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NEWSLETTER 4/2024

TALON PROJECT



TALON

Autonomous and self-organised artificial intelligent
orchestrator for a greener industry 5.0

talon-project.eu

EDITORIAL

T This newsletter presents a summary of the primary dissemination outcomes of the project, which include journal and conference publications, as well as organization of events. Specifically, two (2) project developments by TALON partners, and one (1) joint webinar.

Stylios Trevlakis, InnoCube

2ND WORLD CONFERENCE ON EXPLAINABLE ARTIFICIAL INTELLIGENCE

📢 Exciting news from the TALON project in the 2nd World Conference on eXplainable Artificial Intelligence (xAI-2024)!

UBITECH and Ericsson have just released their groundbreaking paper, "On Explaining and Reasoning about Fiber Optical Link Problems." 🌐💡

This collaborative work addresses the critical issue of optical fiber link problems that lead to data transmission errors and network performance degradation. 🔧🔗

Key highlights:

1. **Diagnosis of Optical Fiber Issues:** The paper delves into common issues like physical extrusion, excessive bending, and insufficient power that disrupt signal quality.
2. **SHAP Methods:** It introduces SHAP methods to enhance transparency and interpretability in AI, helping us understand the factors behind optical link problems.
3. **Dual Approach:** It offers two innovative solutions:
 - a) **Local Explanations:** Providing specific explanations for individual decisions using a model-agnostic approach.
 - b) **Global Explanations:** Describing the overall logic of opaque AI models, assuming some knowledge of their inner workings.

Stay tuned as we unravel the complexities of fiber optics with AI! 🔍💡

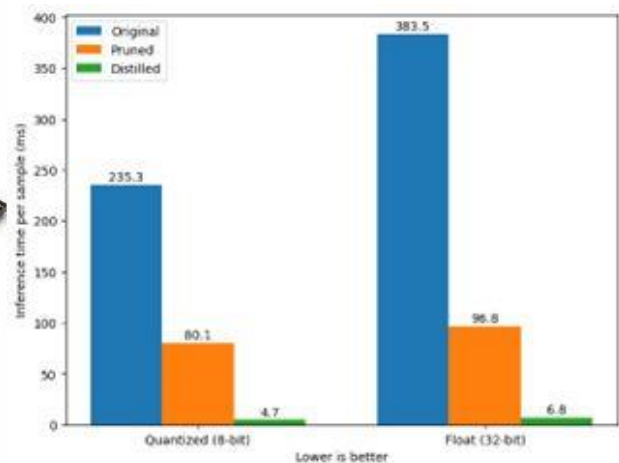
AI@EDGE

The Department of Computer Science, which belongs to the School of Sciences based in Kavala, Greece (formerly part of the International Hellenic University and now part of the Democritus University of Thrace), participates in TALON by remaining very active in researching the performance, consumption, and overall behavior of processing AI tasks on Edge devices, as a significant aspect of the Industry 5.0 paradigm of the project.

Our team has recently started researching and evaluating Deep Learning compression methods on Edge class devices. This is a work in progress, with the early results demonstrating the potential of deep learning compression methods (quantization, weight pruning, and knowledge distillation) in terms of efficiency and accuracy, when it comes to the execution of different AI models on Edge devices like the Nvidia Jetson.

This research is now triggering novel approaches in optimizing AI task orchestration at the Edge, with the related methodology and results being upcoming.

The Department of Computer Science, through the Laboratory of Industrial and Educational Embedded Systems, continues to be fully dedicated to actively supporting the TALON project's goals.



AI@AR/VR

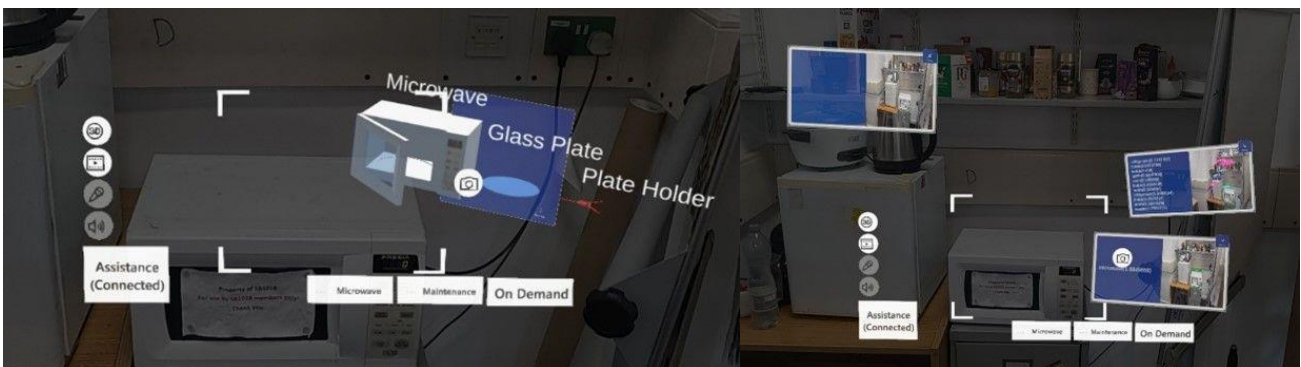
The Kingston University (KU) team is currently at the forefront of the TALON project, pioneering advancements in the integration of Artificial Intelligence (AI), Augmented Reality (AR), and Virtual Reality (VR) technologies within maintenance operations, ushering in the era of Greener Industry 5.0.

Maintenance personnel, equipped with cutting-edge AR devices, step onto the factory floor. Their AR glasses overlay digital information onto the machinery, providing real-time diagnostics and maintenance instructions. As they navigate through the plant, AI algorithms assist in identifying potential issues, from irregular vibrations to temperature fluctuations, enhancing predictive maintenance efforts.

In a remote office, support personnel monitor the maintenance process via their computers. Leveraging the power of AI, they analyze data streams transmitted from the AR devices worn by the on-site technicians. Through seamless communication channels, they provide guidance and troubleshooting assistance, ensuring that maintenance tasks are performed efficiently and accurately.

AR not only aids in maintenance tasks but also serves as a platform for remote collaboration. Maintenance personnel can share their field of view with off-site experts, allowing for immediate assessment and resolution of complex issues. This collaborative approach not only enhances efficiency but also reduces the need for travel, minimizing carbon emissions and contributing to sustainable practices.

The integration of AR, AI, and remote support personnel exemplifies the KU team's dedication to revolutionizing industrial maintenance practices. By leveraging these technologies, they empower industries to adopt proactive maintenance strategies, reducing downtime, optimizing resource utilization, and ultimately minimizing environmental impact.





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