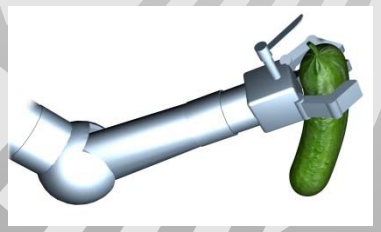
ECHORD++

The European Coordination Hub for Open Robotics Development



Cucumber Gathering – Green Field Experiments - CATCH

Fraunhofer Institute IPK-Berlin (D)

Leibniz-Institut ATB Potsdam-Bornim (D)

Center for Automation and Robotics CSIC-UPM (S)

Barbara Konz - IPK

Jelena Surdilovic – ATB

Dr. Roemi Fernandez – CSIC-UPM

Bristol Robotics Laboratory

BLUE OCEAN ROBOTICS – for humans

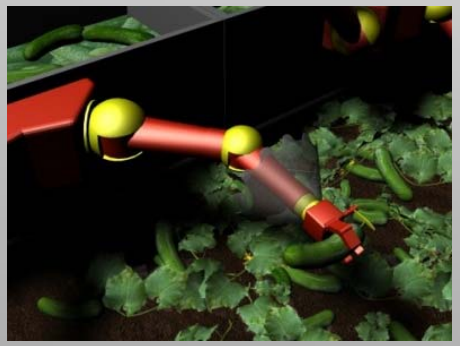
RUROBOTS Cognitive Science at Work

SEVENTH FRAMEWORK PROGRAMME

CATCH Brief Description

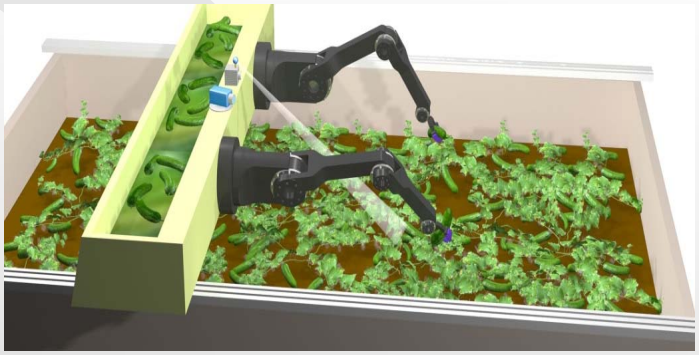
- *CATCH faces*: seasonal, manual, ergonomic unsafe, economically endangered harvesting work.
- *CATCH goals: hortibotic* outdoor solutions for automated harvesting in difficult natural conditions.
- *CATCH explores:* light-weight, modular and cheap, robust multi-arm robotic systems build of standardized components, providing economic basis and utilization models for agricultural applications.

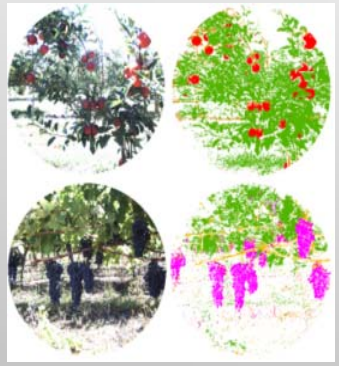
Manually harvested crops allows up to ***30 times repeatable fruitage***.

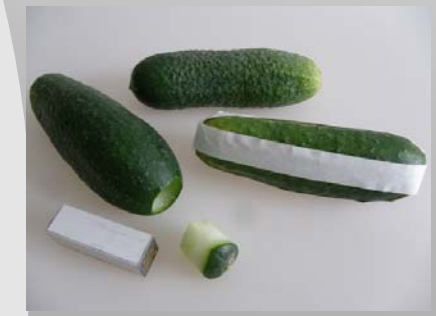


CATCH Novelty/Objectives

- *horticultural tasks analysis* - bi-manual human operations on so called “cucumber flyers”
- *robust perception* in a real harsh outdoor environment based on both visual scene and dynamic motion analysis; reliable fruit recognition and localization
- *behavior-oriented robot control* with dual-arm robotic structures for bi-manual (*human-like*) harvesting operations; e.g. sideways leaves pushing by one arm, and the vegetable picking by the second one, and vice-versa.
- *concepts and mo*dels for *affordable deployment* - robust light-weight agricultural robotic arms - reconfiguration to other crops, leasing models etc.







CATCH Impact

- **Social and environmental-** work safety and aging population; alleviate low-wage seasonal workers problem, reduce the use of herbicides, open up 24 hour/days agriculture, provide a framework for more human/friendly and sustainable production;
- **Economical -** global cost competition, crop-yield increases;
- ***Technological –*** Dual-arm hortibots for surface covering applications; dynamic vision system, intelligent vision and behaviour-based embedded control, harvesting process oriented robot programming;

- >15 cucumbers/min
- < 15000 €
- new spin-offs (technology & appl.)
- new-business models (leasing, adaptations)