ACCELERATION ROBOTICS

Press Release

3rd of October, 2024

Víctor Mayoral-Vilches (**e-mail**)
(+34) 616151561
VITORIA-GASTEIZ, Spain

Human-Robot Interaction Without Aggression. Hardware-Accelerated Dynamic Collision Avoidance Collaborative Behavior

Acceleration Robotics Announces the Launch of ROBOTCORE® Collaborative to ensure Safe and Seamless Collaboration Between Humans and Robots with Unmatched Speed and Precision

VITORIA-GASTEIZ, Spain – Acceleration Robotics, a leading robotics semiconductor startup based in the Basque Country, Spain, today announced the release of **ROBOTCORE® Collaborative**, a cutting-edge Human-Robot Interaction (HRI)-centric hardware solution that redefines the safety, speed, and efficiency of collaborative robotics. By incorporating advanced FPGA technology and a hardware-accelerated control system, ROBOTCORE® Collaborative ensures real-time dynamic collision avoidance, guaranteeing that robots and humans can work together seamlessly in shared workspaces without collisions or aggressive behaviors.

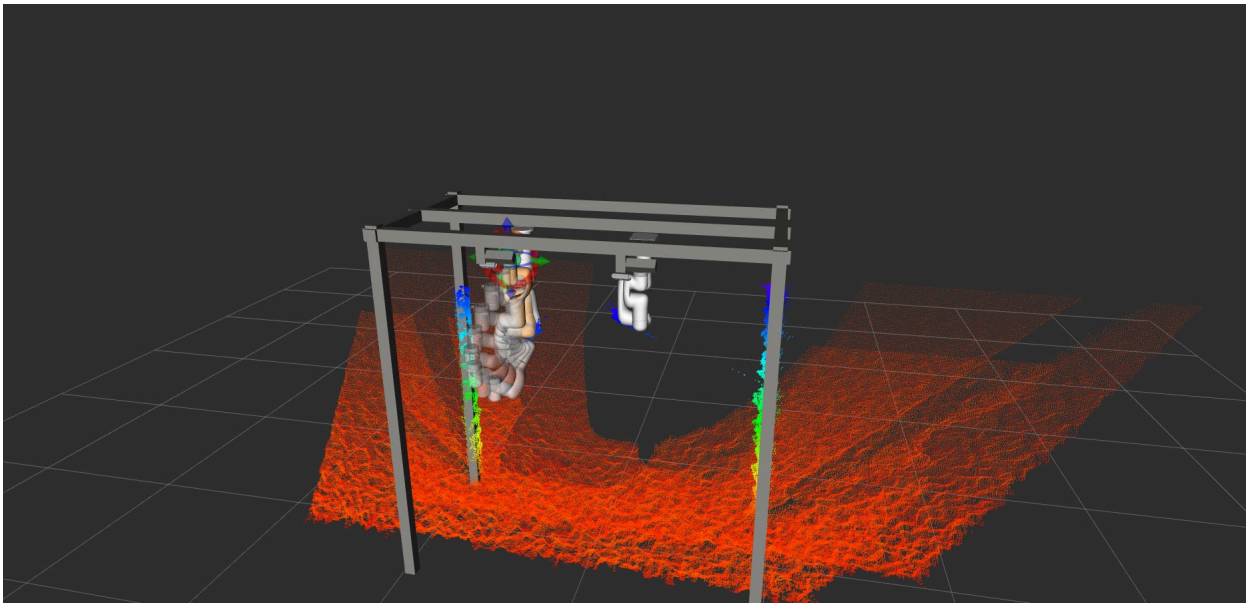
Unparalleled Safety in Collaborative Robotics

ROBOTCORE® Collaborative harnesses the power of **Artificial Potential Field (APF)-based control** and hardware acceleration to deliver **microsecond-level response times**, which are critical for preventing collisions and aggressive movements in industrial and dynamic environments. With this breakthrough, Acceleration Robotics offers an advanced platform that ensures **deterministic behavior**, even in unpredictable scenarios. By enabling real-time adjustments based on sensor data, the technology ensures a smooth and safe collaboration between robots and humans, transforming robotic arms into advanced collaborative systems.

"**ROBOTCORE® Collaborative is a game-changer in the realm of human-robot interaction**," said Victor Mayoral Vilches, founder of Acceleration Robotics. "Our hardware-accelerated

approach offers the speed and determinism necessary to create truly collaborative environments where safety and performance are paramount."

