

This can be used to control an autonomous humanoid robot. The Movement state of the robots are purely depends on either Process-directed(continous process) or target-directed strategy(exchanging target process).[2]

II. System Construction

The Authors successfully develop an EEG-based, hybrid BMI with a highly modular structure to account for the needs of brain-robot interfaces, in particular to allow for easily interfacing to different robots. They used Honda's Humanoid Research Robot. Their BMI system exploits two distinct cortical activity patterns to increase the number of controlled dimensions. Raw data stream are constantly scanned for both patterns.

III. Experimentation and Result

All experiment was conducted with the real, physical robot. The authors used realistic- type task. They created a simplified "store" in lab which each "store" have 3 shelves, arranged at the three sides of a rectangular area. Ten basket in different colors are placed on these shelves. The robot are saved with an image of how the positioning of the shelves. The BMI user need to collect five out of ten baskets by navigating the robot close to that item. The location are fixed equally to each of the subject. There are only four directions that can be used and navigated for the robot which is forward, backward and sidesteps left or right side. There are seven participants involved in this experiment and they need to do six times of valid sessions to get six data sets. Once a robot finish "step" or "turn", the system will request new state decision from the data processing module. The robot will only leave BMI zone if they are in the vicinity of basket and calling for the movement of "grasping".

After everything is recorded, the author notice of slight EEG error in hybrid BMI, which is error detection rate of 0.23; because the EEG in BMI are not perfect. Some participants are having difficulty with performing ERD in the complex setting. This assumptions are made because of error-state detection rates which is 0.3; for the ERD part alone, but the P300 are not affected by this.

IV. Conclusion

The Authors implement this advanced yet sophisticated system approach is to help handicapped people with robots as their intermediary. . Empirical study was used together with HHRR in the robotics lab where they employed and every-day task like shopping and related to test the functionality of the systems. Out of all participants, only one successfully used the switching of P300 and ERD naturally.