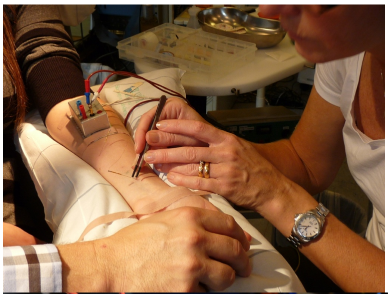
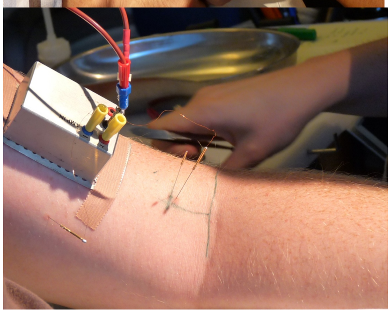
About Microneurography...

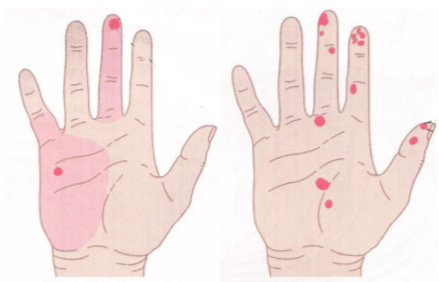
Microneurography is a challenging technique that allows recording single unit activity of afferent fibers in response to a skin mechanical stimulation in awake human participants. The technique was historically developed in Sweden by Vallbo & Hagbarth (1968) and is currently used in the University of Gothenburg where Prof. Vallbo resides as an Emeritus Professor. This technique is not only useful to compare those results found in animals to those found in humans, but also provides a direct way to compare the impulse activity in primary afferents to the sensation experienced.





Microneurography experiments provide a unique opportunity to measure sensory information that is constantly received and processed in the central nervous system. These experiments require participants to be seated as comfortable as possible, because they can take several hours. The process of finding the nerve requires a highly-skilled, trained scientist. A thin electrode, which is smaller than an acupuncture needle, is inserted through the skin and into the nerve, in a painless procedure. Once the nerve is found, recording/stimulation, in combination with psychophysical methods are used to gain a better understanding on the properties of skin receptors in relation to touch perception.

The main objective of the PROTOTOUCH project is the creation of innovative tactile displays that can elicit distinct sensations on the skin. Our main role in this project will be to use the microneurographic technique, in combination with other relevant methods, to identify the physiological and psychophysical nature of the sensations elicited.



RF RAII-Pacinis SAI-Merkel

In the human glabrous skin there are four types of tactile afferents that respond to different types of touch (pressure, texture, etc.), and they elicit different types of sensations when stimulated electrically; flutter, pressure and vibration have been described. These sensory afferents have different receptive fields (RF), conduction velocities and they adapt differently to a continuous indentation. For example, rapidly-adapting type 2 (RAII) and slowly-adapting type 2 (SAII), which are and are both located in deep skin, have large receptive fields (RF) with vague borders. In contrast, rapidly-adapting and slowly-adapting type 1 (RAI, SAII) are located in superficial skin and have small receptive fields and sharp borders. The roles played by these specific mechanoreceptors during the active exploration of tactile displays for recognition or discrimination purposes are the main focus of our studies within the PROTOTOUCH project.

Mario Amante (PhD student), Dr. Mariama Dione (Post-Doc), under the supervision of Prof. Johan Wessberg and Dr. Rochelle Ackerley of the University of Gothenburg (Sweden).