ID6108-Process and Design for Additive Manufacturing

Assignment-6

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Discrete Element Method Simulation using Carrom Board

The Python program creates a carrom board game that allows the user to interact with it. It exactly mimics the discrete element system. Hence, we can simulate the discrete element interaction-

1. The program first initialises the carrom board simulation by defining the board dimensions and the values of the fundamental quantities.

   Initial Width and Height

   (Width, height) = (560, 560)

   Coefficient of friction= 0.14

   Coefficient of restitution = 0.85

   Colours-

   BLACK = (0, 0, 0)

   WHITE = (255, 255, 255)

   RED = (255, 0, 0)

   GREEN = (0, 255, 0)

   BLUE = (0, 0, 255)

   ORANGE = (255, 165, 0)

   YELLOW = (255, 215, 1)

   WOODEN = (238, 197, 145)

2. The program then defines a collision function to define the interaction between the discrete particles, that is, the coins of the carrom board.
3. The program then defines the striker and coins, their colour, shape and size.
4. The program then defines the game loop. To define the interaction between the user and the graphical interface.

Guidelines for operating the simulation

1. Ensure that all the files are present in the present working directory, as they all will be required by the program.
2. Run the program Carrom.py and then an interface similar to the below one will appear. To enter the simulation, click on the play button by pointing to the mouse cursor at that point.
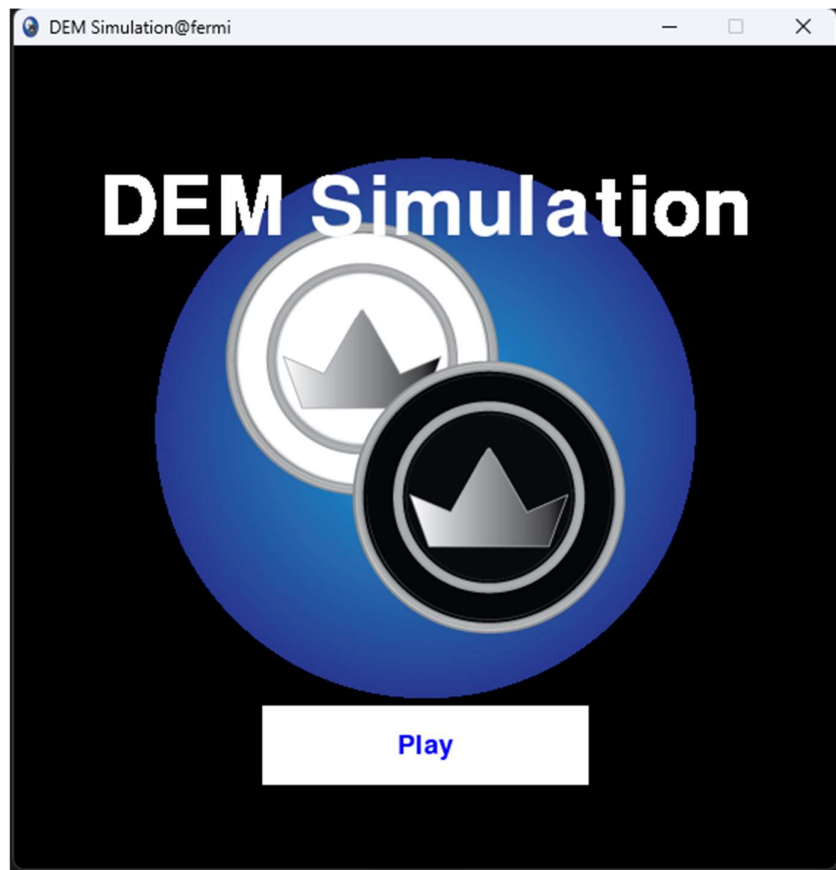
3. After hitting the play button, it will take to the simulation interface, where interaction can be made with the help of a mouse by right-clicking. It is represented below.

4. The program appends the position of the striker at the end of the cycle in the terminal or any other programming platform.