IIOT enfocado en el desarrollo de visión de profundidad en un AGV

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Índice

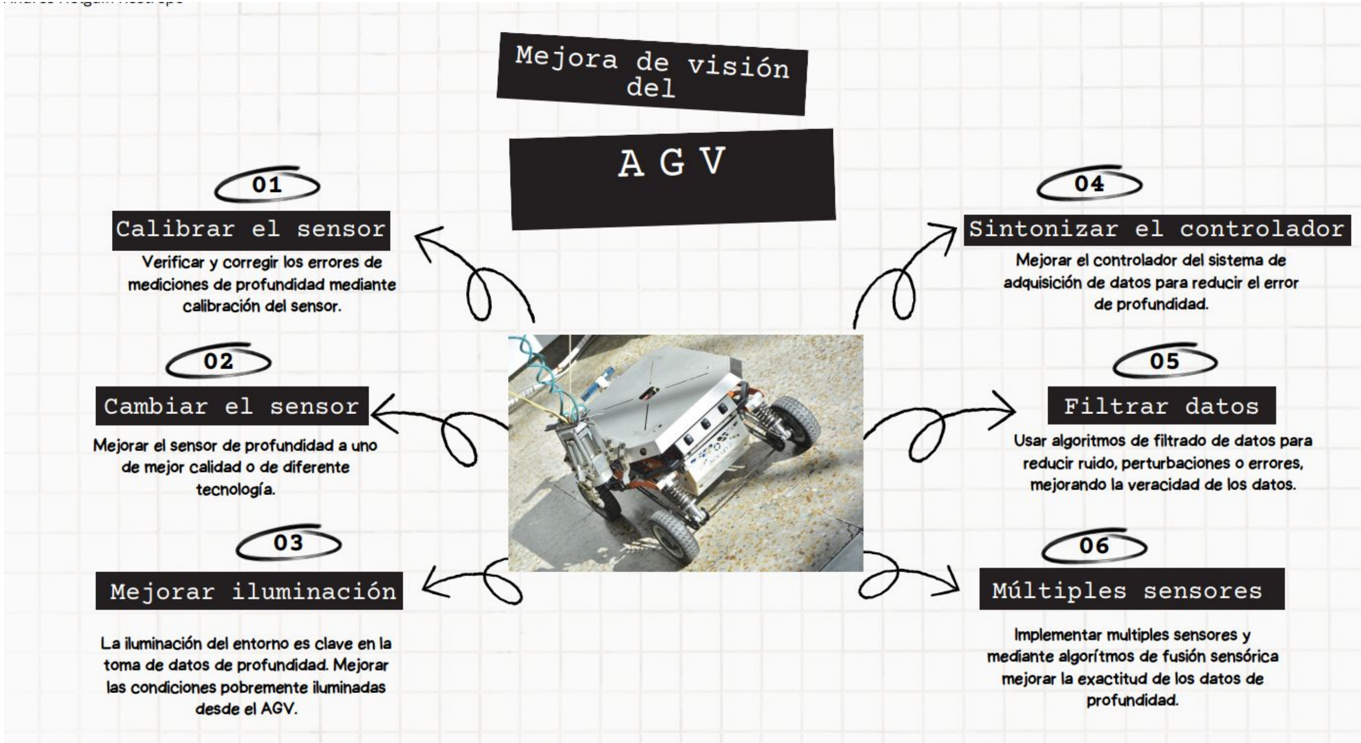
[1]

IIOT

Integración de dispositivos y sistemas de carácter industrial en una red de comunicación.

- Edge Computing
- Mantenimiento predictivo
- Análisis de Big Data Industrial
- Ciberseguridad
- Robótica industrial
- Redes eléctricas inteligentes
- Monitoreo remoto

Implementación cámaras realsense en SDVs



Papers relacionados

Cloud Computing Fuzzy Adaptive Predictive Control for Mobile Robots

Fuzzy logic based mobile robot target tracking in dynamic hostile environment

Tracking Control For Wheeled Mobile Robot Using RGBD Sensor

Cloud Computing Fuzzy Adaptive Predictive Control for Mobile Robots

[2]

Objetivos y Cloud computing

Lograr el seguimiento de trayectorias en tiempo real y evitar obstáculos con control de movimientos de carácter elípticos.

