



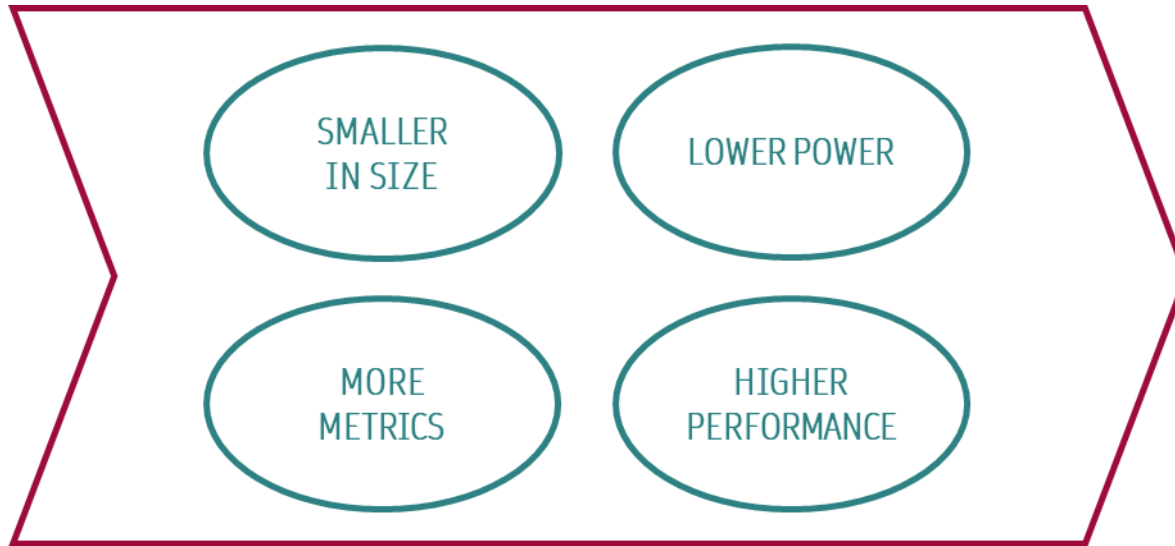
EDGE SENSING FOR INTELLIGENT ENVIRONMENTS

Eero Kaikkonen

May 2025

SENSORS – Fundamental Building Blocks for Detecting and Measuring

FUTURE TRENDS FOR SENSORS



INCREASED VALUE OF DATA

The sensor-driven data –
Essential for smarter systems
and improved performance.

- Continuous monitoring
- Automation
- Diagnostics
- Preventive insights

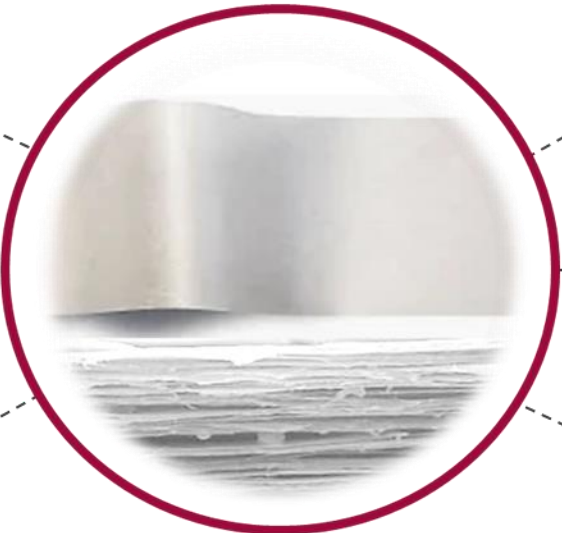
The amount of data continues to grow:

More sensors – Better sensors –
Improved sensor networks

MOVESOLE SMART SENSOR For Capturing Precise Force Data

EMFi – ELECTROMECHANICAL FILM

A high-performance
sensor material



Ultra-flexible



Highly sensitive



Exceptionally durable

Instant responds to
dynamic forces, even
the smallest changes

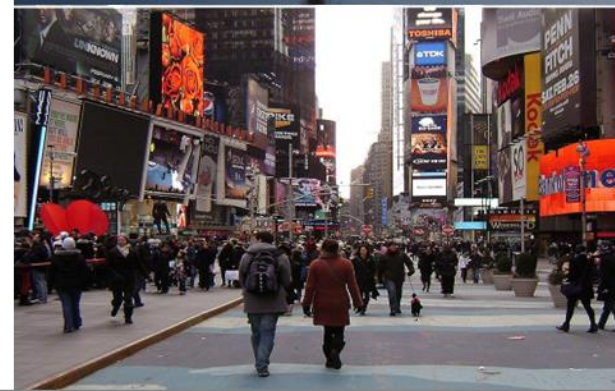


MOVESOLE SMART SENSOR

Ideal for
capturing
precise, real-time
force variations.

