

AIOT Monitoring of Greenhouse Gas Emissions and Groundwater Leachate Leakage in Sanitary Landfills

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Agenda



Part 1: Ongoing Research Projects of School of Electrical, Electronics, and Computer Engineering of Mapua University

Part 2: AIoT Monitoring of Greenhouse Gas Emissions and Groundwater Leachate Leakage in Sanitary Landfills



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Part 1:

Ongoing Research Projects of School of Electrical, Electronics, and Computer Engineering of Mapua University



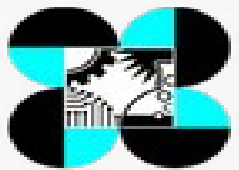
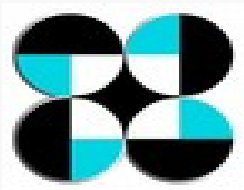
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Part 1: School of EECE Ongoing Research



- Development of Wireless Sensory Network System for Structural Health Monitoring of Bridges - **SMART BRIDGE** (National Funded Project)



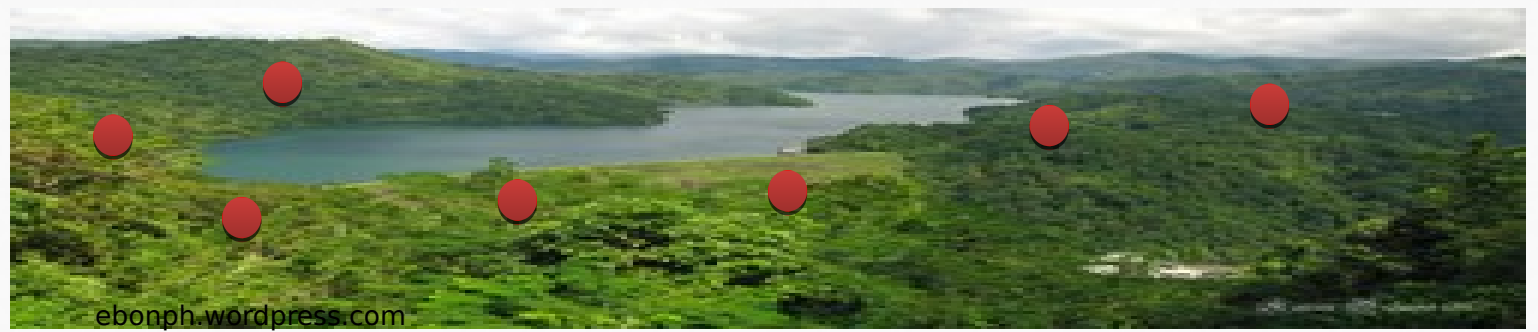
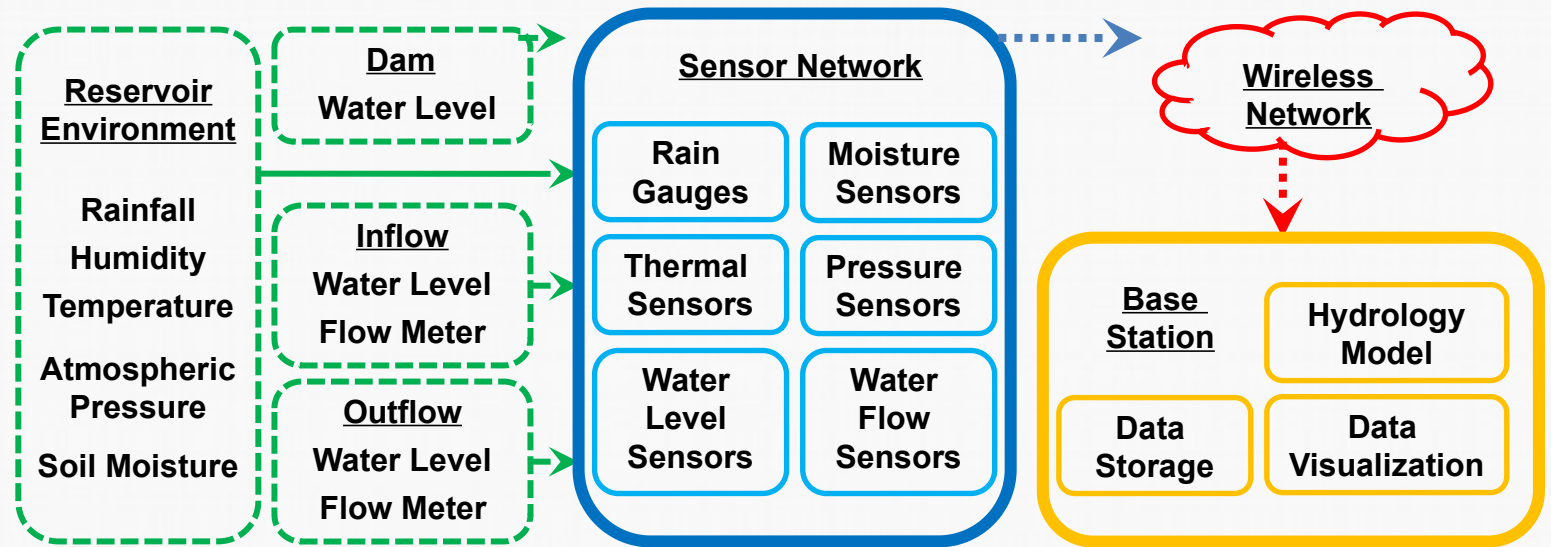
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Part 1: School of EECE Ongoing Research



