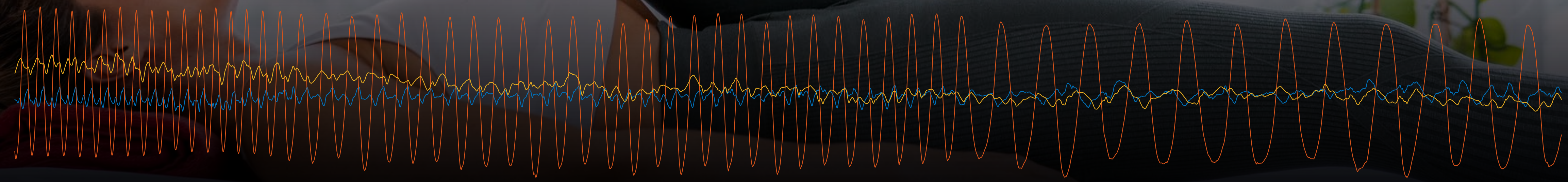
Roll
Pitch
Yaw

Humans in Motion

MPE, combined with IMU data, enables comprehensive analysis of patients' movement metrics such as gait, posture and overall mobility. This synergy provides decisive insights for enhanced patient monitoring and better rehabilitation results.

Roll
Pitch
Yaw

Humans in Motion

MPE delivers smooth, precise tracking of body movements, enabling a more immersive and interactive VR experience.
By capturing real-time motion and accurately aligning virtual actions with physical ones, it significantly enhances realism in virtual environments.

Roll
Pitch
Yaw

Things in Motion

Enhances robotic perception through real-time sensor fusion and analytics, improving operational accuracy.
Data provided by MPE about motion patterns serve as the foundation for continuous monitoring, safeguarding equipment and reducing downtime.

Roll
Pitch
Yaw

Things in Motion

Advanced sensing capabilities driven by integrating real-time data from multiple sensors.
MPE delivers insights that enhance vehicle safety, optimize driving performance, and support critical systems such as stability control and autonomous driving.
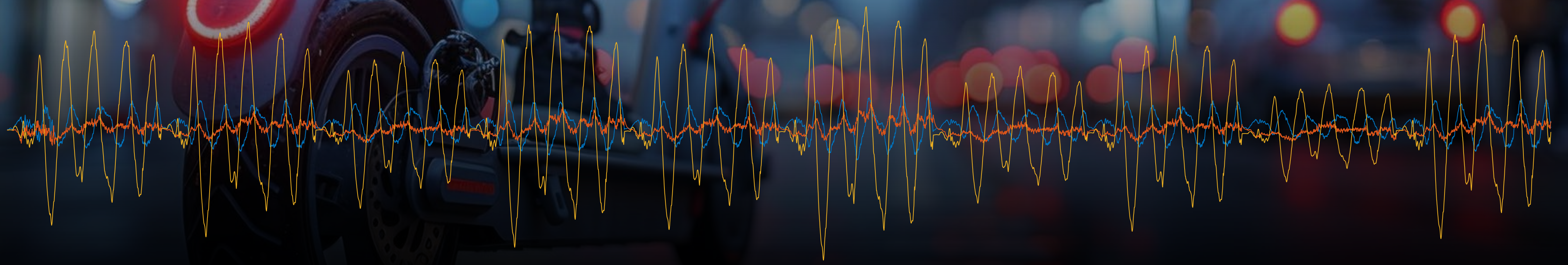
Roll

Pitch

Yaw

Things in Motion

Enhances rider safety by processing real-time sensor data for advanced collision detection and impact monitoring.
MPE creates a cohesive and precise understanding of motion & position, that is leveraged to optimize safety features.

Roll
Pitch
Yaw

MPE™ – Motion Processing Engine

∞

Performance – Superior robustness, accuracy and repeatability for any motion-sensing product.
Versatility – Developed for a wide range of applications, available as a software library license.
Ease of integration – Effortless implementation for smooth deployment in any environment.
Optimization – Engineered to run on low-power devices without compromising precision.

MPE_SetSamplingTime	Define the sampling frequency of data sampled.
MPE_SetGyroscopeNoiseThreshold	Initialize and compute gyroscope bias.
MPE_SetAXLCalibrationParameters	Set scale factor and calibrate accelerometer.
MPE_SetGYRCalibrationParameters	Set scale factor and calibrate gyroscope.
MPE_SetMAGCalibrationParameters	Set scale factor and calibrate magnetometer.
MPE_Init	Set the configuration and initialize the filter parameters and internal variables.
MPE_Update_6DOF or MPE_Update_9DOF	Run the core functions of the logic to compute orientation.
MPE_GetOrientationQuaternion	Return the current orientation in quaternion form.
MPE_GetEulerAnglesFromQuaternion	Convert orientation from quaternion to Euler angles representation.

Flash memory occupation	47.7 KB
RAM memory occupation	19.9 KB
Timing [clock hits]	Average: 10278, Maximum: 10506
Timing @64MHz [ms]	Average: 0.161, Maximum: 0.164

Plug & Play – Hardware-agnostic static C library integrated with 3 lines of code

About Us

221e is a leading global supplier of intelligent precision sensing solutions for smart devices. Our hardware platforms and AI-powered sensor fusion algorithms provide exceptional accuracy and consistent results alongside significant cost advantages. Since 2012, we have delivered innovative sensing solutions to power a wide variety of products, including wearables, IoT devices and automotive applications. For over a decade of field testing and scientific research, 221e's advanced sensing technologies have been continuously refined to meet the accuracy requirements of the most demanding applications.

Company

Founded: 2012
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Experience a new standard in motion sensing accuracy and reliability.
Schedule a demo now to see how MPE can enhance your product.

SCHEDULE A DEMO

www.221e.com