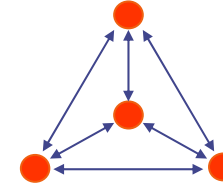


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LABORATOIRE DE CONCEPTION FABRICATION COMMANDE Design Engineering, Manufacturing and Control Lab

PRESENTATION

LCFC has been created in 2008 by grouping researchers belonging to several Metz's academic institutions and working in manufacturing, industrial engineering and control engineering.

RESEARCH TOPICS

Integrated Design, Control and Manufacturing for mechanical engineering are the main subjects of the researches. The aim is to control interaction product- process- resources for producing high quality mechanical parts:

- Control interaction part – process – resources in machining and grinding :behavior of the system part – tool –machine, choice of optimized cutting conditions, hard machining
- Integrated Design and Manufacturing of net-shape parts: forging, tooling
- Knowledge formalization for product-process integration : surfaces specifications, concurrent engineering, process planning, design of manufacturing systems, design process
- By doing Experiments on industrial equipments
- By modeling technical knowledge about the product, the process and the resources
- By using simulation of the manufacturing processes
- Robust Non Linear Control Law, Perturbation Rejection with Observers, Identification Methods for Mechanical Systems, Robot Design, Optimization of Biped Robots and Leg Prosthesis

KEY WORDS

Integrated design and manufacturing, product-process integration, part-tool- machine interaction, machining, forging, grinding, net shape parts, high performance tooling, manufacturing systems, tolerancing, process planning, virtual manufacturing, simulation of processes, concurrent engineering, FSW , NL robust control, complex mechanical systems, robotics

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COLLABORATIONS

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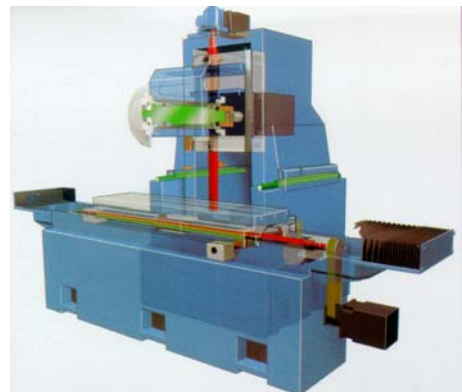
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SOME EXAMPLES OF EQUIPMENTS AND RESEARCH WORKS

