The "Pulse of the City"

The Data Source

The core dataset is provided by Code for Heilbronn, captured via a network of LoRa-based PAX Counters deployed across the city. These privacy-preserving sensors estimate crowd density by passively sniffing Bluetooth signals (MAC address advertisements) from nearby smartphones and smartwatches, transmitting the aggregated device counts over a low-power LoRaWAN network in near real time.

The Problem

Cities and retailers want to know how many people walk down a street, but raw sensor counts just numbers. Store managers and city planners struggle to visualize these data alongside contextual factors (like weather or holidays). Without an intuitive way to analyze past crowds, opportunities for efficiency are lost.

The Challenge

Build an interactive Tool that helps to get insights from those data that can be used by various parties for planning, reviewing and optimizing events, stores and maintenance. Moving from plain numbers to estimations and predictions would be extra cool.

The Deployment & Future Use Case (The "Why"):

- Lidl/Kaufland: Store managers use the dashboard to visually identify exactly when and why foot traffic spiked in the past, allowing them to optimize standard staffing schedules. With the added predictive layer, they can dynamically adjust baking times for fresh bread or push localized app discounts.
- PreZero: Planners analyze historical visual heatmaps to permanently redraw waste collection routes based on proven high-traffic zones. Using the secondary predictive tool, they can shift to dynamic routing—scheduling a targeted Sunday morning collection before bins overflow after a forecasted sunny Saturday at the Neckarufer.
- City of Heilbronn: Integrate the visualization tool into a public "Smart City Dashboard" so citizens can see how busy areas typically are at certain times. The predictive add-on can help the city manage dynamic street lighting, route traffic during major events, or place temporary infrastructure.

Key insight: The true value of this challenge isn't just crunching numbers; it's proving that teams can take raw, privacy-preserving sensor data, fuse it with real-world context, and turn it into an intuitive visual story. Adding a predictive model is the ultimate cherry on top that turns hindsight into foresight.

Advice for the Organizer:
To ensure teams succeed, provide the PAX Counter data in a clean, easily parsable format (like CSV or JSON) along with clear geographic coordinates for each sensor's location. Because PAX counters provide estimations (not everyone has a smartphone with Bluetooth turned on), encourage teams to think critically about how they normalize the data. You can offer "Bonus Points" for teams that successfully host their dashboard and predictive model on STACKIT or a sovereign cloud infrastructure, bridging the gap between raw data analysis and Schwarz Digits' focus on secure cloud deployments.