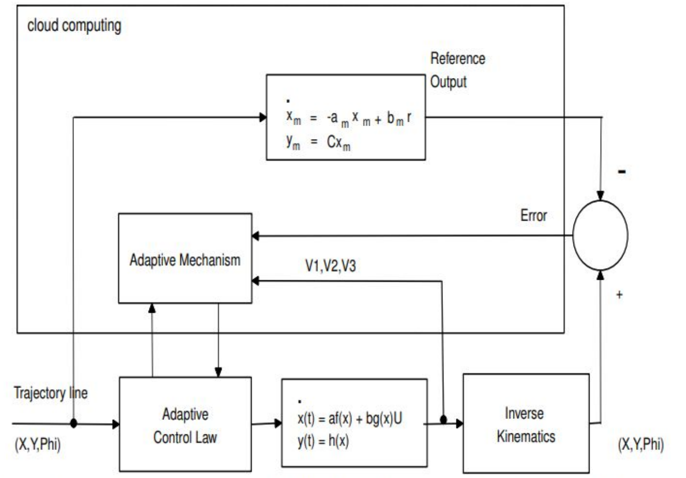


Fig. 5. The structure of the cloud computing fuzzy adaptive predictive control. Dynamic System)

[2]

Resultados

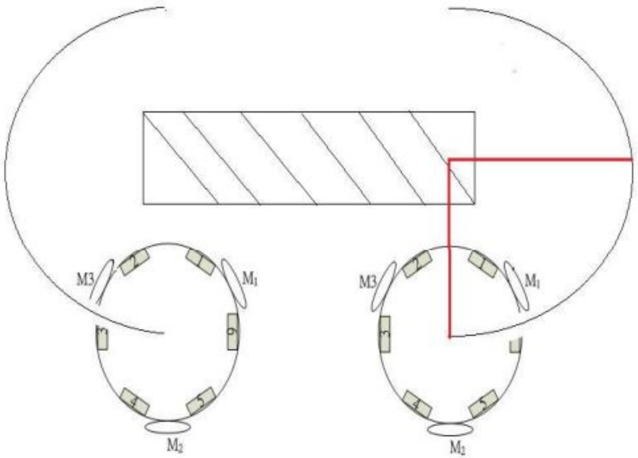


Fig. 7. Relative Position Schematic Diagram [2]

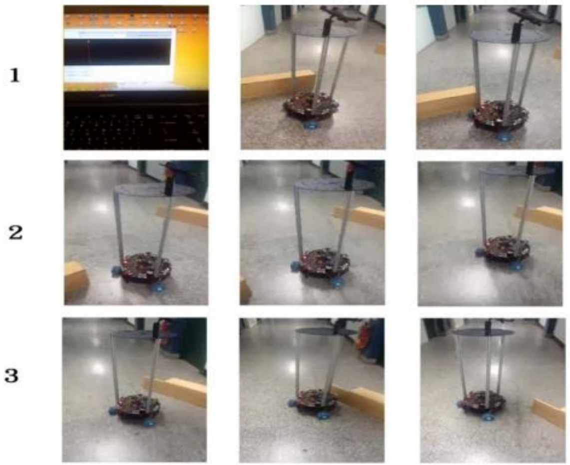
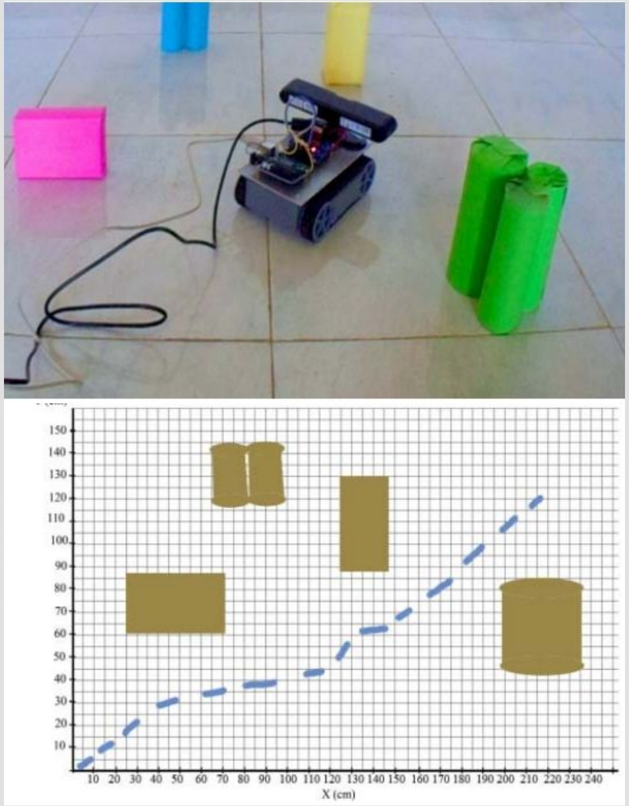