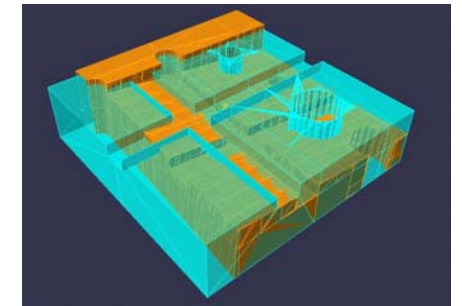


Creep-feed grinding machine : 50 kW

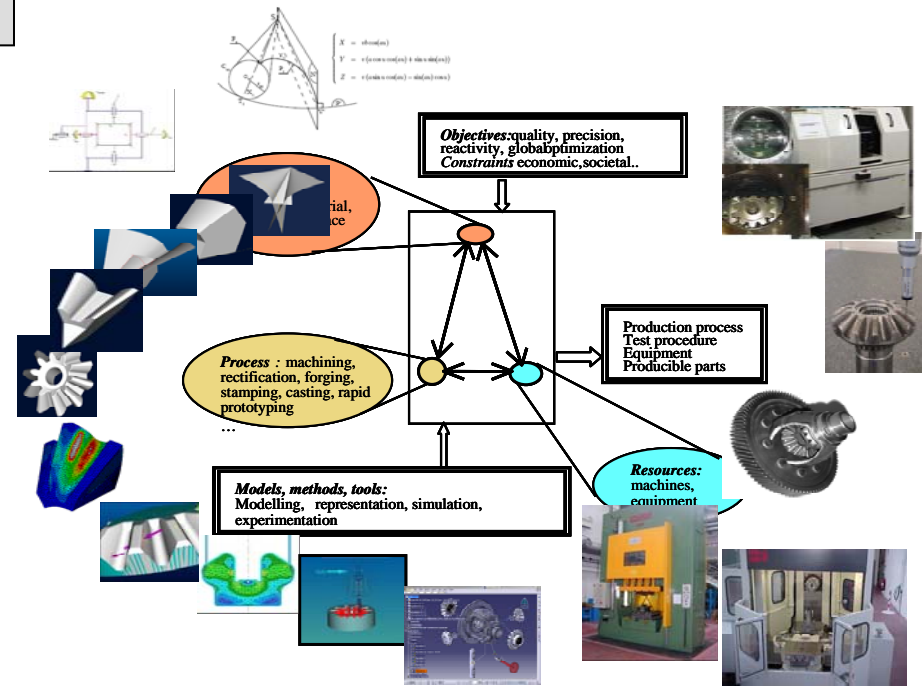
High speed spindle: 140000 rpm



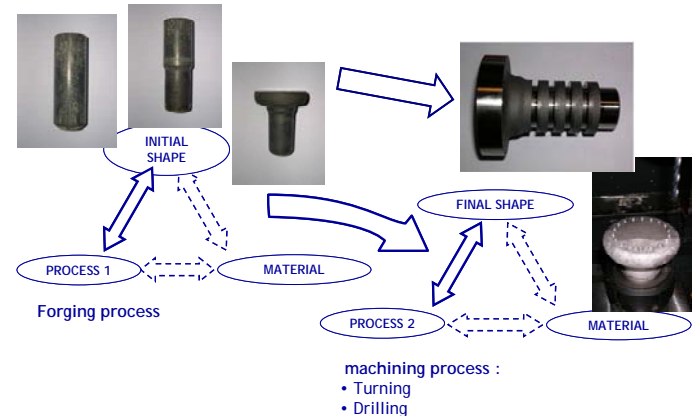
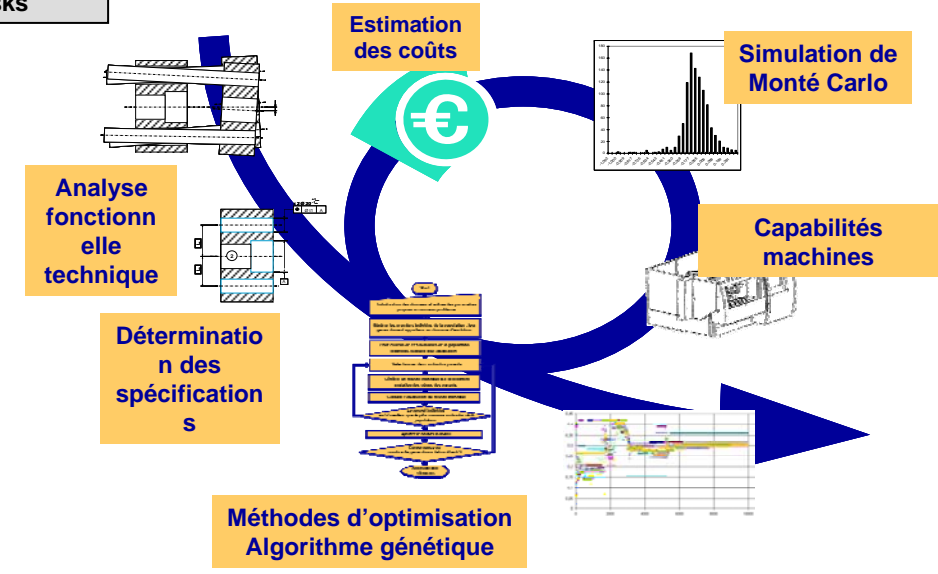
Virtual manufacturing: Geometrical quality of machining part



Data Model to Manage Key Characteristics and risks

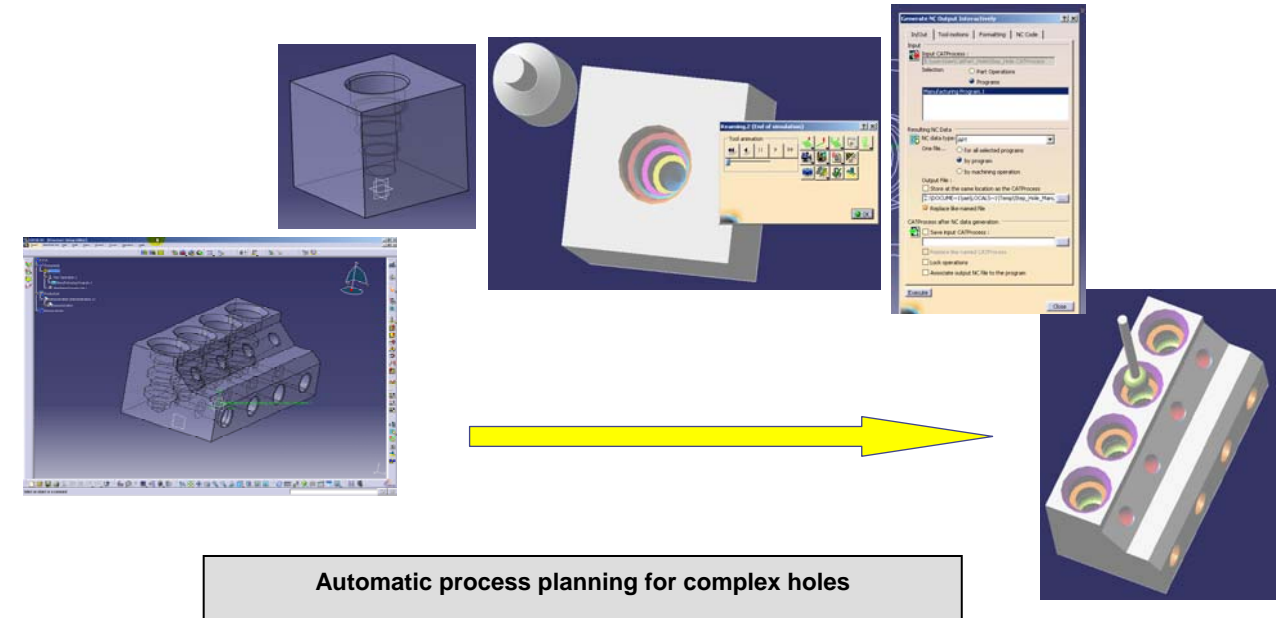
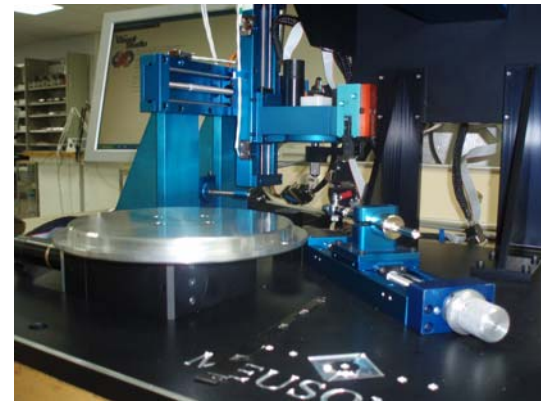


Integrated design and manufacturing of forged automobile differential



Interaction Part – Processes: manufacturability of forged parts

Robots or Special Machines Design



Automatic process planning for complex holes