



strengthening industry–academia cooperation: challenges and opportunities for European service robotics

Bruno Siciliano
Università di Napoli Federico II

INTERNATIONAL COLLOQUIUM DEDICATED TO THE 85TH BIRTHDAY OF
ANTAL K. BEJCZY – ROBOTICS IN THE 21ST CENTURY: NEW FRONTIERS

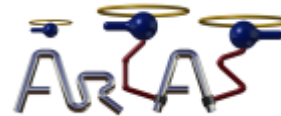
February 17th, 2015
Óbuda University, Budapest



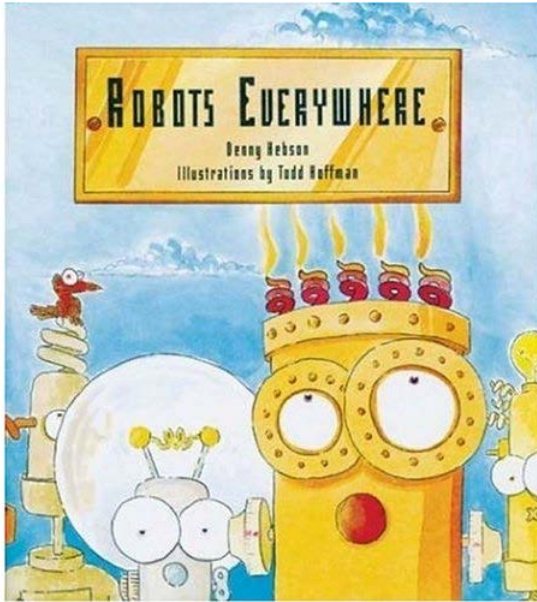
Bruno Siciliano • Luigi Villani • Vincenzo Lippiello
 Alberto Finzi • Silvia Rossi • Franco Cutugno
 Fanny Ficuciello • Fabio Ruggiero • Agostino De Santis
 Rafik Mebarki • Antoine Petit • Jun Nishiyama
 Alejandro Donaire • Francesca Cordella
 Mariacarla Staffa • Daniela D'Auria • Luca Buonocore
 Jonathan Cacace • Diana Serra • Mahdi Momeni
 Valeria Federico • Jonathan van der Meer

FUNDING

8.3 M€



robots!!!



today

Mars
oceans
hospitals
factories
schools
homes

...

intelligent
personal
pervasive
disappearing
ubiquitous

tomorrow



from factories to our homes

industry



automobile
chemical
electronic
food

field



aeronautics
aerospace
subsea
rescue

service



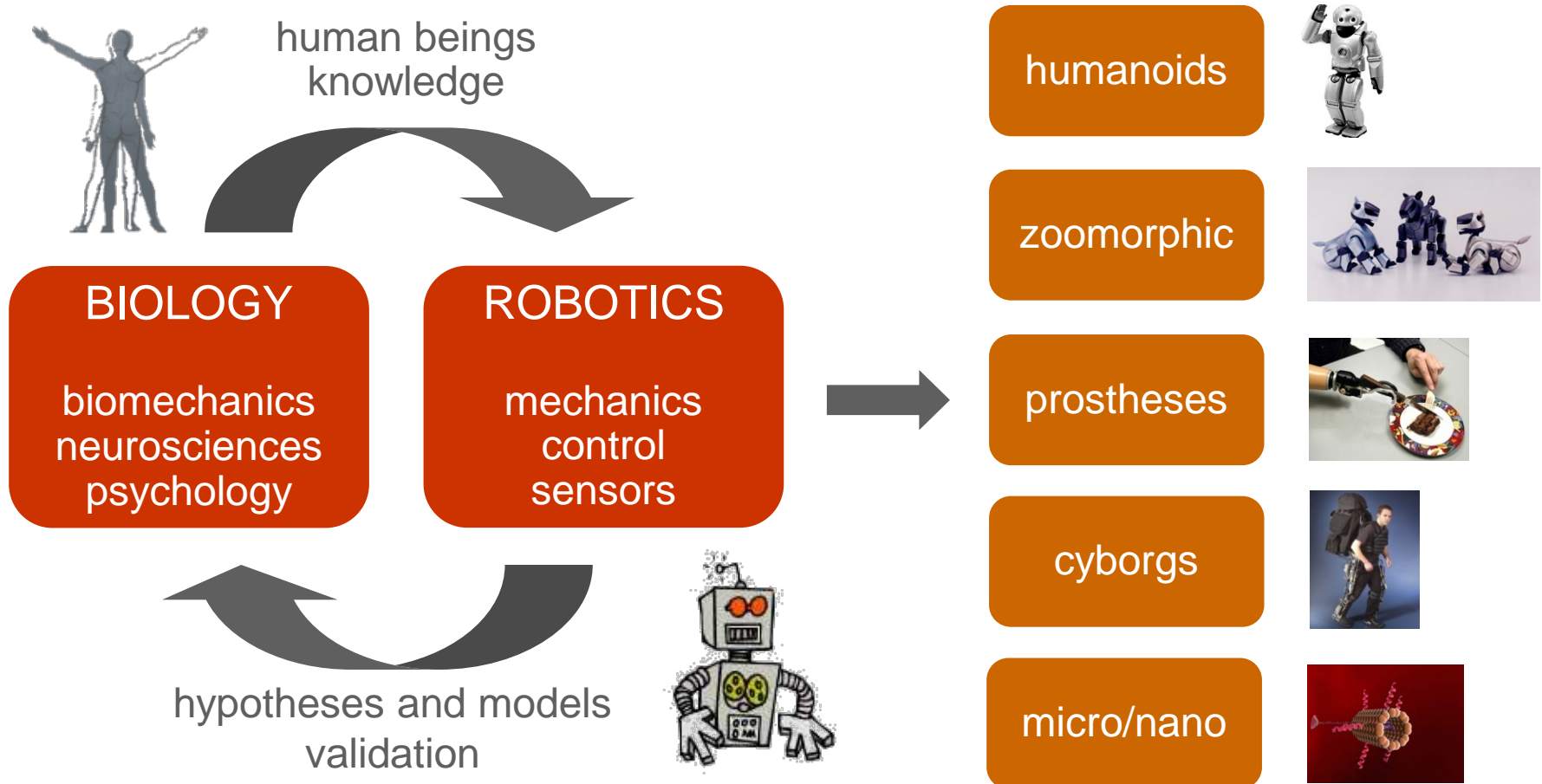
domestic
edutainment
rehabilitation
medicine