Fig. 8. Obstacle avoidance experiments with fuzzy adaptive controller [2]

Fuzzy logic based mobile robot target tracking in dynamic hostile environment



[3]

DAQ y dirección objetivo

Figure 1 (a): RGB image

Figure 1 (b): Depth image

[3]

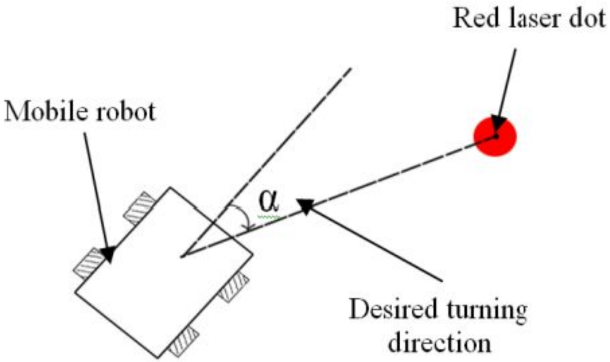


Figure 3: Target direction

[3]

Control difuso

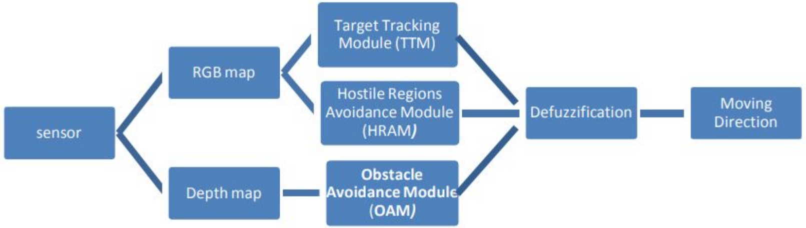


Figure 2: fuzzy logic based navigation controller

[3]

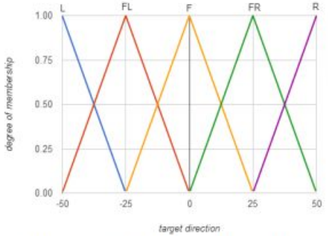


Figure 5: Membership function for angle

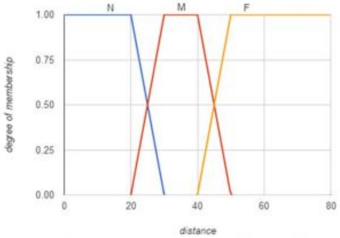


Figure 6: Membership function for distance

[3]

