Automated Chess Bot

Team Members:
Pradyot Prakash
Chandra Maloo
Meet Shah
Shantanu Thakoor

Implementation Steps:

Week 1:
We will first of all set off with Mechanical aspect. We will design a mechanism for a robotic hand to move the pieces on the board. We will need hinges to move the arm and the entire framework backward and forward. A Solidworks model will be made first to stimulate all the motions and to calibrate them properly. The coding part will be started by one of us by this week end.

Week 2:
We will begin with Electrical part simultaneously by this time. We will understand the working of Raspberry Pi and work on setting the inputs and outputs for the arm. The motion of pieces will be detected by IP and accordingly the bot will know opponents move. Then the move will be analysed using some algo and then a move from the bot side will be suggested and implemented. The outputs will be directed through L293D. The mechanical part will also be on and completed by this week.

Week 3:
We will give a serious effort to Coding part by now. We will implement our code for AI in either C++ or Java or Python (not decided yet). We will also go on with integrating all the three aspects - Mech, Elec and CS together.

Week 4:
We are planning to finish off maximum things by 3rd week end so we can keep this week for debugging and improvisation. If we have more time we can even think of add ons on our bot.

Week 5:
We will keep the last week as buffer for any last time emergencies and thorough testing. We will keep on improving the algo of AI by incorporating new tactics from games played in various grandmasters.

Components:

1. Raspberry Pi/Beaglebone
2. Modified chess board (The board will be of a different colour than the pieces, so that the computer doesn't confuse the board and pieces while Image Processing). We will have to probably, stick coloured paper on the board to give it a different shade.
3. A wooden board to hold the entire setup.
4. WebCam to capture the change in the state of the board.
5. 4 stepper motors to control the movement of the entire frame on the chess board.
6. Hinges and slider frames to move the entire frame backwards and forwards.
7. Battery eliminator(borrowed from Tinkerers' Lab) to supply power to the various electrical components.
8. Screws and nuts to fix the entire arrangement in place.
9. L293D and 7805 to control the motors.

10. Wood to make the frame.
11. Wires to complete the circuit.

Learning:

- Developing motion mechanisms
- Using Raspberry pi
- An additional language Java/Python
- AI algorithms (might be Machine Learning too)
- Image processing
- Interfacing multiple components and joints
- And most importantly teamwork and the happiness of making a project.