

## Robotics-enabled Public Services on Toilet Bowl Cleaning

### Application

The general public have from time to time raised concerns about the toilet hygiene issue. Currently, toilet attendants are provided in public toilets with high utilization rates. In fact, the high utilization toilet environment cannot provide an up to present-day expectation as a place where toilet attendants may be busy with other cleaning tasks and are not able to station in toilets 24 hours a day.

Therefore, we intend to make use of easily manipulated robotic tools to help them clean the most disgusting and the most time-consuming job in toilet bowls and leave them more rest time or other cleansing work if such bowl cleaning system can perform task automatically even during their meal break.

In these prototyping projects, we aim to develop the robotics solution to help front-line workers, especially those aged workers, currently working under heavy workloads, insufficient manpower resource and high physical demand in poor working environment, deserving with more care from us. Although they may face dirty environment for their jobs, they contribute to our society consistently and silently.

The design of automatic toilet bowl cleaning system can make the cleaning of bowls in an enclosed space for cleaning, disinfect and remove residues remained in inner walls of toilet bowls to avoid fecal-borne bacterial transfer through the prototype of contact-type robot movable station, with necessary imaging-based inspection, analysis algorithm, water and detergent sprayers, pressure control, safety devices and indication panels.