level of autonomy

biological inspiration

«la scienza m'interessa proprio nel mio sforzo per uscire da una conoscenza antropomorfa; ma nello stesso tempo sono convinto che la nostra immaginazione non può essere che antropomorfa»

Italo Calvino

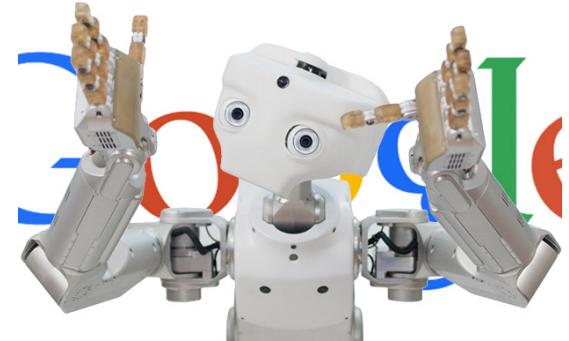
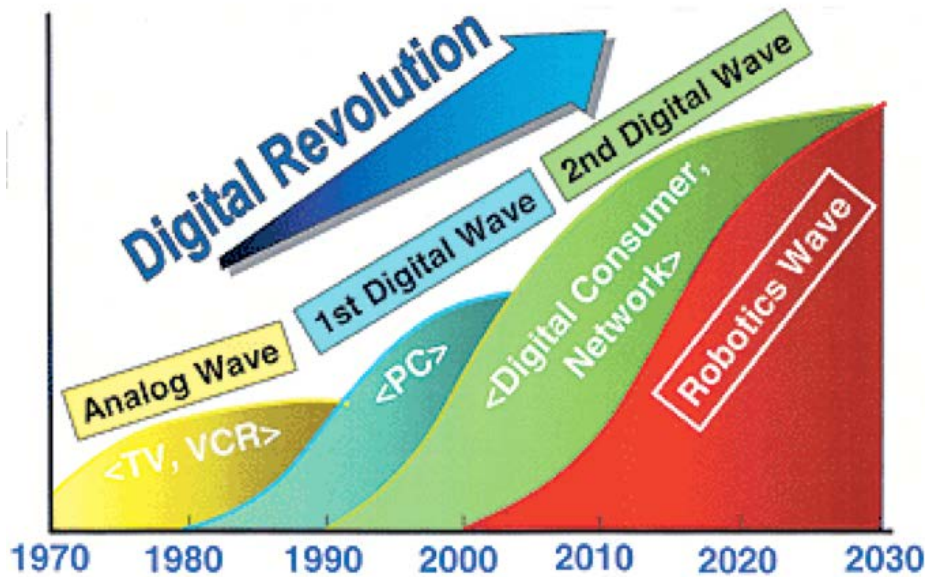


new emerging areas

- by dawn of new millennium, robotics has undergone a major transformation in scope and dimensions
 - maturity of field and advances in its related technologies
- expansion into challenges of human world (**human-centered and life-like robotics**)
 - new generation of robots expected to safely and dependably co-habitat with humans in homes, workplaces, and communities, providing support in services, entertainment, education, healthcare, manufacturing, and assistance

