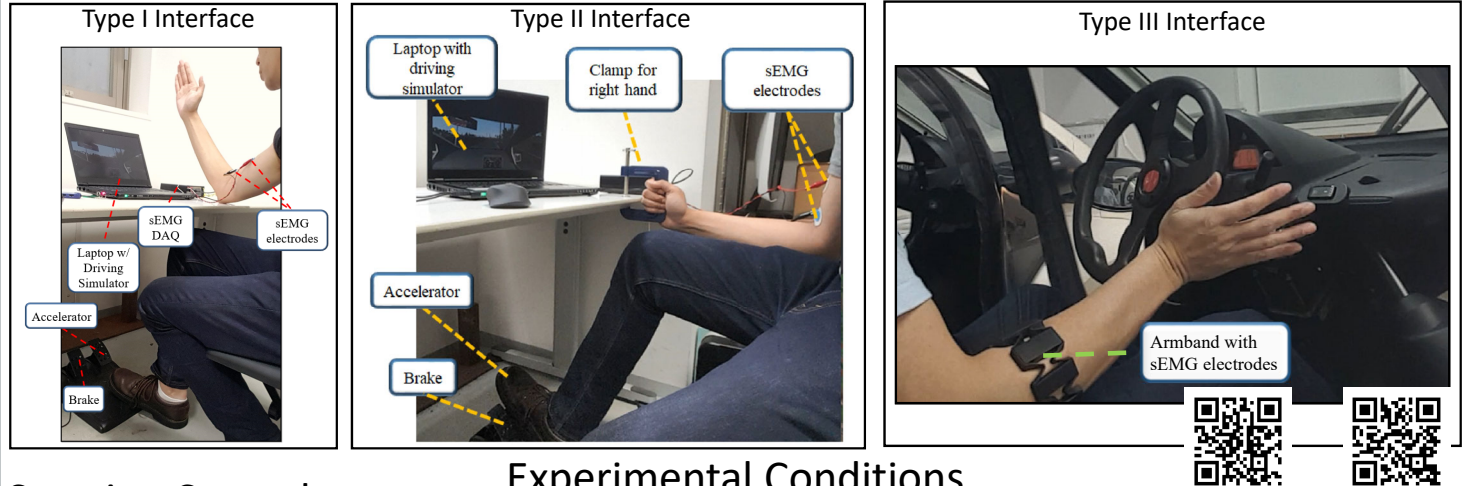


Steering Control Using sEMG

Overview

Surface electromyography (sEMG) is normally applied in order to control prosthetics, power wheelchairs, etc. In this research, human machine interfaces using sEMG were developed and evaluated with respect to path following accuracy with a driving simulator and an actual vehicle. Three interface types are shown below.

