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IPN Develops Smart System to Monitor Potable Water Flow

- **A Master's project at CITEDI employs imaging and telecommunications technologies to develop a system that measures household water flow**
- **In the face of droughts, the data collected will help design strategies for sustainable water resource management**

To gather information on household water consumption and analyze flow anomalies, researchers from the Centro de Investigación y Desarrollo de Tecnología Digital (CITEDI) at the Instituto Politécnico Nacional (IPN) have developed an intelligent system to monitor home water usage.

The project, titled "Development of Smart City Prototypes for Municipal Problem-Solving Applications," is supervised by CITEDI researchers Sergio Jesús González Ambriz and Ciro Andrés Martínez García Moreno. The initiative is led by Daniel Rubén García Ávila, a student in the Master of Science in Digital Systems, who uses a combination of sensors, imaging technologies, and telecommunications to create a system that accurately measures water flow through household pipes.

"Given the national and global water scarcity, smart city projects must integrate various data variables with highly precise measurements to develop timely and effective action plans to address this crisis," García Ávila emphasized.

He explained that the system transmits information hourly via the Internet to a database hosted on Amazon Web Services (AWS). The data is then analyzed by an algorithm capable of detecting water leaks with high accuracy and predicting water flow behavior.

"We all have a physical water consumption meter, but our development is fully digital. It functions as a washer that records how many liters of water pass through at any given time, based on the number of rotations detected," García Ávila explained.

He added that the goal is to use this data to determine the months and days with the highest water consumption and design strategies for sustainable resource management.

This initiative is part of a broader effort to leverage emerging technologies for addressing specific urban challenges, enhancing quality of life, and improving service efficiency.

Although initially designed for Tijuana, this technology can be replicated nationwide and even applied to other environmental challenges, such as air quality monitoring, temperature control, and humidity tracking. These additional applications could contribute to more accurate weather predictions, according to the project lead.

For more information, visit www.ipn.mx

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