

FIBER OPTICAL SENSOR SYSTEMS IN SPORTS MEDICINE



AT A GLANCE

Fiber optical sensor system for contact pressure monitoring in sports medicine or orthopedics

Wireless interface to wearables like smartwatches

Battery-powered standalone solution

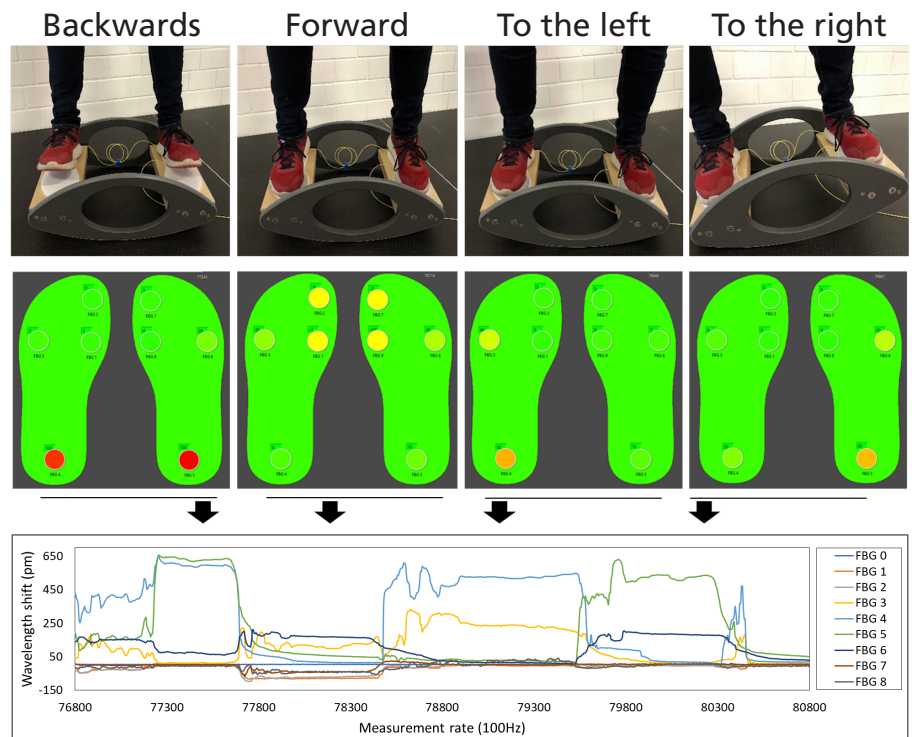
Features

- Fiber optical sensor platform with integrated readout unit for contact pressure monitoring in sports medicine or orthopedics
- Realisation of smart clothes and shoes
- Real-time data evaluation
- Wireless interface to wearables like smartwatches or mobile phones
- Battery-powered standalone solution

Technical Background

The fiber optical sensor system consists of several contact pressure sensors and a compact readout unit, all based on fiber Bragg grating (FBG) technology processed by femtosecond laser writing technology. A wireless interface enables the communication and evaluation of sensor data by tablet pc, smartwatch, or medical actuator cuff in real-time. In sports, an acoustical, optical, or vibrational alarm can instantly be triggered to warn the athlete, if the preset load limit is exceeded.

For medical/orthopedic use, long-term monitoring of the local pressure loads in the shoes during daily motion routines of patients are of interest. Based on these data the shoes and motion behaviour of persons can be optimized.



Applications

- Monitoring and digitalization of local pressure loads during sport activities such as skiing, walking or jogging
- Tailor-made shoes based on the evaluation of contact pressure data
- Usage for long-term monitoring in orthopedics
- Triggering alarm chain to warn the athlete, if the preset load limit is exceeded
- Optimization of motion behaviour of persons

Specifications

- Real-time contact pressure sensors (up to 100 Hz)
- Highly accurate pressure sensor with linear sensor dynamic range (0-2000 N)
- Integrated temperature sensor (-20°C to 75°C)
- Wireless interface (Wi-Fi/Bluetooth)
- Battery-powered
- Data acquisition, evaluation, and recording by smartwatches or mobile phones

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