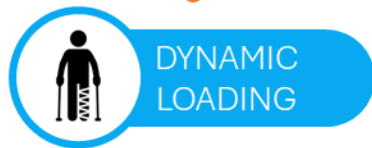
MOVESOLE VISIO – Measuring Our Natural Way To Move

Gait and move measuring out of laboratories to anywhere people live their lives.



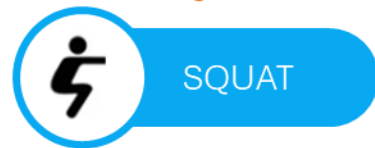
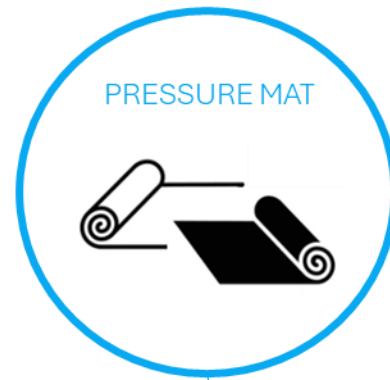
MOVESOLE PRODUCTS - Lower Limb Injury Recovery & Strength Improvement

MoveSole StepOne

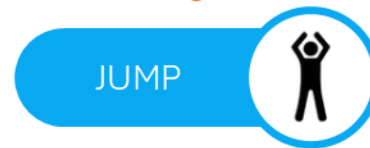


Total force load:
Load on a broken leg

MoveSole ForceProfiler

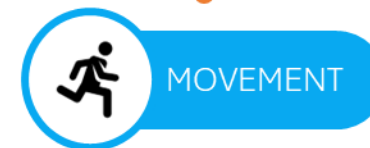
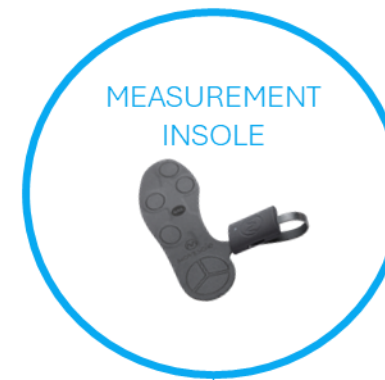


