¡Felicitaciones! ¡Aprobaste!

Calificación recibida 100 % **Para Aprobar** 75 % o más

Ir al siguiente elemento

Module 3: Graded Quiz

Calificación de la entrega más reciente: 100 %

1. Which of these statements are true? Select any/all that apply: 1 / 1 punto

- [x] Every unit quaternion has an associated 3x3 rotation matrix.

Correcto
Correct! Every quaternion corresponds to a 3x3 rotation matrix.

- [ ] Every 3x3 matrix represents a 3D rotation.
- [x] Every set of Euler angles corresponds to a unit quaternion.

Correcto
Correct! Any set of Euler angles represents a rotation which can also be represented by a unit quaternion.

2. Which of these are valid rotation matrices? Select any/all that apply: 2 / 2 puntos

- [x] $C_2 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ 0 & -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{bmatrix}$

Correcto
Correct! $C_2 C_2^T = \mathbf{I}$ holds and $\det C_2 = 1$.

- [ ] $C_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ 0 & \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{bmatrix}$
- [x] $C_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Correcto
Correct! Since C_1 is an identity matrix, it is equivalent to performing "zero" rotation.

- [ ] $C_4 = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$

3. Localization can be performed on board a vehicle by integrating the rotational velocities and linear accelerations measured by an IMU. Assuming that the IMU measurement noise is drawn from a normal distribution, what will the pose estimation error look like? 1 / 1 punto

- (•) The vehicle pose estimation error will grow with time.
- ( ) The vehicle pose estimate error will remain within a bounded interval.
- ( ) The vehicle pose estimate error will decrease with time.

Correcto
Correct! Since we are integrating noisy measurements, the error will build up over time.

4. Each GPS satellite transmits a signal that encodes: **1 / 1 punto**

- ○ The receiver's position and time of signal transmission
- ◉ The satellite's position and time of signal transmission.

Correcto
Correct! This information can be used to calculate the vehicle's position.

5. Which of these systems provides the most accurate positioning measurement? **1 / 1 punto**

- ◉ RTK GPS
- ○ GPS
- ○ DGPS

Correcto
Correct! RTK uses phase of the GPS carrier signal to provide centimetre-level accuracy.

6. What is the minimum number of GPS satellites required to estimate the 3D position of a vehicle through trilateration? **2 / 2 puntos**

4

Correcto
Correct! A minimum of four satellites is required to unambiguously calculate the vehicle's 3D position.