

# Critical Systems and Applications of RTOS

Name

Universidad Panamericana

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# Critical Systems and Applications of RTOS

- Discussion of RTOS applications in critical systems across various industries
  - **Aerospace and Aviation** (e.g., General Electric, Hydra)
  - **Automotive** (e.g., Continental, NXP, Avnet)
  - **Healthcare** (e.g., Plexus, Baxter)
  - **Power Generation** (e.g., Baker Hughes, CERN)
  - **Telecommunications** (e.g., Cinvestav, Qualcomm)
  - **Defense and Military** (e.g., Hydra, A2E)

# Aerospace and Aviation

# General Electric

- Flight control systems, engine management, and in-flight entertainment systems.
- Santiago de Queretaro **General Electric Aeroespace**
- Europe Aeroespace **DLR**
- Hydra technologies **Hydra**
- A2E technologies (Guadalajara) **A2E technologies**
- DO-178C Software Considerations in Airborne Systems and Equipment Certification.
- Examples include managing real-time data from multiple sensors and executing complex algorithms for autopilot systems.

# Hydra

# Hydra

## Automotive Industry



# Automotive Industry

- AUTOSAR (Automotive Open System ARchitecture), provides a standardized architecture for automotive software, facilitating the integration of RTOS into diverse automotive applications.
- Engine controls, safety systems, and infotainment systems.
- Advanced driver-assistance systems (ADAS) and autonomous driving technologies.
- AutoSAR stack

# Healthcare

# Healthcare

- Healthcare systems rely on RTOS for the management of critical medical devices such as ventilators, infusion pumps, and diagnostic systems.
- These systems require absolute reliability and precision, where timing is often critical to patient care outcomes.
- RTOS ensure that the medical devices operate under strict timing constraints, providing consistent and reliable performance.

# Power Generation

# Power Generation

- Orbit60
- RTOS are integral to managing operations in power generation and distribution, ensuring stability and efficiency in the power grid.
- They handle real-time monitoring and control of power systems, adjusting loads and generation in response to real-time demand changes.
- This real-time capability is vital for integrating renewable energy sources effectively, where power supply can be intermittent and variable.

# Telecommunications

# Telecommunications

- In telecommunications, RTOS manage critical real-time operations such as signal processing, data routing, and session management.
- Their ability to handle high-speed data with low latency supports the reliability and quality of voice, video, and data transmission across networks.
- RTOS also enhance the scalability and adaptability of network infrastructures to meet changing data traffic demands.

## Defense and Military



# Defense and Military

- Compliance with ITAR (International Traffic in Arms Regulations) is crucial, ensuring that defense technologies including those powered by RTOS adhere to strict export control laws, maintaining national security.
- The defense sector utilizes RTOS for systems requiring robust, real-time responses such as weaponry, surveillance, and communication systems.
- General Electric Aerospace

# Thank you!