Realta` Virtuale e Aumentata: tecnologie per la Fabbrica 4.0

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Istituto di tecnologie industriali e automazione CNR-ITIA
ITIA-CNR, as a promoter of Industrial Innovation, performs strategic activities of Scientific Research and Technological Development for the Competitiveness and Sustainability of Italian and European Manufacturing Industries. The focus is on co-evolving Products/Services, Processes and Production Systems.
Development of the Human Oriented VIRTUAL FACTORY

Scientific Management
advanced industrial Engineering
Knowledge-based Manufacturing

Digital Engineering

Data Collection
Data Analysis
Feedback

Real factory as it is
Today

Future Virtual Factory as it will be
Tomorrow

Old factory structure as it was
Yesterday

PPS MRP

Digital Factory

Real-Time
Instructions Knowledge

Worker Satisfaction
Virtual Factory
The framework
Along the whole Factory life-cycle

Despite the granularity and the user

Between Real Factory and Digital factory

Along the whole Factory life-cycle

From interoperability … to Digital Continuity

Concept  Design  Planning  Deployment  Operation

Factory level
Cell level
Component

Digital
Real
Virtual Factory
The framework

Ontology-based approach:

1) Specific meta-models are endowed with an ontology interface to the meta-model of the Factory as a whole (T-box of classes, properties, restrictions)

2) The specific models (and corresponding software applications) implements an interface to the model of the Factory as a whole (A-box of individuals) to guarantee the interoperability in a star-network fashion
Virtual Factory
Industrial cases
DeManufacturing
Monitoring
VR/AR
Product Design
VR/AR
Product Design
VR/AR Processes

Pantograph

Warehouse
Assicurare la corda ai golfer
Inserire fermo meccanico
Prendere la brugola 10

> Svitare le viti del componente <
Lesson 1
screwing off the bolts

1. Open the door.
2. Get the electric screwdriver.
3. Screw off the bolt (3 of 6).

Lesson 2
measuring tyres pressure

1. Put back the electric screwdriver to its holder.
2. Open the cap on the holder of the chain of drawers.
3. Screw the joint to the valve.
4. Connect the electronic pressure gauge to the joint.
Selezione e conferma tramite sguardo

Riposizionamento automatico check-list

Anteprima oggetti

Smontaggio ruota

Indicatori in sovrainpressione
VR/AR Training

Vision system for supporting the operator during the setup of a lathe

- Natural features taken from the environment
- GUI for suggestions on which tool should be set-up and on current state
- Operations correctness check, features tracking in live videostream
- Automated control of process, based on features tracking
VR/AR Training
Become a member of Europe’s largest network of VR and AR professionals and benefit from our member services ...
Thanks for the Attention!!

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