WISDM Dataset Overview

1. Introduction

The Wireless Sensor Data Mining (WISDM) dataset is a public dataset for human activity recognition (HAR) based on motion sensor data. It is widely used in research and education for developing AI models capable of recognizing daily activities from sensor signals.

2. Dataset Versions

- **WISDM v1.1**: Accelerometer data only (phone sensors).
- **WISDM v2.0 (Latest)**: Accelerometer and gyroscope data (phones + smartwatches).

3. Activities Recorded

Activity	**Description**
Walking	Casual walking
Jogging	Light running
Sitting	Sitting still
Standing	Standing upright
Upstairs Walking	Climbing stairs
Downstairs Walking	Descending stairs

Data Format

Each row in the dataset corresponds to one sensor reading.

Column	Description
user_id	Unique ID assigned to each participant
activity	The type of physical activity performed

timestamp	Timestamp in milliseconds
acc_x	Accelerometer X-axis value
acc_y	Accelerometer Y-axis value
acc_z	Accelerometer Z-axis value
gyro_x	(Optional) Gyroscope X-axis value
gyro_y	(Optional) Gyroscope Y-axis value
gyro_z	(Optional) Gyroscope Z-axis value

IDs and References

- **user_id**: An anonymized integer assigned to each user.
- **activity**: Activity labels such as Walking, Jogging, Sitting.
- Consistent activity labeling is crucial for model training.

Data Collection Protocol

Step	Instruction
Device Placement	Smartphone in front trouser pocket or waist secured tightly
Start Recording	Start sensor recording before beginning any activity
Perform Activities	Walk, jog, sit, stand, climb stairs for 3-5 minutes each
Stop Recording	After completing activities, save the recording
Label Activities	Prefer in-app labeling or use timestamp logs manually

Hardware Setup

- **Devices**: Android Smartphones (e.g., Samsung Galaxy S5, LG G3)
- **Sensors**: Accelerometer (required), Gyroscope (optional for richer data)
- **Sampling Rate**: Approximately 20Hz
- **Applications Used**: Custom WISDM apps or apps like Physics Toolbox Sensor Suite

Important Notes

- Maintain consistent device orientation for all users.
- Attach device firmly to minimize motion artifacts.
- Watch for gaps in timestamps and missing values.
- Normalize sensor values before model training.

Summary Table

Feature	Details
Format	CSV or TXT
Sensor Data	Accelerometer (+ optional gyroscope)
User ID	Integer identifiers
Activity Labels	Walking, Jogging, Sitting, etc.
Device Placement	Pocket or waist secured
Sampling Frequency	~20Hz
Collection Method	Mobile app recording

Conclusion

Following this guide ensures a thorough understanding and correct usage of the WISDM dataset. Maintaining consistent data collection protocols and ensuring high-quality sensor recordings are crucial for building reliable human activity recognition models.