

# Modernizing Cities Via Smart Garden Alleys With Application In Makassar City

Wangda Zuo, Pennsylvania State University  
Walid Saad, Virginia Polytechnic Institute and State University  
John Zhai, University of Colorado Boulder  
Award Type: EAGER [CNS-2241361 / CNS-2025377]



Project Website

## Project Challenge



How to transform Makassar City's garden alleys into smart environments?

## Intellectual Merit

- Assessment of real-world smart urban gardens in Makassar City, Indonesia
- Deployment of smart sensor networks to monitor urban gardens
- Novel machine learning frameworks for the operation of smart garden alleys

## Major Outcomes/Progress

- Assessed six garden alleys and found discrepancy in the performance/success
- Designed, assembled, and deployed sensor networks to monitor outdoor micro-environment
- Conducted interviews and surveys



Local Survey in Garden Alley  
Makassar, Indonesia



## Broader Impact



- Enhance the economic revenues through increased visitor
- Improve alley environment
- Decision making framework for city

## Future Goals

- Evaluate the environmental performance of garden alley with collected data.
- Promote further collaboration with local government and academic institutes to achieve the net zero carbon community by energy-food-water nexus systems.