

# Implimentation of Nine Men's Morris

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# Outline

- 1 Introduction
- 2 Milestones of Project
- 3 Software and Hardware Tools
- 4 Basic requirements to achieve target
- 5 Task distribution
- 6 Implementation phase
  - Program Architecture
- 7 Difficulties faced
- 8 Conclusion

# Introduction

- KUKA Ibr iiwa 7.
- Game called Nine Men's Morris.
- Cognex Camera.
- Artificial Intelligence.

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- Human vs KUKA robot.
- Robot can detect human moves and implement its moves wisely with AI.
- Robot knows its turn after human.
- through camera “Cognex” robot interects with real world.

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- Sunrise Workbench by KUKA.
- Eclipse for testing AI and server setup.
- GIT for version control.
- insight Explorer.
- Robotic Arm by KUKA.
- Interface to Cognex Camera.

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- Understanding of nine men's Games Rules.
- Get started with some useful methods of robot.
- Learn and approach for insight explorer.

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- Task 1: A simple program that move game piece from one point to another point (Sunrise Workbench).
- Task 2: Image recognition with Insight explorer.
- Task 3: Intersection points strategy.
- Task 4: Game filed board measurement.
- Task 5: code for game field board measurement.
- Task 6: First program that pick game pieces from out of the game field and place in to the given point on to the game field.

# Task distribution Continue...

- Task 7: program that wait until user play his moves than robot play its turn.
- Task 8: Implementation of extra features for human safety.
- Task 9: ideas for placing pieces in outside field (Horizontal or Vertical).
- Task 10: Merger of our program with AI.
- Task 11: Communication between robot and camera.

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## “Class Diagram “



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- understanding of robotics features of robot (Software).
- Cartesian coordinates.
- Safety Issues.
- Understanding of AI.
- piece recognition by insight explorer (still) due to light interference.
- game board alignment.
- communication of robot and camera.



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- Successfully done our target of basic game playing of Human Vs Robot.
- Improvements required:
  1. detection of cheat of Human player.
  2. our game starts from one fixed point, future enhancement will be it start from any random point.
  3. for now human player always start the game, in future any one can start the game.
  4. Alignment of game board is fixed, in future rotation of field does not matter.

# Thank You