

Future Affair: An Artistic Exploration of Socially Distanced Affective Touch via Forearm Stimulation

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Abstract— 'Future Affair' is a project to explore affective touch and interpersonal connection using tactile sculptures and robotics. Our initial work focuses on C-Tactile afferent-optimal touch, with one individual stimulating the other through a mediated stroking touch experience. Here, we describe the first steps in creating a socially distanced intimate connection between two individuals.

I. INTRODUCTION

Art responds to life -- the questions, concerns, and movements of the day. COVID-19, has forced us to more fully appreciate haptics, and reflect on the humanity behind touch. Humans are social beings, and through interpersonal touch we express affection, care, and compassion. COVID-19 has dramatically changed touch, with direct human-to-human contact no longer symbolic of warmth and connection, but, instead, something to be feared and avoided [1]. With the importance of touch in development [2] well-being, and social bonding relatively well established [2][3], we aimed to create an experience that could allow participants to once again interact through touch. We take inspiration from work on the role of C-Tactile Afferents, which are low-threshold unmyelinated afferent nerve fibers that respond most vigorously to slow stroking touch, in socio-affective touch [2][3]. Building on previous work that applies haptics to social touch [3], we take an artistic approach to explore what it means to receive affective touch during COVID-19, enabling two individuals to apply and receive CT-optimal, slow stroking touches, at a distance.

II. FUTURE AFFAIR

'Future Affair' is an interactive artistic rumination on the human desire for contact, and what we have lost to COVID-19. The first prototype consists of two components: a caressing robot and an interactive control sculpture. A participant, **The Touched**, sits in a chair and places their arm on a supportive foam pad. Suspended above **The Touched's** forearm hangs a lifelike silicone finger. The finger is connected to a lead screw mechanism, and the position of the finger can be changed by a stepper motor, to create a slow stroking motion of 3.1 cm/s, which is within the CT-afferent optimal range [3]. The other participant, **The Conductor**, stands in front of a ceramic sculpture. The sculpture is slightly angled and is heated to skin temperature. It consists of a touch-sensitive undulating surface where the surface is sculptured to steer **The Conductor's** fingers along a path. As **The Conductor** engages with the sculpture, it



Figure 1: *The Conductor* utilizes a controller (top) to stroke *The Touched* (bottom)

senses hand position and delivers a control signal to the stepper motor. Additionally, **The Conductor** experiences their own touch through a series of vibrotactile actuators (ERMs) correlated to touch speed, and LEDs embedded within the surface of the sculpture.

III. RESULTS AND DISCUSSION

In a first informal study, two participants could freely explore the installation, fulfilling the roles of *The Touched* and *The Conductor*. A total of eight participants provided their initial responses to the installation verbally. Results demonstrate that participants fulfilling the role of *The Touched* show affective responses to the touch of the lifelike silicone finger. They remarked the presence of tickling sensations, light pressure, and the touch was described as soft and calm, making it feel pleasing, soothing -- similar to a real human touch. The touch was found to be soothing. Furthermore, it was found that participants fulfilling the role of *The Conductor* continued their engagement with the sculpture as their touch indirectly stimulated positive emotional responses of *The Touched*. They remarked feeling satisfied, knowing that the other person took pleasure from their actions.

'Future Affair' is an ongoing collaboration between TU Delft and the artist. We aim to develop further interactions that utilize remote affective touch to explore cultural norms and taboos surrounding touch.

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