

BME Senior Design Project: Biopotential Car

Objective: build a small, remotely controlled vehicle that has the following characteristics:

Vehicle chassis and drive mechanism are to be built in the lab

Vehicle is battery powered, up to +24 VDC

Controlled by a measurable biopotential (EMG or EOG)

Wireless control (infra-red or RF wireless, or other)

Will include analog-to-digital and digital-to-analog control and power circuits

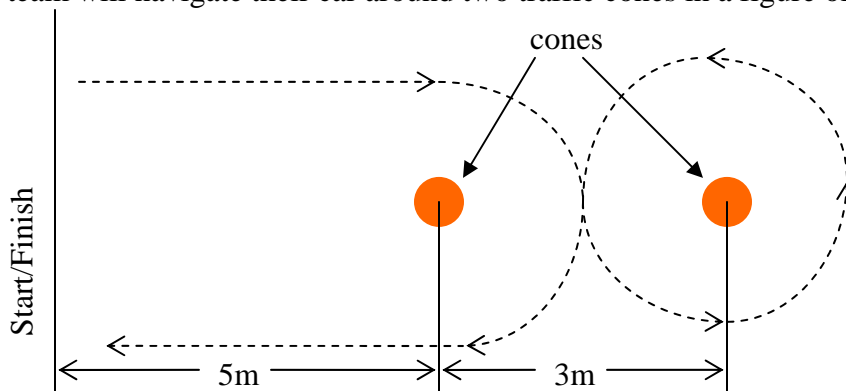
Requires the use of motor speed control

Should include feedback-control of some aspect of the car (speed, turning radius, etc.)

Students will form teams of 5 to 8 students. You have a great deal of freedom in your design. You should begin by doing a Functional Decomposition (recall Junior BME Design web-based tutorials), that is, a flow chart showing how the sensing, control, and power signals will flow through your system. You will need to divide the system into subsystems that each need to be designed and tested, then integrated into the finished vehicle system.

End of term competition:

Each team will navigate their car around two traffic cones in a figure of 8 pattern as shown:



Fastest time through the course wins!

Objectives of the design project: Every student on every team should rotate through the various design problems for the car so that they understand how the entire vehicle works. By the end of the term, any one of the students should be able to stand before a group of engineers and describe, in detail, how each subsystem operates, and how the systems were integrated to achieve the final vehicle system.

EMG resources:

<http://en.wikipedia.org/wiki/Electromyography>, Google search "how to build EMG"

EOG Resources:

<http://en.wikipedia.org/wiki/EOG>, Google search "how to build electrooculogram"