# Navigation Function

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## 1 Introduction

An introduction to robot motion planning implemented by potential field approach with navigation function.

## 2 Navigation Function

$$\phi = \frac{\gamma}{\left(\gamma^k + \beta\right)^{1/k}}$$

### 2.1 Goal Function

$$\gamma = \|p - C_v\|^2$$

### 2.2 Obstacle Avoidance Function

$$\beta = \frac{1}{1+e^{-\left(\|p_{io}\| - \frac{R}{k_1}\right)\left(\frac{k_2}{R}\right)}}$$

### 2.3 Dynamics

$$u = -K\nabla_p \phi$$

## 3 Simulation

### 3.1 Qt

### 3.2 Matlab

## 4 Repository

You can find the resource in my Repository.

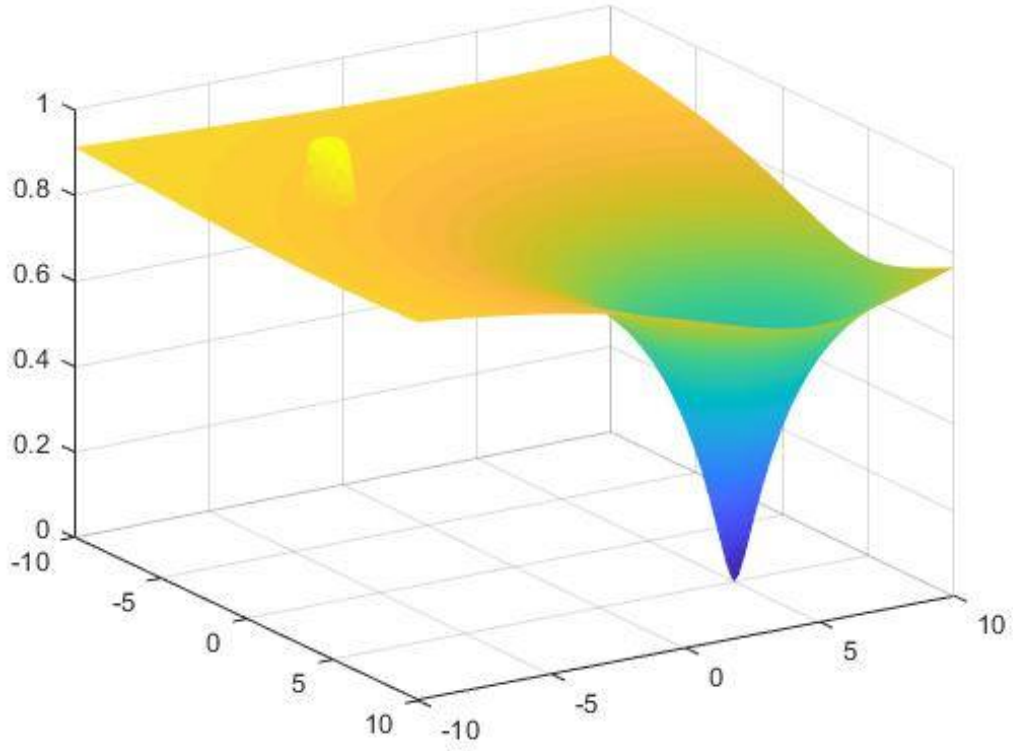


Figure 1: This figure shows the potential field caused by navigation function.

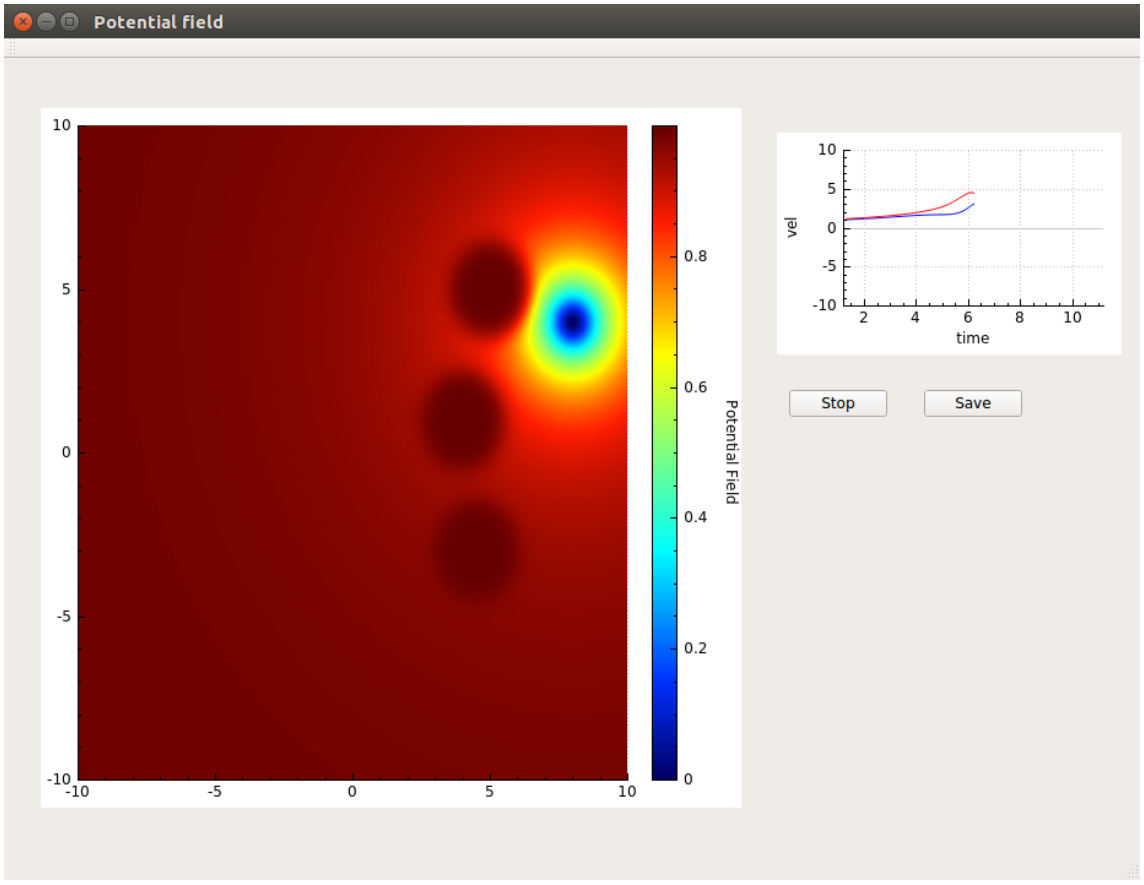


Figure 2: This figure shows the the potential field by colormap.