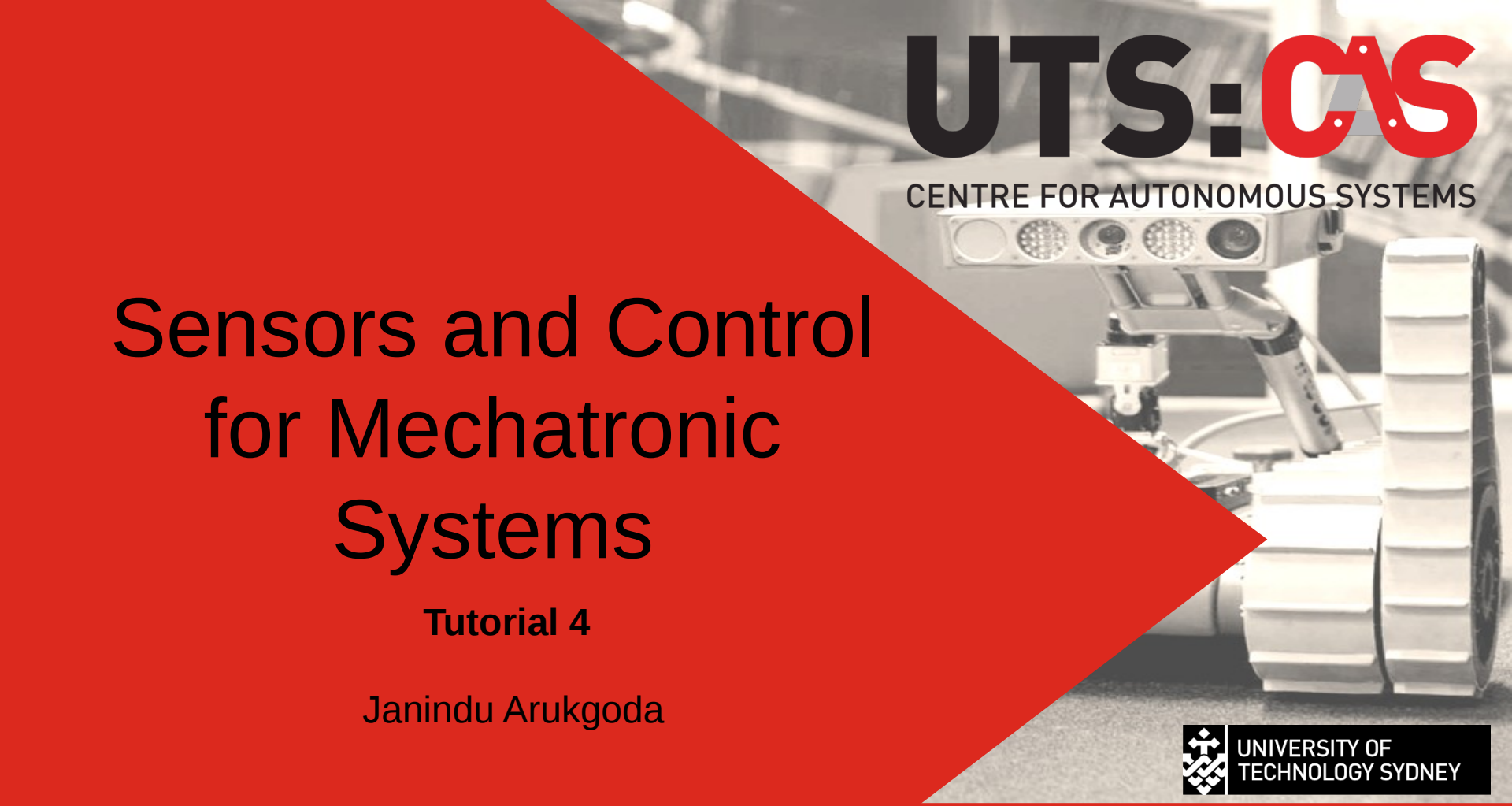
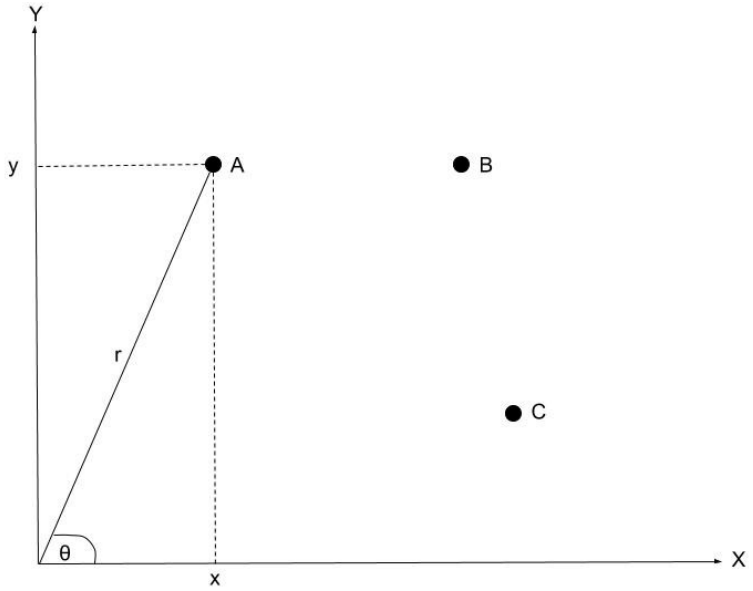


