



Benefits

- Virtual production validation without physical prototypes
- Improved process quality through early automated plausibility checks
- Acceptance of virtual technologies through intuitive interaction without need for CAD skills
- Haptically oriented workers can contribute to digital work place design
- Efficient design of work places for an aging workforce through immediate ergonomic assessment
- Reduced planning cost through faster, more accurate process modelling

Consortium

DAIMLER



<http://www.interact-fp7.eu>

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Interactive Manual Assembly Operations for the Human-Centered Work- places of the Future

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Duration: 36 months

<http://www.interact-fp7.eu>



Vision

Today, manual assembly processes are successively improved in production validation workshops. However, the optimization loop is split into text based and 3D geometric tools.

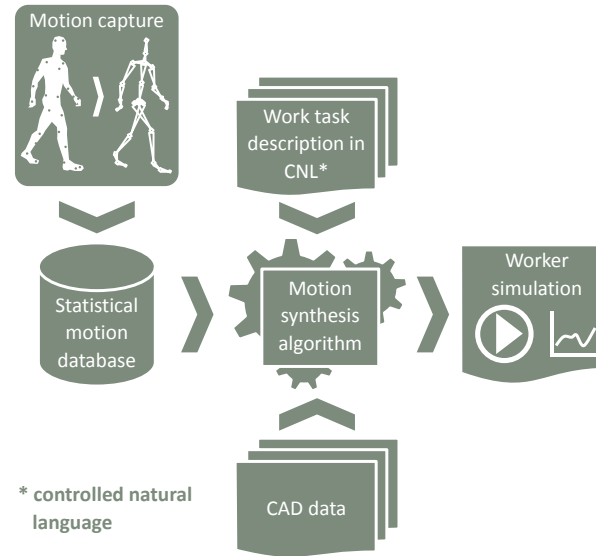
INTERACT bridges this gap by:

- Automatically generating 3D worker simulations from textual work task descriptions and CAD data.
- Interactively optimizing manual processes with sensor fusion based motion tracking.



Concept

Automatically generated worker simulations



Realistic worker movements are statistically generated from a motion capture database:

- Work tasks are derived from a controlled natural language. Each task comprises motion primitives that are modeled as statistical distributions.
- In order to control motions, constraints are derived from work task semantics, collision avoidance, manual input, and in-workshop sensor data.
- For in-workshop sensing, data from different types of low cost sensors is fused. An easy to use management platform minimizes setup effort.
- Modular Apps for portable devices are provided and managed by an Enterprise Application Platform.

Technology

Requirements

- Automatic derivation of motion building blocks from work task descriptions
- Best-fit simulation of worker motions that adapts to live workshop operations
- Low cost sensors for real-time tracking of human motions and objects in workshop environments
- Automatic semantic annotation and segmentation of tracked motions
- Tablet ready Apps for intuitive interaction between all workshop participants and the simulation model

Intuitive setting of new constraints for in-workshop adaptation of the simulation

- The motion synthesis algorithm automatically derives new constraints from multi-sensor fusion input.
- Intuitive interfaces include in-workshop modification of 3D trajectories and rewriting work task descriptions.

