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VERSATILE INTELLIGENT PORTABLE PLATFORMS VIPRO FOR DEVELOPING THE IT INDUSTRY 4.0 CONCEPT

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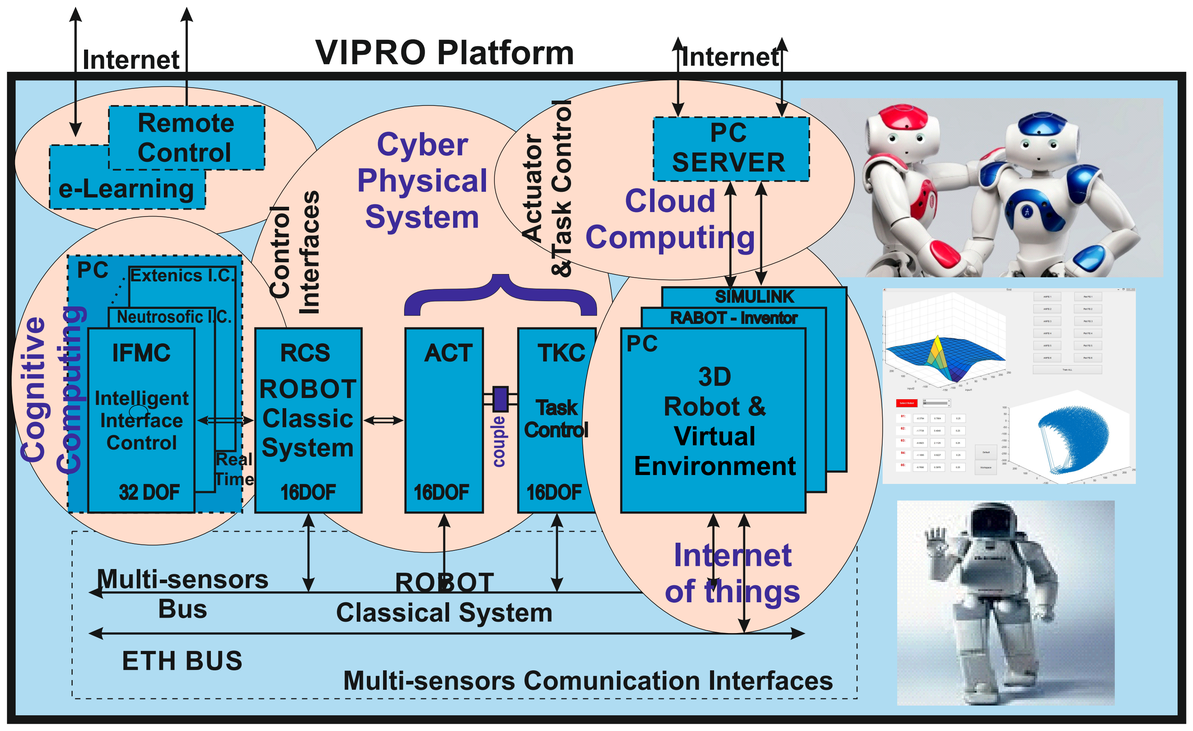
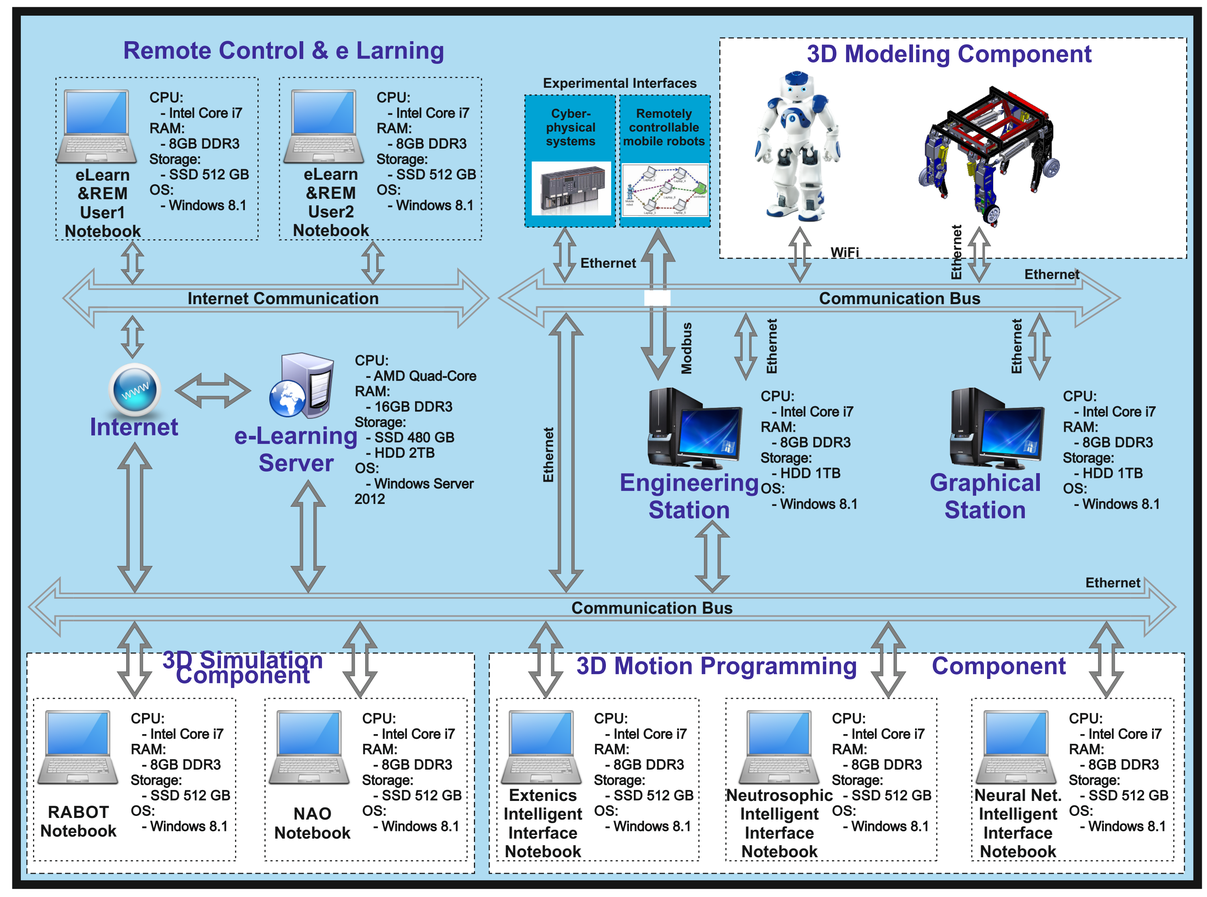
VIPRO concept

