

Allowed time: 40 minutes

Consider a camera of 2040 rows x 2580 columns whose pixel size is 1.8 μm . Image of acquiring a scene for analysing objects of 45 cm * 35 cm coming over a belt large 40 cm .

Define the ideal focal length for surely acquiring an entire object, with at least 3 cm of exceeding tolerance in the direction of the motion, when the camera is elevated at 1.5 m from the belt.

Suppose You have available lens with focal length 35 mm, 50 mm and 75 mm: **choose the best one** for working at the distance which best fits 1.8 m, **compute the correct height for positioning the camera**, and **compute the achievable resolution**.

With this set up, **which is the highest speed of the belt** for being sure that we may acquire an entire object, when the camera works at 100 fps?

Which is the size of the smallest detectable defect, if the defect resolution requires at least 10 pixel for being correctly analysed by your software?