**🧾 🎯 Project Title: BOT DETECTION FROM SENSOR DATA  
📅 Project Timeline:** October 2024 – November 2024  
🎥 YouTube Demo: Not available.  
📦 GitHub Source Code: <https://github.com/IvanSicaja/2024.10.06_GitHub_PRJ_Bot-Detection-from-Sensor-Data>  
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🏷️ My Personal Profiles: ⬇︎  
🎥 Video Portfolio: To be added  
📦 GitHub Profile: <https://github.com/IvanSicaja>  
🔗 LinkedIn: <https://www.linkedin.com/in/ivan-si%C4%8Daja-832682222>  
🎥 YouTube: <https://www.youtube.com/@ivan_sicaja>  
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### 📚🔍 Project description: ⬇︎⬇︎⬇︎

### 💡 App Purpose

The project aimed to **detect bot-like behavior from device sensor data**. By analyzing multiple event sources (touch, accelerometer, gyroscope, and pressure sensors), the system categorized datasets into **human-only behavior**, **auto-clicker**, and **auto-clicker with anti-detection enabled**. The main focus was on **touch events**, which provided the strongest patterns for distinguishing human activity from automated bot activity.

### 🧠 How It Works

1. **Data Preprocessing** – Converted raw .json data into row-column structure using **Python (pandas)** scripts. Preprocessing also involved **removing redundant scripts** and filtering datasets for relevant features.
2. **Visualization & Filtering** – Developed **custom Python GUIs with Matplotlib and Tkinter** to plot **1D (pressure), 2D (touch), and 3D (accelerometer, gyroscope)** data, with filtering and synchronized rotation for multi-dimensional comparison.
3. **Analysis** – Identified repetitive patterns, speed/precision anomalies, and variance differences between datasets. Classified behavior as **human-only, auto-clicker, or auto-clicker with anti-detection**.
4. **Results** – Auto-clickers were identified by **high precision, fast repetitive events, and small variance**, while human datasets showed **irregularity and lower precision**, consistent with natural input patterns

### ⚠️ Note

The datasets used in this project are not publicly shared due to confidentiality and may contain private data. This measure ensures confidentiality and responsible handling of information.

### 🔧 Tech Stack

**Python, Pandas, Matplotlib, Tkinter, Excel, Tableau, Data processing, Interactive plotting, Visualization dashboards, Classification logic**

### 📸 Project Snapshot

Not available.

### 🎥 Video Demonstration

Not available.

### 📣 Hashtags Section

**# #BotDetection #SensorData #DataAnalysis #Python #Pandas #Matplotlib #Tkinter #ComputerVision #HumanVsBot**