VIPRO Platform concept develops the versatile, intelligent and portable control interfaces in the virtual reality environment, validated in real time on a classical own mechatronic control system and/or an own physical mechatronic system, with the aim of improving system performances for motion, navigation and orientation, having as main applications control systems for nano - micro - macro -manipulators, mechatronic and humanoid systems.

VIPRO concept enables developing the IT Industry 4.0 concept through the design, testing and experimentation of new intelligent control interfaces on a classical mechatronic control system (SCMC) in the presence of the physical mechatronic system (SMF), with own control system and mechanics structure, or in the absence thereof, without the need to modify its hardware structure, and, from optimal decisions and information fusion between the intelligent control interfaces, resulting in a high degree of versatility and portability to a global communications network.





An original virtual projection method is applied to SMOOTH firefighting robots, through representation of the intelligent mobile robots in a 3D virtual environment using a strong robotic simulator, an open architecture system and adaptive networks over the classical control system of the robot.
The system is designed for motion and navigation on rough terrain and uncertain environments, allowing rescue activities in crisis situations or natural disasters areas in which human life is in danger.

The portability of the intelligent control interface to a global communication network raises the economic impact and develops control performance for mechatronic systems through the worldwide participation of researchers and specialists from institutes, universities and research centres.

APPLICATIONS

The VIPRO platform is based on numerous inter-disciplinary studies with contributions in the fundamental research having technology capabilities in various fields: nuclear industry for the transportation of nuclear materials, medical assistance for the handicapped, agriculture and forest care, inspections in hazardous areas, nano-micro technologies, etc.

VIPRO Platform integrated in Industry 4.0.

VIPRo Versatile Intelligent Portable Platforms involves developing intelligent control interfaces by applying advanced control techniques adapted to the robot environment such Robot Neutrosophic Control (RNC), Robot Extenics Control (eHFPC), Robot Haptic Control (RHC), human adaptive mechatronics, etc., implemented by high speed processing IT&C techniques and real time communication for a high amount of processing data.

The portability characteristics allows the user, from anywhere in the world, to test and improve the motion performance of the mechatronic system, and furthermore implement the intelligent control and decision interfaces on their own control system, applying Industry 4.0 components: cognitive computing including intelligence and signal processing, cyber-physical systems, Internet of things and cloud computing.

ADVANTAGES

Together with the ability to function in a global communication network, the VIPRO Platform is competitive with other well-known IT virtual platforms, such as DMC virtual application platforms, ICGC Data Portal, TCGA Data Portal, NCI Genomic Data Commons (GDC), or the powerful worldwide platforms for CAD applications (SolidWorks), medical imaging reconstruction (Simpleware, Mimics), multiphysics numerical modeling (Comsol), mathematical and biomedical modelling (Matlab+ Simulink, Mathematica), virtual instrumentation and measurements (Labview), or virtual reality environment (Choreograph, Webots, USARSIM, V-REP).
Additionally to these, the VIPRO platforms developing the Industry 4.0 concept, by e-learning, remote control and intelligent control interfaces, will be entere on the IT market as a new component among existing IT platforms.

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