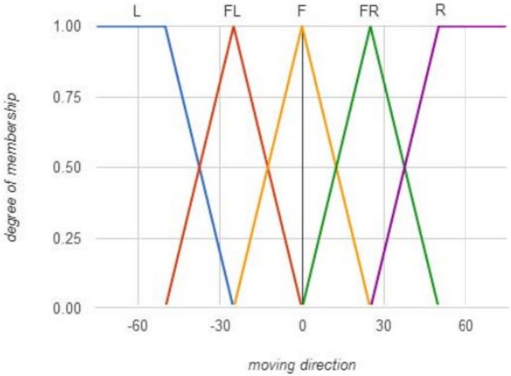


Figure 9: Membership function for moving direction

$L_{moving\_direction} = \{L, FL, F, FR, R\}$

[3]

Resultados

Figure 11 (a): Dynamic environment with a specified target

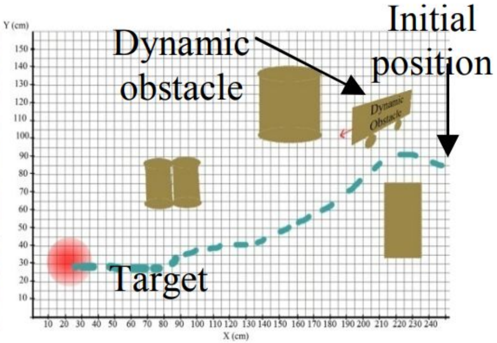


Figure 11 (b): Path taken by the robot

[3]

Figure 13 (a): Hostile environment with two targets

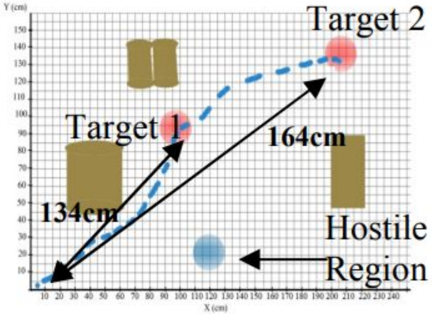


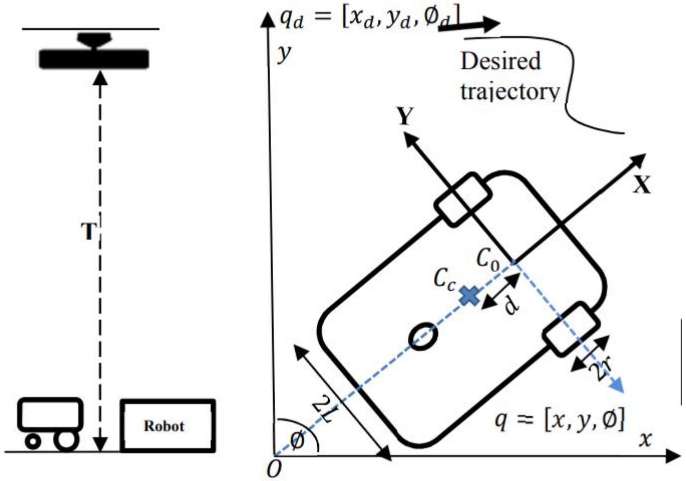
Figure 13 (b): Path taken by the robot

[3]

Tracking Control For Wheeled Mobile Robot Using RGBD Sensor

[4]

Configuración del espacio



a) b)

Fig. 1 a) A general description of the system. b) The Mobile robot as seen from the depth camera.

[4]

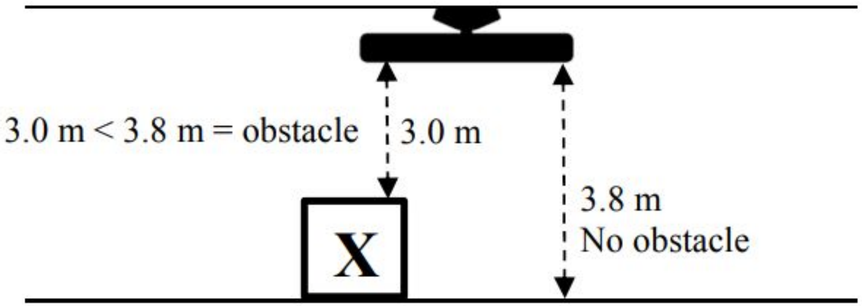


Fig. 4 Obstacle detection

[4]