Sensors and Control for Mechatronic Systems

Tutorial 4

Janindu Arukgoda

Converting Range-Bearing Readings to Cartesian Coordinates



Converting Range-Bearing Readings to Cartesian Coordinates

$$x = r * \cos(\theta)$$
$$y = r * \sin(\theta)$$

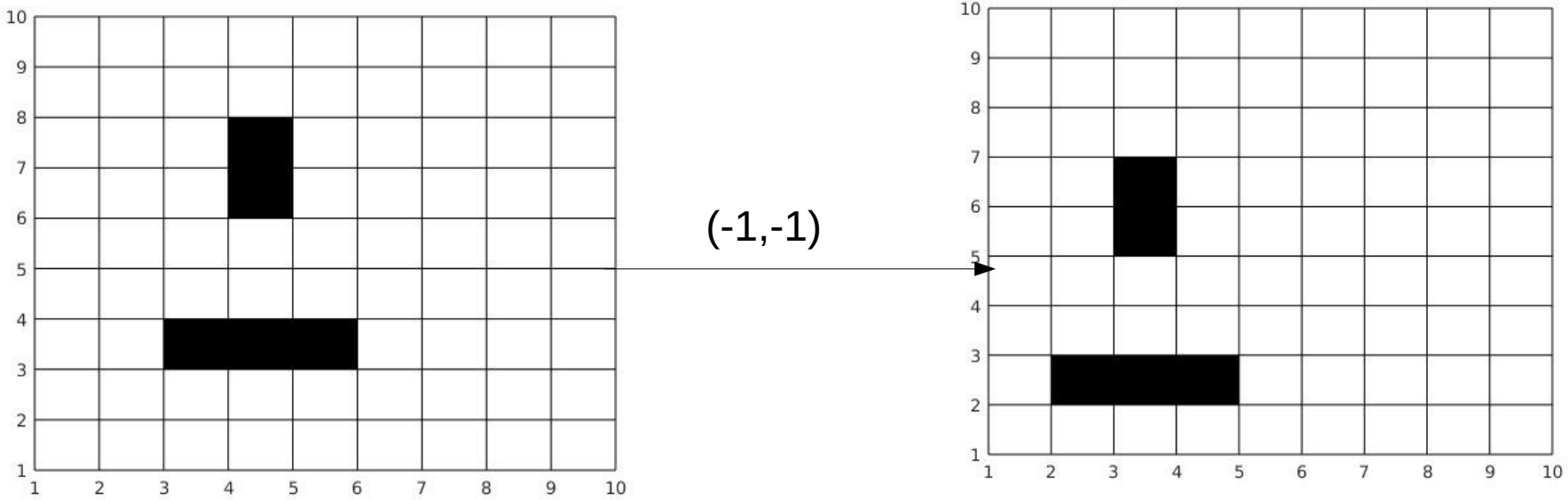
Converting Range-Bearing Readings to Cartesian Coordinates

$$r = \mathrm{sqrt}(x^2 + y^2)$$
$$\theta = \tan^{-1}(x/y)$$

Transformation between two laser scans

- Robot transformation between times T_1 and T_2 can be calculated by aligning the laser scans obtained at times T_1 and T_2.
- Rigid body transformation consists of two components, translation and rotation.

Transformation



Rotation