

# Ooka LAB.

## [Future urban planning] [Future energy system to realize ZEB]

Department of Human and Social Systems

Urban Energy Engineering

Department of Architecture,  
Faculty of Engineering

<http://venus.iis.u-tokyo.ac.jp>

### Prediction of Building and Urban Environment

Prediction systems of building and urban environment have been developed to create sustainable building and urban spaces. We focus on flow, heat and pollutant dispersion in multiple scales from human-ambient to urban/regional.

- Wind velocity observation with a Doppler lidar
- Estimation of heat fluxes using Scintillometer
- Clarification of the flow field structure around building using SPOD
- Evaluation of thermal environment around human body using a thermal manikin
- Evaluation of thermal sensation in an outdoor environment with mist

- PIV measurement of flow characteristics during conversation, cough and sneeze
- Numerical analysis of removing effect of droplets and droplet nuclei by ventilation based on dynamic model
- Numerical evaluation of turbulent Schmidt number in street canyon

### Systems to Realize Zero Energy Building

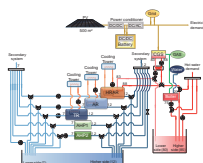
In order to realize Zero Energy Building (ZEB), it is important to improve the efficiency of heat source systems. We have improved them to reduce energy consumption. Air conditioning system with renewable energy sources and optimization of heat source system have mainly studied.



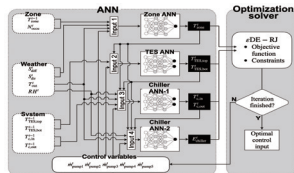
■ 21KOMCEE at Komaba campus



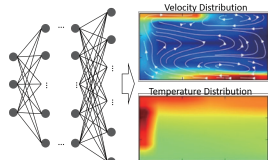
■ RE house at Kashiwa campus



■ Optimization of thermal and electrical grid



■ MPC of building heat source system using AI



■ Prediction of indoor airflow distribution using ANN