Key Features of ROBOTCORE® Collaborative



- **Dynamic Collision Avoidance**: The system leverages real-time data from depth cameras and sensors to detect obstacles and adjust the robot's movements instantly, ensuring safe interaction.
- **Hardware-Accelerated Control**: Powered by FPGA technology, ROBOTCORE® Collaborative provides rapid, real-time responses that outperform traditional CPU-based systems, ensuring microsecond-level latency.
- **ROS 2 Compatibility**: Fully API-compatible with the ROS 2 control stack, this solution integrates seamlessly into existing robotic systems, making it easy for developers to enhance their robots with advanced collaborative behaviors.
- **Occlusion Handling**: Multiple cameras extend the coverage of the robot's environment, allowing the system to handle occlusions and ensure continued safe operation even when some visual data is blocked.

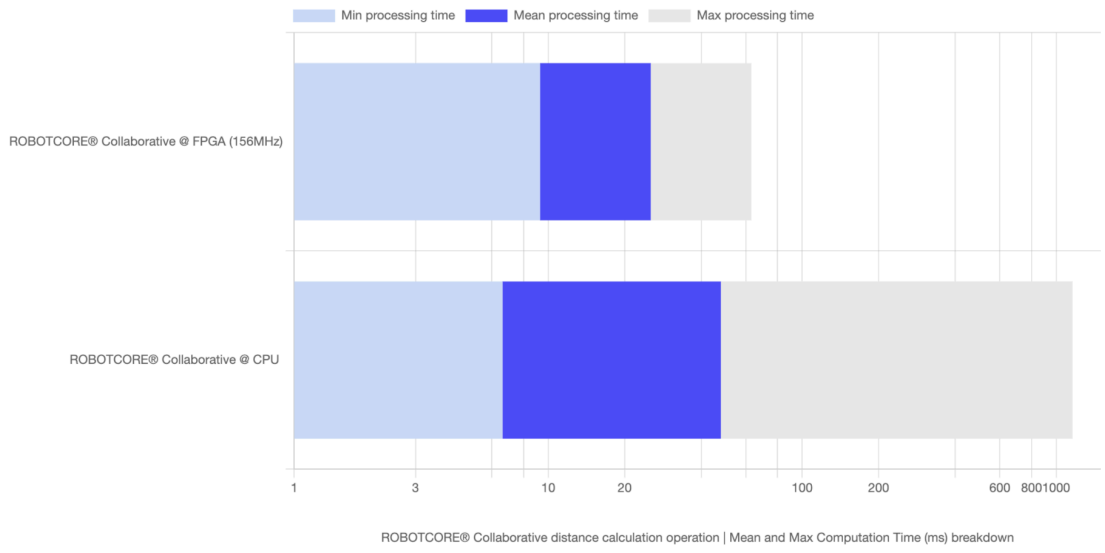
Víctor Mayoral-Vilches (**e-mail**)
(+34) 616151561
VITORIA-GASTEIZ, Spain

Versatility Across Industries

ROBOTCORE® Collaborative is designed to meet the demands of a variety of industries, where safety, efficiency, and seamless human-robot interaction are critical:

- **Manufacturing**: Enhances productivity and safety by enabling robots to work side by side with humans on assembly lines.
- **Healthcare**: Facilitates safe collaboration between medical professionals and robots in surgical and caregiving environments.
- **Warehousing and Logistics**: Ensures the safe coexistence of human and robotic workers in fast-paced, dynamic environments.
- **Research and Development**: Provides a robust platform for advancing human-robot interaction technologies in academic and industrial research settings.

Unmatched Performance Powered by Hardware Acceleration



ROBOTCORE® Collaborative distance calculation operation | Mean and Max Computation Time (ms) breakdown

Compared to software-based solutions, ROBOTCORE® Collaborative delivers **up to 29.49x faster** processing times, reducing the average processing time to **37.7 milliseconds** on FPGA, compared to over **1112 milliseconds** on conventional CPUs. This level of performance is

essential for real-time decision-making in collaborative robots (cobots), where precision and speed directly impact safety and efficiency.

Dynamic Collision Avoidance: The Future of Collaborative Robotics

ROBOTCORE® Collaborative introduces a new era of intelligent robotic systems that can navigate complex environments with ease. By leveraging **depth image-based control** and real-time data from multiple cameras, the system ensures accurate obstacle detection and avoidance, making it ideal for environments where human safety is critical.

For more information about **ROBOTCORE® Collaborative**, visit Acceleration Robotics or contact us to learn how this groundbreaking technology can enhance your industrial or research robots.

About Acceleration Robotics

Acceleration Robotics is a firm focused on designing customized brains for robots to hasten their response time. Founded by top robotic experts to deliver semiconductor building blocks for robots, the company leverages GPUs a
nd FPGAs to create custom hardware that speeds up a robot's operation.