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BOOK OF ABSTRACTS

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T H E M E 12: FOCAL THEME: APPLICATIONS OF EMERGING TECHNOLOGIES INCLUDING AI/ML IN SUSTAINABLE DEVELOPMENT

biometric inputs, our approach captures a comprehensive behavioral profile of individuals. Gait data focus on features such as stride length, variability, and cadence, while keystroke patterns are analyzed for timing irregularities and motor control precision. Advanced machine learning algorithms are employed to classify patterns linked to Parkinson's disease with high accuracy. Preliminary results indicate that the integration of gait and keystroke dynamics improves diagnostic precision over traditional gait-only methods. This framework offers a non-invasive, scalable solution for early detection of Parkinson's disease, with potential applications in both clinical and remote settings. Our research highlights the promise of multimodal biometrics in advancing PD diagnostics and paves the way for future developments in digital health technologies.

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AI-Enabled NPK Sensor System for Precision Floriculture

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The soil nutrient management is crucial for optimal plant growth and yields in floriculture. The growth and productivity of flowering plants are substantially influenced by essential soil nutrients like Nitrogen (N), Phosphorus (P), and Potassium (K). The NPK (Nitrogen-Phosphorus-Potassium) ratio is diverse for various flowering plants. The ideal NPK ratio depends on the specific nutrient needs of the plant species, its growth stage, and soil conditions. The Marigolds, Petunias, and Zinnias require NPK ratio of 10-20-10 whereas the Roses, Peonies, and Daylilies require a 5-10-5. The conventional soil testing methods for monitoring NPK values are labour dependent, time-consuming, and lack real-time metrics. The present study proposes a novel approach using Artificial Intelligence (AI) and the Internet of Things (IoT) to monitor and control soil NPK levels in floriculture. The objective is to continuously measure soil parameters, i.e. NPK value, moisture content, and pH of different cultivating beds by integrating IoT-enabled sensors with AI algorithms. The real-time data is collected by the IOT-enabled sensors from the cultivating beds comprising different flowering plants and subsequently, data is transmitted to a centralized cloud platform. Models based on machine learning are implemented by AI to analyze the stored data and propose practical recommendations for the NPK ratio. The AI-enabled sensor system can forecast soil nutrient deficiencies and propose the measure of fertilizer usage. This method additionally improves nutrient management mitigates the excessive use of fertilizers, thereby promoting sustainable floriculture practices in precise agriculture.

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A Comparative Study of Multi-Criteria Decision-Making Model and Bivariate for Landslide Susceptibility Zonation of Khawzawl District of Mizoram, Northeast India

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Landslide is a serious issue in the northeastern state of India owing to unique lithological structures and extreme rainfall. The Khawzawl district of Mizoram is a newly established district facing rainfall-induced shallow landslide during monsoon causing extreme environmental degradation, economic loss and life losses. Hence, the study aimed to zonation of the district based on landslide susceptibility (LM) by Analytical Hierarchy Process (AHP) and Information value (IoV) incorporating twelve landslide conditioning factors. Under the consistency ratio of 0.06, the maximum weightage was assigned to normalized difference vegetation index (NDVI), Dist. to roads (DTR), Dist. to lineaments (DTL), and slope. The spatial distribution of landslide susceptibility zones map confirmed that high and very high susceptibility zones were located along the roads by both of the models. As an aerial distribution, very high susceptibility covered by 10.33% and 13.53% according to the AHP and IoV models respectively. The root mean square error of AHP and IoV were 0.3 and 0.33 respectively indicating an accepted level. Furthermore, the predictive rates of AHP and IV