

# Introduction to Computer Vision

ISAE-SUPAERO

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## 1 Basics

► **Question 1** *Remind the principle of pseudo-inverse approach.*

Now you observe a positions of an asteroid at different times and the objective is to estimate its trajectory.

► **Question 2** *Complete the program 'AsteroidTraj' to estimate the asteroid trajectory. Detail the theoretical approach.*

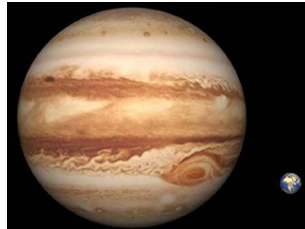
## 2 Shape-Based Approaches

► **Question 3** *Recall basic principle of shape detection in Computer Vision.*

Now, let us consider one planets to be detected and characterised (Fig. 1) in 3 different configurations.



Conf. 1



Conf. 2



Conf. 3

Figure 1: Planets

► **Question 4** *Detect & Characterise (Position, size) the 1st planet in Conf. 1.*

► **Question 5** *What's happen with Conf. 2 and Conf. 3?*

## 3 Contour-Based Approaches

► **Question 6** *Extract the planet (Conf. 1) using  $N$  points and next a Pseudo-Inverse Approach. What's happen in other configurations?*

- **Question 7** *Extract the planet (Conf. 1) using  $N$  points and next a Pseudo-Inverse Approach. What's happen in other configurations?*
- **Question 8** *Extract the planet (Conf. 1) using a Optimisation algorithm. What's happen in other configurations?*
- **Question 9** *Explain the RANSAC Algorithm. Use it in the Conf. 2 and Conf. 3.*
- **Question 10** *Compare with the circular Hough Transform*