Automated Real-Time Monitoring System for Water Dams - ARMS



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Part 1: School of EECE Ongoing Research



Sensor Nodes for Environment Monitoring



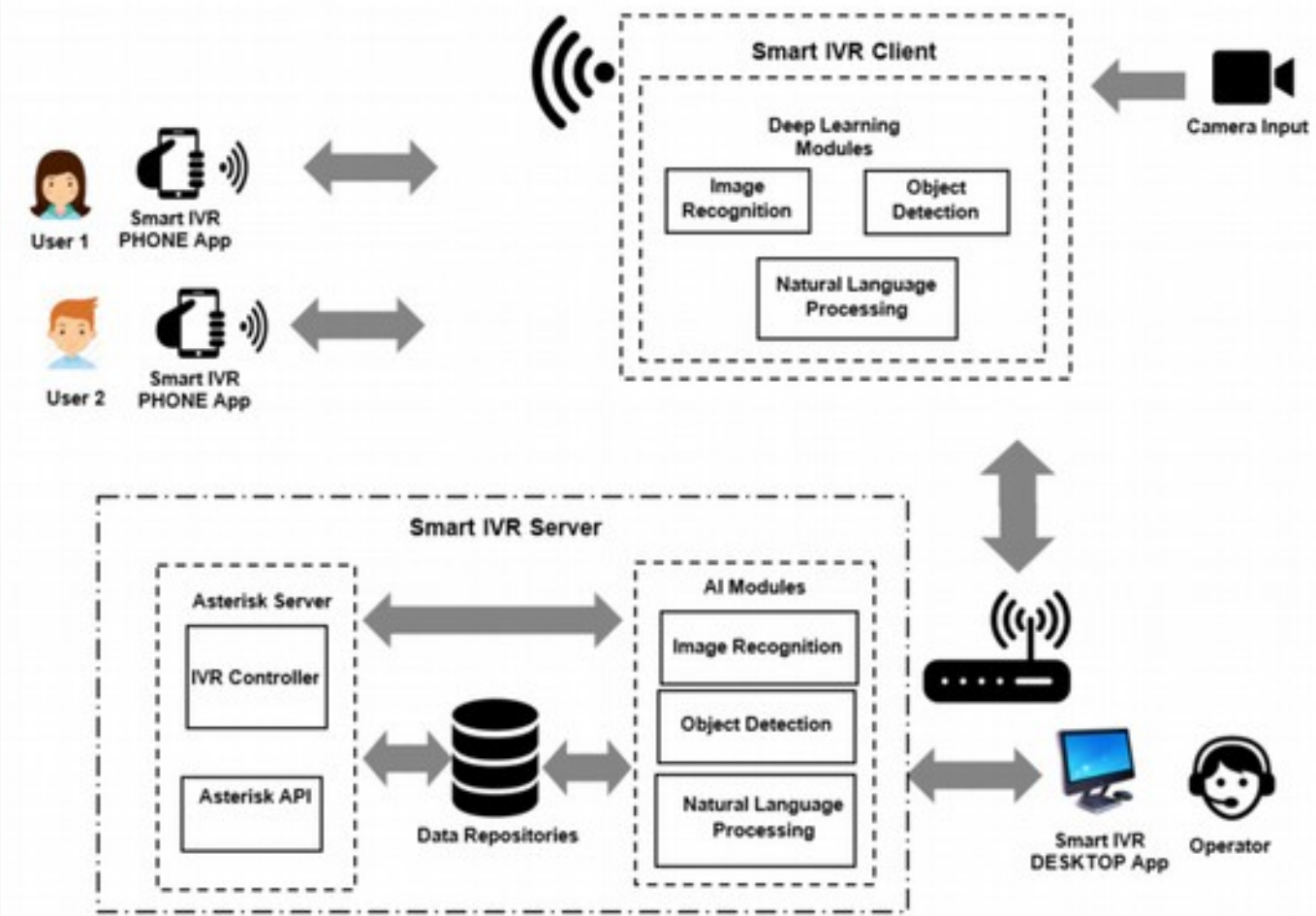
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Part 1: School of EECE Ongoing Research



