2.5. THE DIRECTED GRAPHS' METHOD

The last approach of my problem is the usage of directed graphs to say if the system is stable or not.

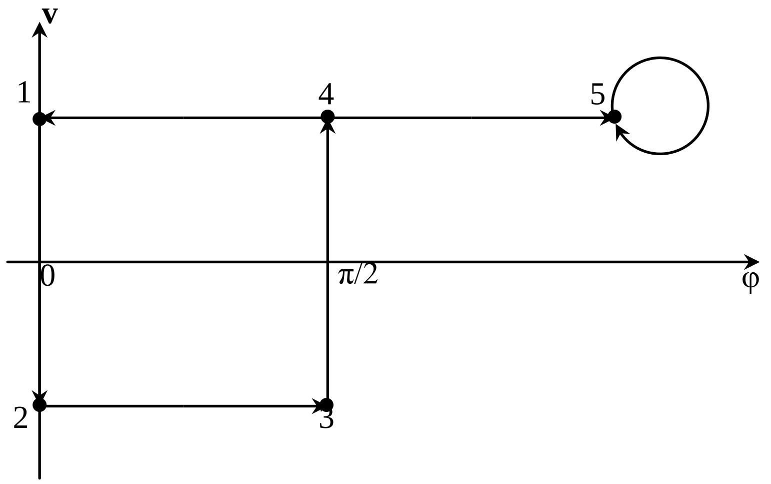


Figure 2. The directed graph

The directed graph from figure 2, represents exactly the same steps as the nondirected one. However, you can easily see a difference in step 5: if the car robot is passing to step 5, it cannot come back, but it will remain felt down.
The adjacent matrix associated to this directed graph is denoted by C and it has the following values:

$$C := \begin{pmatrix} 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

with the following eigenvalues:

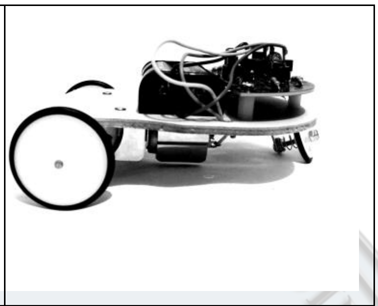
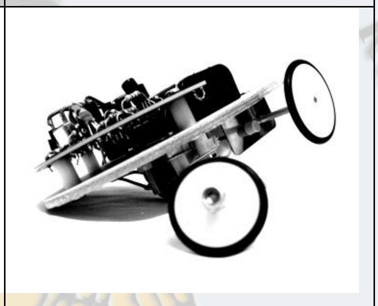
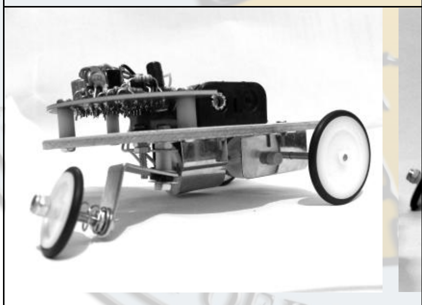
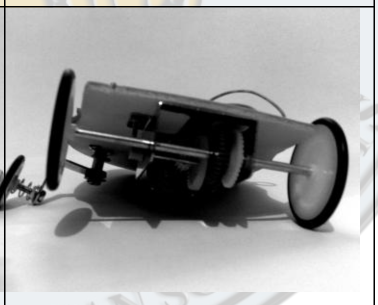
$$Eigenvalues(C) := \begin{bmatrix} -1 \\ I \\ -I \\ 1 \\ 1 \end{bmatrix}$$

Hence, the system is again UNSTABLE.

3. Results

I stated a problem about the forced instability of an electric car-robot, and I tried to prove this from Mathematical point of view.

There will be few pictures with the car robot while going it down.

	
Top view	Lateral view
	
Front view	The car robot felt down
	
Lateral front view	Back view

Conclusions

All the methods use were successfully applied, except first one because of the lack of a rigorous meaning of the system described.

To sum up, modifying a car robot, for your personal enjoyment, you may obtain an unstable one.

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