Adquisición de datos y planificación de rutas

Detección de obstáculos

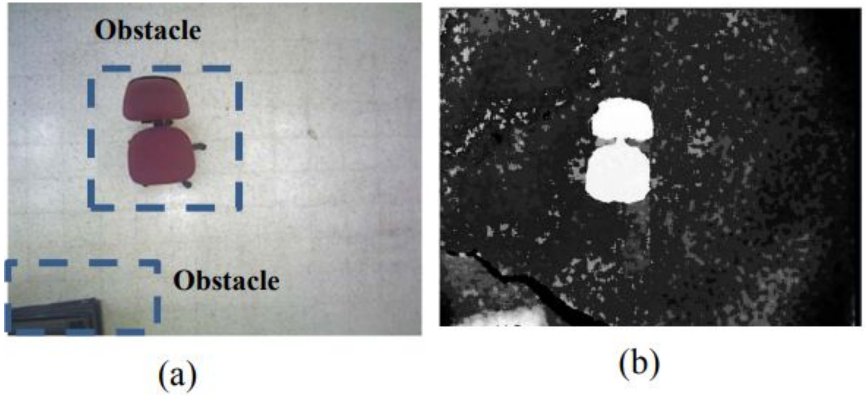


Fig. 9. Vision information. (a)RGB image captured by the ASUS Xtion Pro.
(b) Raw depth image captured by the ASUS Xtion Pro.

[4]

Probabilistic Roadmap path planning algorithm (PRM)

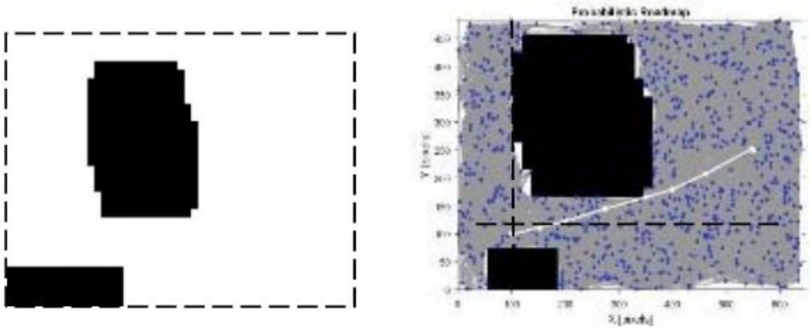


Fig. 10. Path planning. The scene converted to a binary image. (b) PRM path

[4]

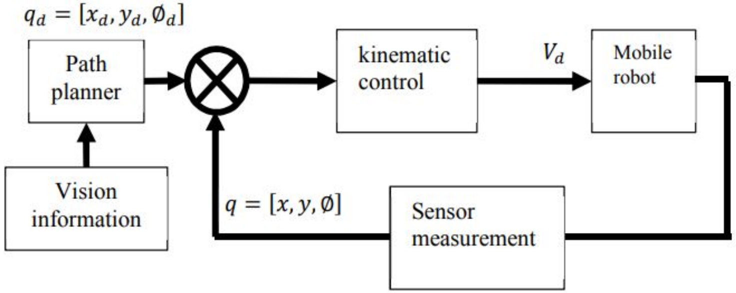
Control y red de comunicación

Ecuación diferencial del sistema

$$M(q)\ddot{q} + C(q,\dot{q})\dot{q} + G(q) = B(q)\tau - A^T(q)\lambda$$

$$V(t) = \begin{bmatrix} v \\ \omega \end{bmatrix} = \begin{bmatrix} k_1\tilde{x} + v_d cos\tilde{\phi} \\ \omega_d + k_2 v_d \tilde{y} + k_3 v_d sin\tilde{\phi} \end{bmatrix}$$

Diagrama de bloques



[4]