- **Smart IVR System for a Disaster Resilient Smart City**





Part 2:

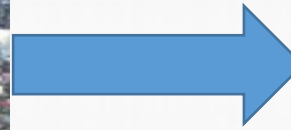
AioT Landfill Monitoring



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Introduction



- 12th most populated country in the world (104,134,624 as of July 2018)
- Population Prospect 2050: 135,964,944
- Source: <https://www.countries-ofthe-world.com/most-populous-countries.html>

Year	Waste Generated by the Philippines
2012	29,315 tons/day
2025	77,776 tons/day

Source: World Bank



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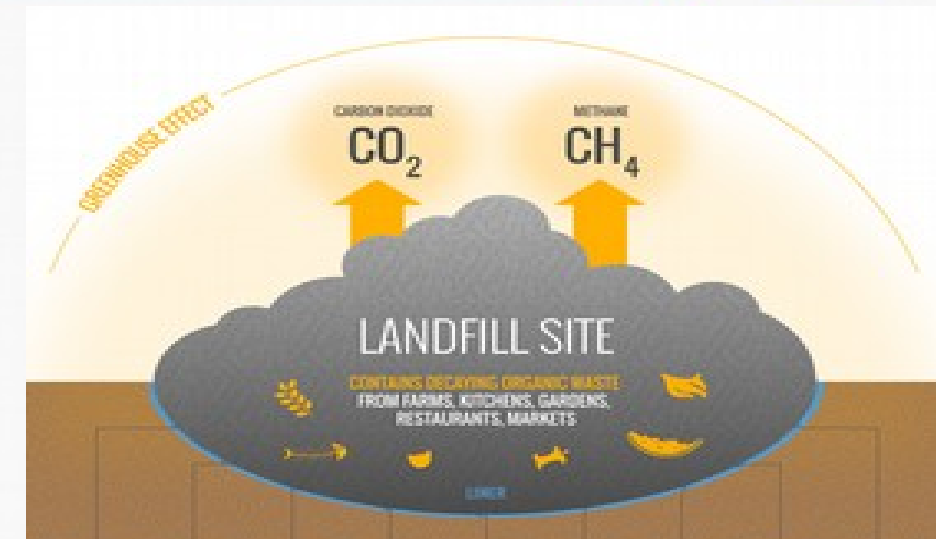
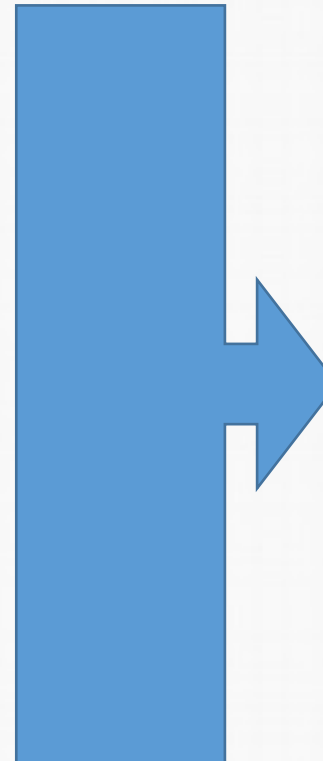
Introduction



OPEN DUMPSITE



SANITARY LANDFILL



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Introduction



Human Health



Environmental Effects



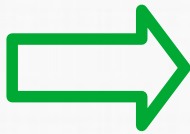
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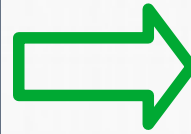
Framework



- Amount of methane and carbon dioxide emissions, temperature of the air
- pH level, electrical conductivity of groundwater sample