Asymmetries:
Right – Left
Pronation – Supination
Heel – Toe



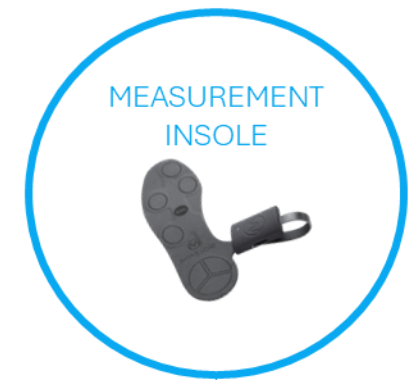
Jump Height:
Air-time

MoveSole StepLab



Force distribution under a foot:
Force distribution map

MoveSole Research



Force distribution under a foot:
Force curves / each step

MOVESOLE PRODUCTS ON PILOTS & RESEARCH PROJECTS



University of Jyväskylä | Faculty of Sport and Health Sciences



WEARABLE SENSOR TECHNOLOGIES
SENDoc



University of Applied Sciences



UNIVERSITY OF TURKU

Computer Science

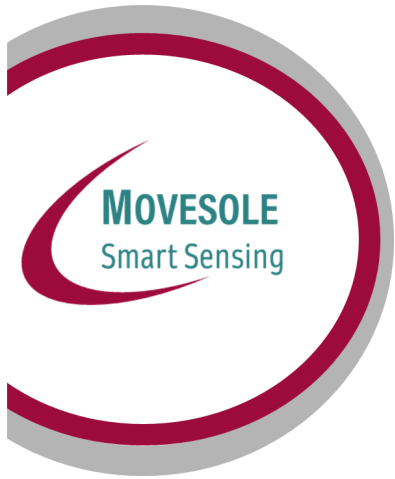


Tays



UNIVERSITY OF OULU



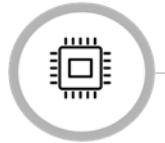


CAPABILITY TO BUILD PROTOTYPES & PRODUCTS FROM CONCEPT TO COMPLETION



UNIQUE FORCE SENSOR MATERIAL

EmFi – a thin, flexible material enabling high-accuracy force curve capture.



PRECISION ELECTRONICS DESIGN

High-quality, professionally designed electronics for demanding applications.



EXPERT PROTOTYPE / PRODUCT MANUFACTURING

Premium materials, carefully selected to ensure performance and durability.



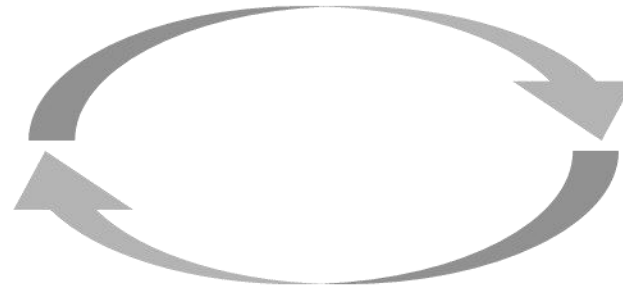
ADVANCED SOFTWARE DEVELOPMENT AND IMPLEMENTATION

From algorithms and embedded software to intuitive user interfaces – delivering relevant data for analysis and integration with applications.



MOVESOLE UNIQUE SENSOR TECHNOLOGY – From Human Wellbeing Monitoring to Machine Wellbeing Monitoring

HUMAN GAIT & MOVEMENTS



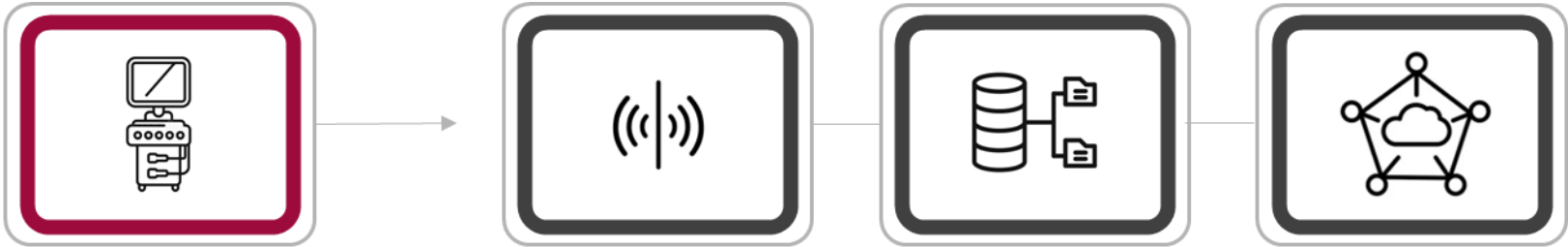
MACHINERY VIBRATIONS



EDGE SENSING – Data and Control Closer to the Data Source

Edge sensing architecture supports **secure closed environments** -

- Boosting safety
- Enhancing performance and functionality
- Minimizing production delays



DATA SOURCES

The sources are almost endless:
Devices
Machines
People.

SENSORS

Force sensors, in particular, detect and respond to changes:
Movement
Pressure
Vibration.

STORAGE

Short term data storage:
Notifications
Warnings
Error messages.

EDGE COMPUTING

Algorithms and data analytics.
Real-time data processing.

THE ROLE OF SENSORS TOWARDS INTELLIGENT ENVIRONMENTS

01

Measurement

Sensors detect individual parameters.

02

Diagnostic

Combined data from a wide range of sensors provides actionable insights.

2025

03

Predictive

Sensor-based insights are modelled to forecast future device and system performance, with a focus on relevant data.

04

Prescriptive

Predictive insights are used to proactively guide operations. Edge computing enables automated, real-time decision-making.

**THANK
YOU**



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