Quizz 1, 28 September 2016

*Braitenberg Vehicle (Shy) that escapes from light. Motors rotate wheels to go forward only.*

Given is a Braitenberg Vehicle as presented on Lecture 1 and figure above. It has two wheels controlled by motors M1, and M2, respectively (and a flyer wheel in front). It has two light sensors S1, and S2, located in front. We assume that all signals are binary. If M1=0 motor M1 stops (no motion). If M1=1 the motor attached to wheel 1 rotates forward. In class we presented Shy and Aggressive BV. Figure above demonstrate the Shy BV.

In this quizz your task is to design a more advanced vehicle, controlled on input by four disjoint signals from voice recognition:

**FORWARD**: your robot drives forward, disregarding light conditions.

**SHY**: your robot behaves like the Shy BV from class.

**AGGRESSIVE**: your robot behaves like the Aggressive BV from class.
**STOP**: your robot stops and does nothing, regardless all other signals from the environment.

***WHAT YOU HAVE TO DO:***

1. (5 points) Draw the state diagram of your BV “voice controlled” robot. Call this MACHINE 1. Use signals S1 and S2 for input and M1 and M2 for output. Call your internal states FORWARD, SHY, AGGRESSIVE and STOP. Add a four-valued input signal, corresponding to commands FORWARD, SHY, AGGRESSIVE and STOP.
2. (5 points) Draw the logic circuit corresponding to this diagram. Use logic gate and/or multiplexers.
3. (5 points) Create a new similar machine, assuming that the motors are described by ternary logic signals: 0 = stop. 1 = rotate forward. 2 = rotate backward. Explain in English behaviors of your new “vehicle”, called MACHINE 2.

Credits will be assigned for partially good solutions. Creativity will be rewarded. You can use additional sheet of paper.