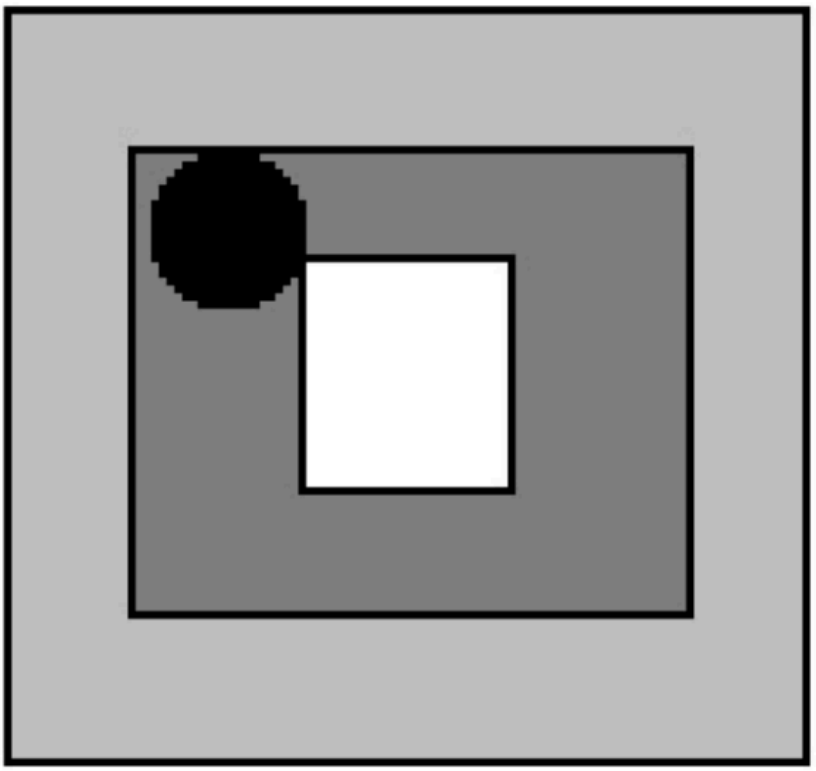
Computer Vision Challenge

Project Overview:

Welcome to the Computer Vision Challenge! Your task is to develop a **robust computer vision algorithm** capable of solving real-world problems with high accuracy and efficiency. This challenge will focus on designing, implementing, and testing an algorithm to process and analyze visual data

Instructions:

The front view of a square satellite port is shown in the figure below, the top-left of which has a circular marker touching the inner and outer squares. The outermost square's side length is 40 cm, and that of the innermost square is 30 cm. Spacing between each square is 2.5 cm. The view shown is from 1 m away.



a) Read the image, rotate it by an arbitrary angle, and then using code output the rotated angle by detecting the port, given the reference angle shown above (circle at top left).

b) Given the reference image above, read an arbitrarily cropped part of the image and output the camera movements in steps until the circle is visible.

c) Use homography perspective to code an output image of the port from a view that's from a slightly right side, 100 cm away from the port's centre looking directly at it, at an angle of 22.5 degrees.

d) Using the output view of the above question, make incremental camera movements so that the view reaches the front view, by always keeping the camera 100 cm away from the port's centre looking directly at the port.

Deliverables:

Push all assignments with their respective outputs on a private git repository. The use of LLMs for help with code is allowed, as the selected candidates will be scrutinized on their codes. Python and C++ are preferred, however, you're free to use any language of your choice.

Submission Guidelines:

Submit the deliverables on the following link:
https://forms.gle/FY951Q5TpGPa2G7P9

Contact Information:

For any queries, please open up an issue on your private git repository mentioning the username @kanishkanarch (after making this user a member of the repository by sending invite).

If you encounter any issues or have questions regarding the challenge, feel free to reach out to **admin@aule.space**.

References:

Homography: https://en.m.wikipedia.org/wiki/Homography_(computer_vision)

Feature detection: https://en.m.wikipedia.org/wiki/Feature_(computer_vision)

Computer vision reference book: https://szeliski.org/Book/

Good luck, and have fun with the challenge!