**In God's name**

**Abstracts of articles**

1. **Infrastructure-Wide and Intent-Based Networking Dataset for 5G-and-beyond AI-Driven Autonomous Networks**

This paper introduces the IW-IB-5GNET dataset designed to support research and development of intent-based autonomous networking in 5G and beyond. It argues the need for comprehensive, infrastructure-wide data spanning radio access, core layers, signaling events, operational logs, and QoS metrics to train machine learning and reinforcement learning models for network automation. The dataset structure, preprocessing pipelines, and labeling conventions are detailed to ensure usability for tasks such as anomaly detection, traffic prediction, and autonomous resource configuration. Experimental use cases demonstrate benchmark results for example models and define evaluation metrics relevant to intent fulfillment and operational robustness. Strengths include broad infrastructure coverage and public availability; limitations noted are the need for continuous updates to reflect operational changes and privacy/commercial concerns when sharing real-world traces. The paper concludes by positioning IW-IB-5GNET as a practical foundation for autonomous network research and suggests future work on multi-source fusion and dataset standardization.

1. **Chaotic Information Metasurface for Direct Physical-Layer Secure Communication**

This article proposes a novel physical-layer security approach using programmable metasurfaces driven by chaotic dynamics to enable direct, secure wireless communication. The core idea is to exploit sensitivity to initial conditions in chaotic sequences to modulate the metasurface’s local reflection phase profile so that the transmitted waveform appears as unpredictable chaos to eavesdroppers but is recoverable by receivers that share the physical chaotic key. The paper presents a conceptual design and laboratory prototype of a reconfigurable metasurface controlled by time-continuous chaotic sequences and analyzes its resilience against passive interception and parameter-recovery attacks. Comparative discussion emphasizes lower edge-compute complexity and energy consumption versus conventional cryptographic schemes, making the approach attractive for resource-constrained IoT links and low-latency scenarios. Practical challenges highlighted include precise synchronization requirements, fabrication and calibration of metasurfaces, and channel impairments. The authors conclude that combining chaos-based signaling with metasurface programmability opens a promising research direction for scalable physical-layer security.

1. **Improving Next Location Prediction with Inferred Activity Semantics in Mobile Phone Data**

This paper proposes a hybrid model that operates in three steps: extracting activity semantics (for example Home, Work, Shopping) from mobile trajectory data, integrating those semantic features with spatiotemporal features, and predicting the next location using an end-to-end deep learning architecture combining sequence models and an attention mechanism. Results Adding activity semantics significantly improves next-location prediction accuracy compared with sequence-only methods, especially in dense urban areas and NLoS conditions. Limitations the approach requires accurate activity labeling or inference, is sensitive to the quality of location data, and faces generalization challenges across different cities and populations. Applications more accurate location-based services, improved urban traffic management, and personalized location-aware services for transportation and marketing.

1. **Streamlining Wearable Data Integration for EHDS: A Case Study on Advancing Healthcare Interoperability Using Garmin Devices and FHIR**

This case study describes a practical pipeline for integrating wearable-generated patient data into the European Health Data Space (EHDS) ecosystem using Garmin devices and the FHIR standard. The project details data extraction from Garmin APIs, normalization and mapping strategies to FHIR resources (notably Observation and Device), and the implementation of a middleware bridge that delivers secure, structured patient-generated health data (PGHD) to clinical systems. Results show that time-series signals such as heart rate, step counts, sleep stages, and activity summaries can be semantically preserved and scaled within FHIR while addressing format heterogeneity and sampling-rate mismatches. Regulatory and privacy considerations are emphasized, along with the necessity for precise device metadata to reliably link wearable streams to electronic health records. Recommendations include creating FHIR profiles specific to wearable devices, developing data-quality validation tools, and establishing governance frameworks to enable trustworthy PGHD sharing across EHDS participants.