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## Press-Release

### **IIT (ISM) Dhanbad Researchers Conduct Health Outreach at Bokaro Mines; Publish Two Papers in IEEE Sensors Journal**

Professor **Sanjeev Kumar Raghuvanshi** and his research team from the **Department of Electronics Engineering, IIT (ISM) Dhanbad**, recently organized a **health outreach program** at the **Khas Mahal coal mines, Bokaro**, as part of their ongoing efforts to translate academic research into real-world impact.

During the visit, the team interacted with mine workers and conducted on-site **health assessments** using an **indigenously developed mobile-based ECG measurement system**, designed and built in the department's laboratory. Several workers' ECGs were recorded and analyzed on-site, with **instant reports shared on their mobile devices**.

This initiative reflects the department's strong commitment to **developing low-cost, portable medical technologies** that enhance the health and well-being of industrial and field workers, aligning innovation with social responsibility and community engagement.

Further strengthening their research credentials, **Prof. Raghuvanshi and his team have recently published two significant papers** in the *IEEE Sensors Journal*, a reputed international publication of the **Institute of Electrical and Electronics Engineers (IEEE)**.

The first paper, titled "**Microwave Photonic Filter for Fiber Optic Sensing Applications: A Review**", authored by **Ritesh Kumar, Pankaj Kumar Singh, Sanjeev Kumar Raghuvanshi, and Santosh Kumar**, presents an extensive study on **microwave photonic filters (MPFs)** used in fiber optic sensing and measurement. The paper explores MPF classifications, reconfigurability, aerospace applications, and challenges, while also examining advanced detection techniques like coherent and heterodyne detection, phase noise analysis, and dynamic range evaluation.

The second paper, titled "**Heart Rate Variability as a Non-Invasive Sensor for Acute Mental Stress and Cardiac Abnormalities: Comparative Study**", co-authored by **Azhar Shadab, Purnendu Shekhar Pandey, Sanjeev Kumar Raghuvanshi, Shashank Awasthi, and Santosh Kumar**, explores **heart rate variability (HRV)** as a non-invasive and effective indicator for detecting **acute mental stress and cardiac abnormalities**. The study compares ECG data from normal and arrhythmia-affected individuals, demonstrating HRV's potential for **real-time stress and cardiac monitoring**.

IIT (ISM) Dhanbad **congratulates Prof. Sanjeev Kumar Raghuvanshi and his research team** for their continued commitment to **advancing sensor technologies** and **developing innovative, affordable solutions** for diverse real-world challenges.

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