



# University of Patras

## Mechanical Engineering and Aeronautics Department

### Robotics Group

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- **Professor Nikos A. Aspragathos** leads the Robotics Group consisting of one Post-Doc Researcher and 9 PhD students.
- **Current research areas:**
  - Control of robots and mechatronic systems
  - Design of mechatronic systems and products using artificial intelligence
  - Motion planning and robot control based on Artificial Intelligence, using Genetic Algorithms, Neural Networks, Agent Theory and Computational Geometry
  - Modeling and investigation of the dynamic behavior of electromechanical systems
- **The robotics group has been involved in the following EC funded projects:**
  - I\*PROMS NoE (Innovative Production Machines and Systems).
  - 4M NoE (Multi – Material – Micro – Manufacturing).
  - EAPSTRA (EurAsian Network for Product Lifecycle Support & Training).
  - APoST (Advanced Product and Support Technologies).
  - HOMER (Handling of Non – Rigid Materials with Robots).
  - ROBAS (Robotic Assembly).
  - EURON (European Robotics Research Network) (non-funded)

# Design of reconfigurable robotic workcells.

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## ○ Needs

- Truly rapid reconfiguration procedure and processes.
- Incorporation of “Plug-and-Play” architecture in hardware and software components.
- Current applicable software lacks modular architecture and therefore lacks the required flexibility level.
- There is a lack of tools for the development of intelligent design and operation procedures for reconfigurable robots.

## ○ Objectives

- Development of a rapid reconfigurable robotic workcell in order to increase the flexibility and agility of the manufacturing.
- Development of a rapid reconfigurable robotic workcell in order to reduce or eliminate the required off-line time for the system build-up, reconfiguration and repair, in the most cost effective way.
- Increasing the homogeneity of reconfigurable robots, in order to achieve a cost effective and rapid reconfigurable system.
- Development of modular architecture control schemes for reconfigurable robots, utilizing “Plug-and-Play” architecture both in hardware and software components.
- Development of intelligent simulators for the rapid design, planning and control of reconfigurable robotic workcells.

# Design of reconfigurable robotic workcells. (Cont.)

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- This project idea is relevant to the FP7 ICT and more specifically the NMP 2007-3.2.1 topic as a medium-scale focused research Project
- Proposed budget: 2-2.5 M€
- Duration: 36 Months
- Number of Partners: 6-8

# Design of reconfigurable robotic workcells.(Cont.)

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- Additional expertise needed:
  - Experts on design and development of robot controllers.
  - Experts on design and implementation of simulators
  - Robot manufacturers
  - SMEs.

- Contact:

**Prof. Nikos A. Aspragathos, University of Patras,  
Mechanical Engineering and Aeronautics Department,  
Machine tools lab, 26500 Rion, Achaia, Greece.  
Tel:(+30)2610-997268,2610-997212, email:  
[asprag@mech.upatras.gr](mailto:asprag@mech.upatras.gr)**