Fig. 2 control design

Red de comunicación

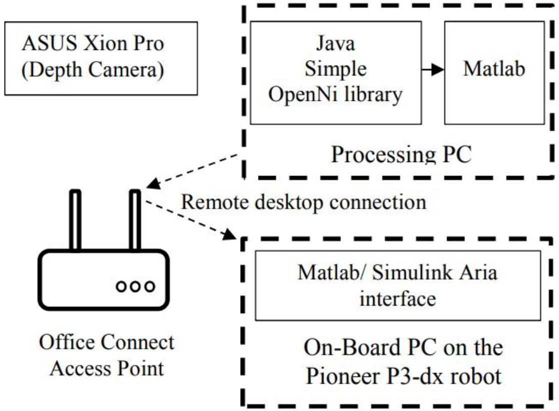


Fig. 8. Experimental steup

[4]

Resultados

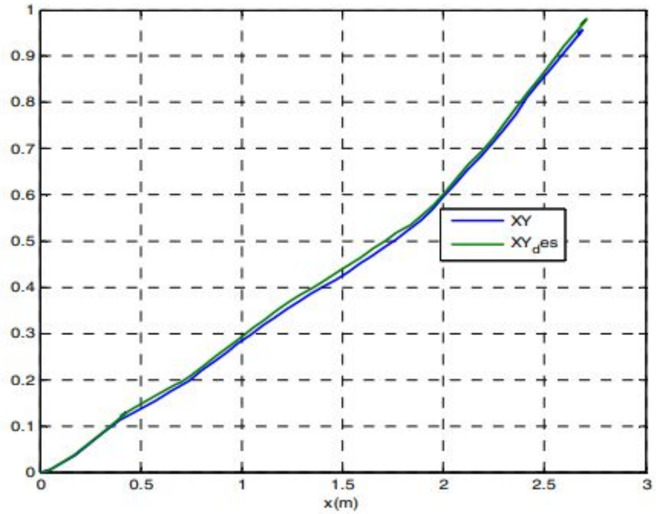


Fig. 13. Tracking trajectory in (X, Y) plan.

[4]

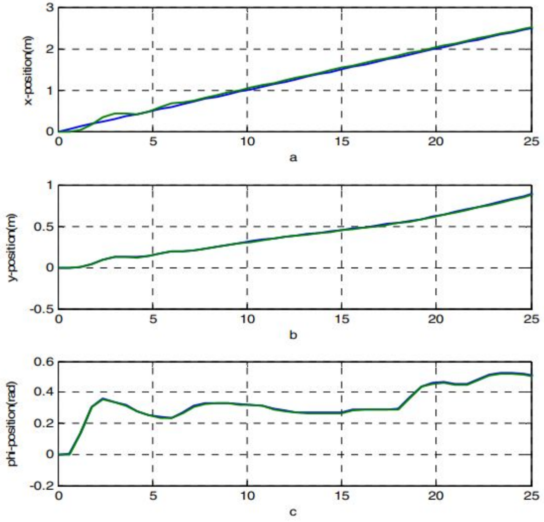


Fig. 11. Tracking control for mobile robot. (a) Tracking trajectory of x-position, (b) Tracking trajectory of y-position (c) Tracking trajectory of ϕ-direction.

[4]

Conclusiones

- A partir de los avances de la IIOT, se han podido desarrollar avances tecnológicos en la comunicación de dispositivos y servicios para optimizar procesos industriales.
- Los sensores de profundidad son capaces de generar la información necesaria para poder desarrollar trayectorias óptimas en robots móviles.
- El uso de controladores difusos ha ayudado al control de AGVs en espacios con obstáculos estáticos y dinámicos.

Referencias

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[3] Fernando, T., Gammulle, H., & Walgampaya, C. (2015, July 14). Fuzzy logic based mobile robot target tracking in dynamic hostile environment. *2015 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications, CIVEMSA 2015*. https://doi.org/10.1109/CIVEMSA.2015.7158609

[4] Fareh, R., Rabie, T., & Baziyad, M. (2017). Tracking Control For Wheeled Mobile Robot Using RGBD Sensor. 2017 4th International Conference on Control (CoDIT'17).