

TECH OFFER

Soft Robot for Assistive Care of the Aged



KEY INFORMATION

TECHNOLOGY CATEGORY:

Healthcare - Medical Devices

Manufacturing - Assembly, Automation & Robotics

Personal Care - Wellness & Spa

TECHNOLOGY READINESS LEVEL (TRL): **TRL3**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174982**

OVERVIEW

Population aging is a global phenomenon as most industrialized countries are experiencing growth in the size and proportion of elderly citizens in their population. The percentage of older adults is estimated to be double by 2050 than that in 2019, which will place new challenges on the social economy and healthcare. The increasing population of elderly people requires great attention to be paid to age-related problems. Especially, the decreased physical capacities cause elderly people to rely on others to perform daily activities such as showering, dressing, and eating. The lack of independence in activities of daily living (ADL) decreases their quality of life and exaggerate financial burden for family healthcare.

According to studies on affected daily activities of older adults, the showering activity needs more frequent assistance than any other ADL. Existing commercial products, such as Tutti Assisted Bath Tub and Sit & Shower, can provide automated bathing assistance for the elderly people. However, the available products are usually time-based passive cleaning that lacks active

physical interactions with users, and thus they do not have some basic functionalities during showering such as scrubbing and wiping. Alternatively, robotic arms can provide active support in showering activity. Recent soft robotics technologies ensure safe and comfortable human-robot interactions. With different types of actuation (e.g. pneumatic, cable-driven), soft robotic manipulators can have dexterous motions and adaptable stiffness to achieve desired tasks.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology consists of a soft robotic arm and machine learning based algorithm. It can assist elderly people during showering activities according to the user's needs. As an example, the robotic shower can wash body parts that may difficult to reach, like the back or lower part of the legs. In particular, it has unique features that include:

- Safe and comfortable human-robot interaction for pouring water and wiping
- Air or water actuation
- Affordable and cost effective

POTENTIAL APPLICATIONS

The applications include but are not limited to:

- Assist showering activity for elderly people
- Luxury high-tech showers
- Re-purposed to assist disabled people or hospitalized patients

UNIQUE VALUE PROPOSITION

Our robot is based on user-centred design. Soft robotics is widely recognized as enabling safe human-robot interactions owing to its inherent compliance, compared to traditional rigid robots. The soft robot is equipped with machine learning based intelligent algorithms to efficiently accomplish desired assistive tasks.