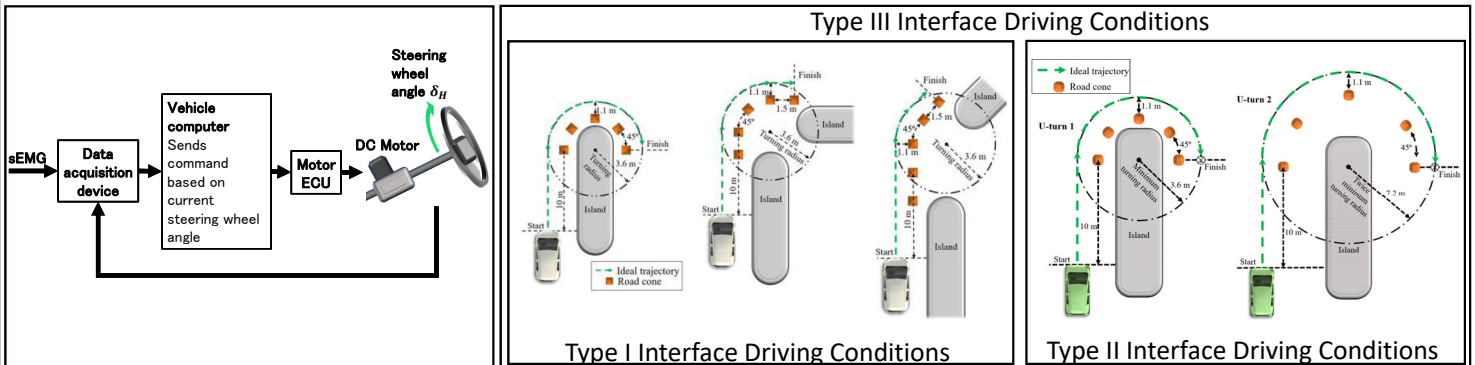


Steering Control

sEMG signals control the steering wheel of an actual automobile as shown below.

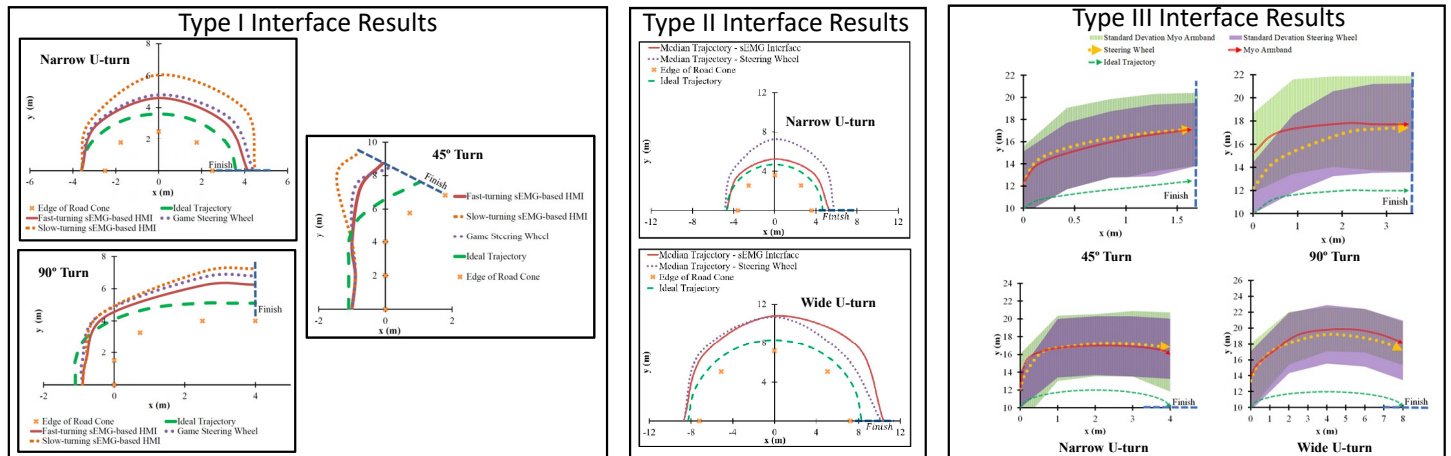
Experimental Conditions

24 test subjects operated the Type I interface under three driving conditions. 16 test subjects operated the Type II interface under 2 other driving conditions. 5 test subjects performed all driving conditions with an actual vehicle.



Current Experimental Results

All driving conditions considered, compared to a steering wheel, the Type I, Type II and Type III interfaces have the highest path following accuracy. Based on these results, we plan to perform experiments in other driving scenarios.



Publications

Nacpil, E.J.C., Nakano, K., 2020, Surface Electromyography-Controlled Automobile Steering Assistance, *Sensors*, 20, 809.
Nacpil, E.J.C., Wang, Z., Zheng, R., Kaizuka, T., and Nakano, K., 2019, Design and Evaluation of a Surface Electromyography-Controlled Steering Assistance Interface, *Sensors*, 19, 6.
Nacpil, E.J.C., Zheng, R., Kaizuka, T., and Nakano, K., 2019, A Surface Electromyography Controlled Steering Assistance Interface, *Journal of Intelligent and Connected Vehicles*.