- Measurement of air temperature, greenhouse gases concentration, pH and electrical conductivity
- Wireless transmission of readings
- Store readings
- Predict Water and Air Contamination



- Display real-time readings
- Data files
- Measured parameters
- Correlation between air temperature and greenhouse gases

Input

Process

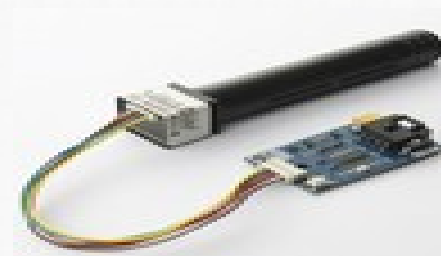
Output



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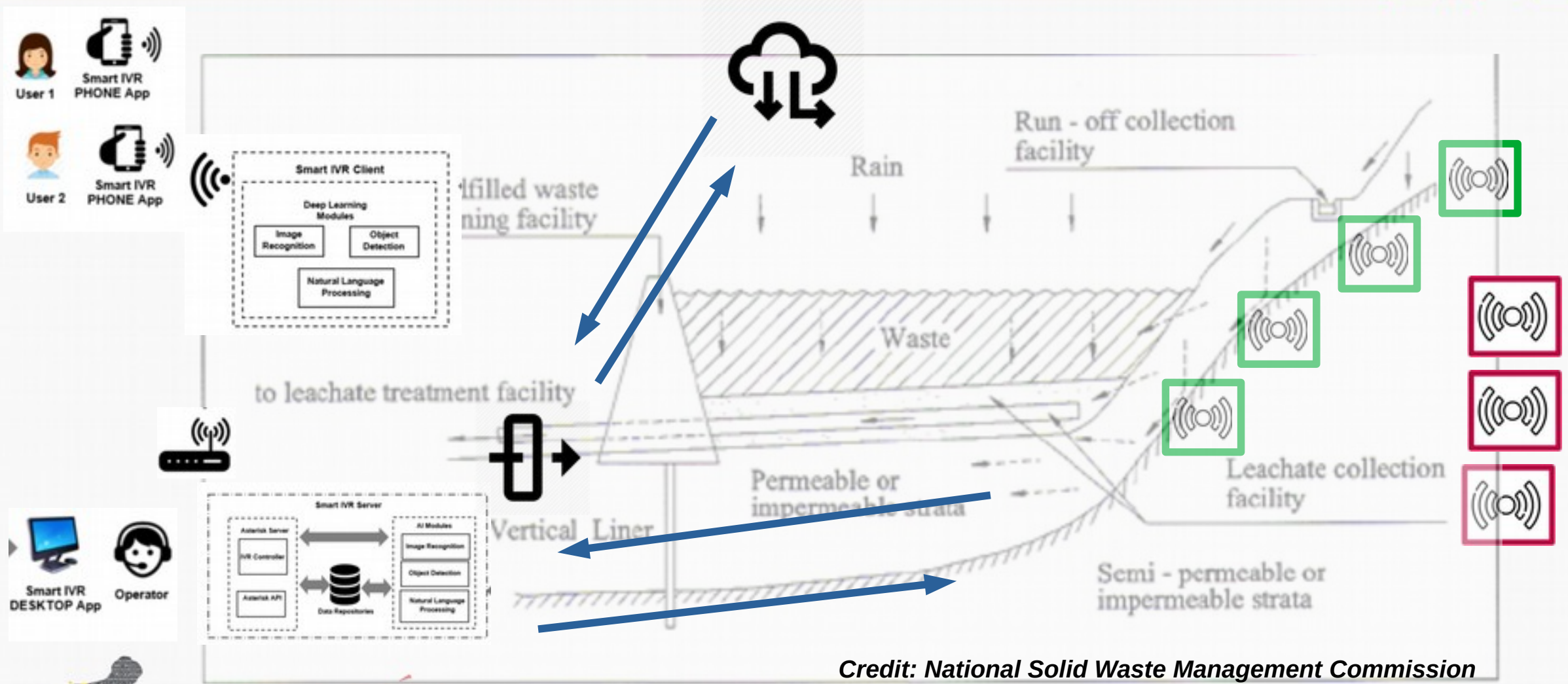
AioT Landfill Components



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AIoT Landfill Monitoring Setup



Credit: National Solid Waste Management Commission



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**Salamat
Xie Xie**

