

**LIESZKOF SZKI ZSOLT**  
**KISBENEDEK LILLA**

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# **PROJECT** **PRESENTATION**

PROGRAMMING OF INDUSTRIAL ROBOTS



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AIM

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## THE AIM

## INTRODUCTION

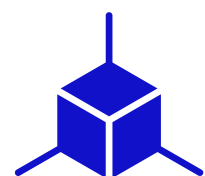
Detection of checkers, separating and placing them by their colors to the correct position on the table



## STEPS

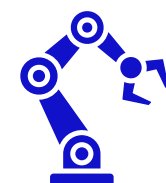
## STEPS

# FROM CONCEPTS TO WORKING ROBOT



### Design

Creation of the 3D models of checkers and the table.



### Environment setup

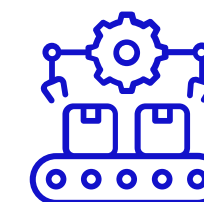
We used

- a UR16e robot
- table
- checkers and their table (3D objects)
- camera



### Computer vision

We take a photo, before the robot start to move. Then preprocessed it, and used Hough transform to detect the checkers positions.



### Pick & Place

Transformed the positions for robot coordinate system. The robot picks them separately and places them on a predefined position on the checkers' table.

# Used programs



**For 3D modelling  
CAD software**

For modelling of the  
checkers and the table.



**Offline programming  
simulator for industrial  
robots**

For simulating the real  
world environment and  
the robot movements.



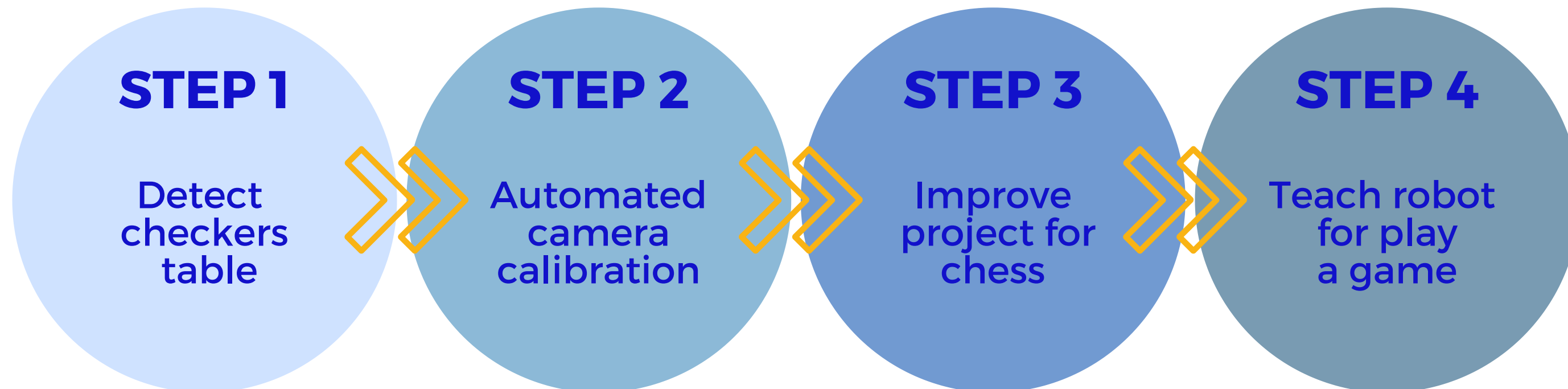
**Programming language**

For the implementation  
of computer vision and  
the calculation of  
transformations.

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# POSSIBLE DEVELOPMENTS

## TODOs





# THANK YOU

THE IMPLEMENTED CODE AVAILABLE AT:  
[HTTPS://GITHUB.COM/KISBLILLA/CHECKER](https://github.com/kisblilla/checker)

