ROBOFOOT

Smart robotics for high added value footwear industry

Past and present

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SEVENTH FRAMEWORK PROGRAMME

Robots in Footwear sector

Before

- Highly automated
- Labour intensive

ROBOFOOT

- Achievements for some operations
- End users awareness

After

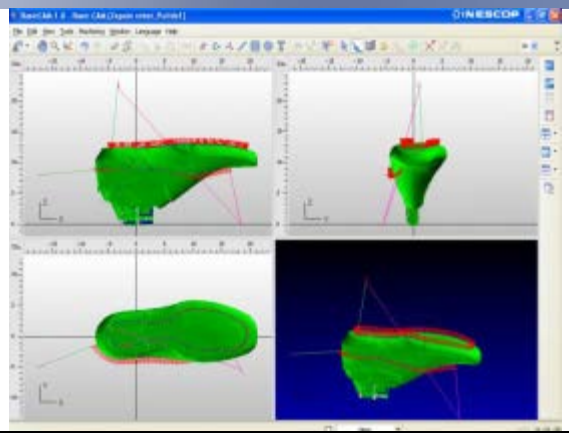
- Deployment

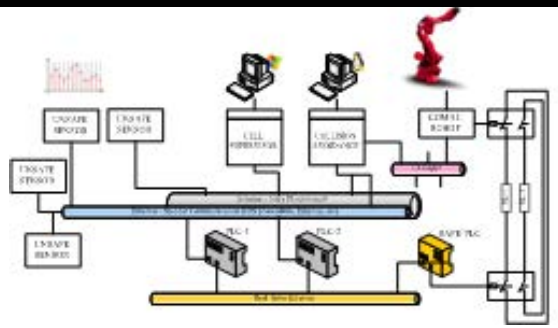
BEFORE

Desma

ROBOFOOT-Step change (1)

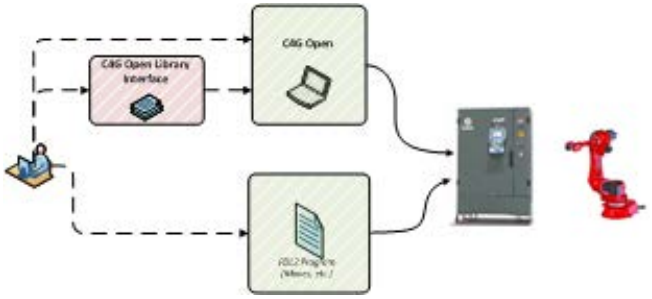
- **Configurability**
  - **Intuitive programming methods:**
    - **CAD/CAM**
    - **Programming by demonstration**
- Adaptability
- **Interaction ability**
  - **Manual Guidance Device**
  - **Safety approach**
- Dependability
- Motion capability
  - Visual servoing
  - Force based trajectory control
- **Manipulation ability**
  - **Manipulation of rigid/non-rigid parts**
- Perception ability
  - Vision: visual servoing and quality assesment
- Decisional autonomy
- Cognitive ability

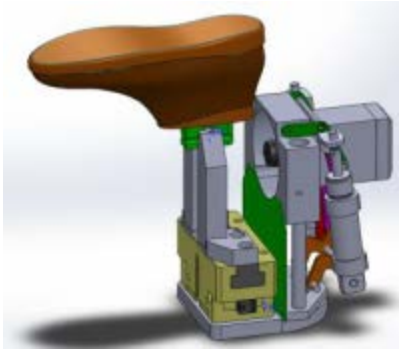




ROBOFOOT-Step change (2)

- Configurability
  - Intuitive programming methods:
    - CAD/CAM
    - Programming by demonstration
- Adaptability
- Interaction ability
  - Manual Guidance Device
  - Safety approach
- Dependability
- **Motion capability**
  - **Visual servoing**
  - **Force based trajectory control**
  - **Open Control Architecture**
- **Manipulation ability**
  - **Manipulation of rigid/non-rigid parts**
- **Perception ability**
  - **Vision: visual servoing and quality assessment**
- Decisional autonomy
- Cognitive ability





ROBOFOOT-Step change (3)

- Barriers to market
  - User awareness of robotic technologies
  - User Concerns about system complexity
  - Cost of ownership and return of investment
  - Flexibility and adaptation of systems to changing needs

		PIKOLINOS Quality Manager		VABENE Quality Manager		Skilled Worker		Majority	
		Items	%	Items	%	Items	%	Items	%
ROBOT	GOOD	8	31%	6	23%	16	62%	8	31%
	BAD	18	69%	20	77%	10	38%	18	69%
	Total	26		26		26		26	
WORKERS	GOOD	14	54%	14	54%	12	46%	14	54%
	BAD	12	46%	12	46%	14	54%	12	46%
	Total	26		26		26		26	

LESSONS LEARNED

- Technical feasibility
- Awareness created
- Ambitious objectives
- Integration in real production
  - Less ambitious (closer to more conventional approaches)
  - Incremental approach
  - Safety is still an issue

BEYOND ROBOFOOT (1)

- PIKOLINOS
  - New approach
    - Different layout (monoblock)
    - Different robot (smaller)
    - Integrated with the production management system
  - Validated and ready to install the **Inking cell**
    - In the new collection production line
    - Scheduled by Summer
  - Why:
    - Back to Europe
      - Time to market
      - Logistics (simpler and cheaper)
    - Quality
    - Working conditions
    - ROI (estimated in 3 years)
  - Next step: **Polishing cell**
    - In one year
- OTHER END USERS
  - IGMAPA: Gluing

BEYOND ROBOFOOT (2)

- Robotic Industry: COMAU
  - Open House
    - Showing technological transfer from research project to the market
    - 1.000 attendants
  - Business opportunities
    - In the shoe-making production
    - For other markets which need strong sensor integration