HW0288: Engineering Communication II

Assignment 1: Writing an Introduction

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Title: Developing an Interactive Interface for Taps to Aid Water Conservation

The scarcity of water, the single most essential liquid to life, is a phenomenon that billions of people experience every day, but also something that those of us fortunate enough to have access to year-round clean running water often find difficult to empathise with, despite ongoing worldwide efforts to provide clean drinking water and sanitation services. The WHO (World Health Organisation) and the UNICEF (United Nations International Children's Emergency Fund) estimate that, as of 2019, one in ten people (785 million) still lack basic water services; moreover, as many as 2.2 billion people do not have access to *safely managed* drinking water services [1]. Therefore, water conservation assumes even more importance, especially as there is a limited supply of fresh water available to humans, which accounts for less than 0.3 per cent of all the water on the planet [2]. One of the simplest ways that water can be conserved in everyday life, to drastic effect, is to turn off water taps (faucets) when not in use, thereby saving hundreds of litres of water per month [3].

One common method to achieve this is an auto-shutoff mechanism in taps, so that they do not dispense it for longer than absolutely necessary, by automatically shutting off the water flow after a preset duration. These are commonly used in many homes as well as outdoor establishments. However, these taps' mechanisms are often unreliable, as they may either shut off almost immediately (thereby leaving insufficient time to use the water) or run for a longer time than expected, defeating the purpose of water conservation. Even though this means more time available to use the water, not all of it is guaranteed to be used, depending on the specific situation.

A more effective method is to install sensors in taps that detect the movement of a hand and control the water supply accordingly. This has the advantages of being able to dispense water for as long as the user wants to, as well as not requiring any physical contact, so preventing the transmission of pathogens. However, these tap systems are not only expensive to install,

but need electricity to work, so they are difficult to maintain for ordinary homes. Hence, they are normally used in restrooms in public places such as airports, cineplexes and hotels, rather than homes [4–5]. In any case, there may still be wastage if the user's hands are detected for an inordinately long time.

This paper proposes a new screen-based interface for controlling the flow of water in taps. It will consist of a small touchscreen built into the tap that shows various durations (in seconds) for users to select, or common tap-based activities, such as brushing, drinking and mouth-rinsing, that give an estimate of how long should water be released. In addition, the interface will also accept voice commands from the user that control the duration for the water flow, providing a touchless option that is intuitive and hygienic. It is hoped that this novel interface will provide an interactive method to give the user control of how much water s/he may need in day-to-day applications.

References:

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