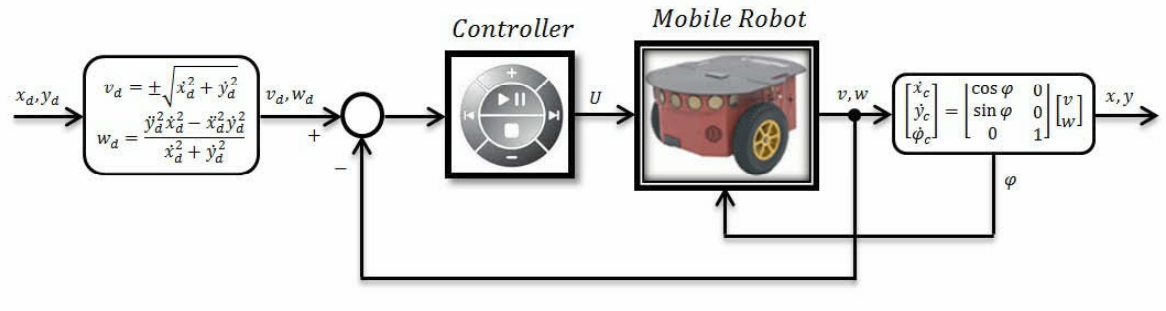

Figure 3.7: Control diagram of the mobile robot.

Parameter	Symbol	Value
Radius of each wheel	r	$0.1m$
Wheel base	b	$0.26m$
Forward distance of center of mass from center of rear axle	d	$0.05m$
The length of the robot	a	$0.5m$
Mass of the robot without the driving wheels and motors	m_c	$7Kg$
Mass of each driving wheel plus its motor	m_w	$1Kg$
Moment of inertia of the platform without the driving wheels and the rotors of the motors about a vertical	m_w	$1Kg$
Moment of inertia of each wheel and the motor rotor about the wheel axis	I_w	$0.005Kg.m^2$
Moment of inertia of each wheel and the motor rotor about the wheel diameter	I_m	$0.0025Kg.m^2$
Armature resistance	R_a	0.71Ω
Armature inductance	L_a	$0.66mH$
Reference voltage	V_s	$12V$
Electromagnetic force constant	K_{emf}	$0.023\frac{V}{\frac{rad}{s}}$
Torque constant	K_{motor}	$0.029\frac{N.m}{A}$
Controller gains	K_1, K_2	$20, 10$

Table 3.1: Parameters of the mobile robot.