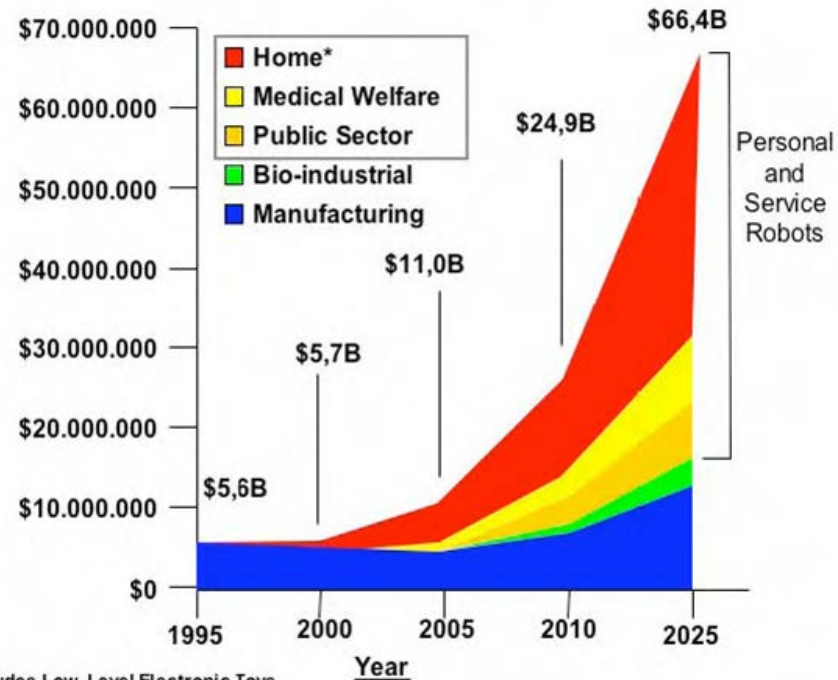


market trends



a recent study by McKinsey estimates that the value of the application of advanced robotics in healthcare, manufacturing and services could have an annual economic impact of between \$1.7 trillion and \$4.5 trillion worldwide by 2025

Market Size (\$1.000)



* Excludes Low Level Electronic Toys

Source : Japan Robotics Association

the European agenda

- 32% of current world markets
 - industrial robotics: market share of 33%
 - smaller professional service robots: 63% of non-military robots
 - domestic and service robots: market share of 14%
- at completion of EU funded FP7
 - 130 **robotics** based R&D&I projects involving around 500 organisations with total grants of some **€536 million**
 - other funding with elements related to **robotics** amounts to some **€170 million**
 - **Italy received 11% funding vs 7% share in FP7 research budget 😊**

robots in the media

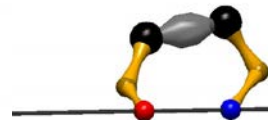
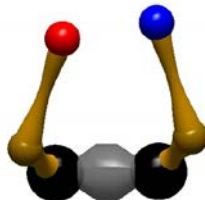
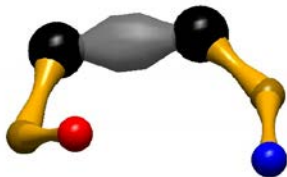
- image of European research does not represent the quality and quantity of work done
- **European robotics is underrepresented in the media** — seen most often
 - humanoid robots from Asia
 - service robots from America
 - robots in films (from America)
 - e.g., Wikipedia: <5% of depicted robots are European

dissemination

- establish a brand
 - bring together stakeholders & communicate a common vision/standpoint
 - accessibility through central contact point
- make material accessible for media to publish
- actively promote European robotics by **increasing visibility**
 - in the media
 - at events
 - in schools

dispelling a commonplace

- Robotic Dynamic Manipulation
 - 2.5 M€ for five years started June 2013
 - only “robotics” proposal among the 302 selected in Physical Sciences and Engineering in the 2012 call out of a total of 2304 proposals
 - tested on **advanced demonstrator**, i.e. **pizza making process**, conceived to emulate the human ability to carry out challenging robotic tasks

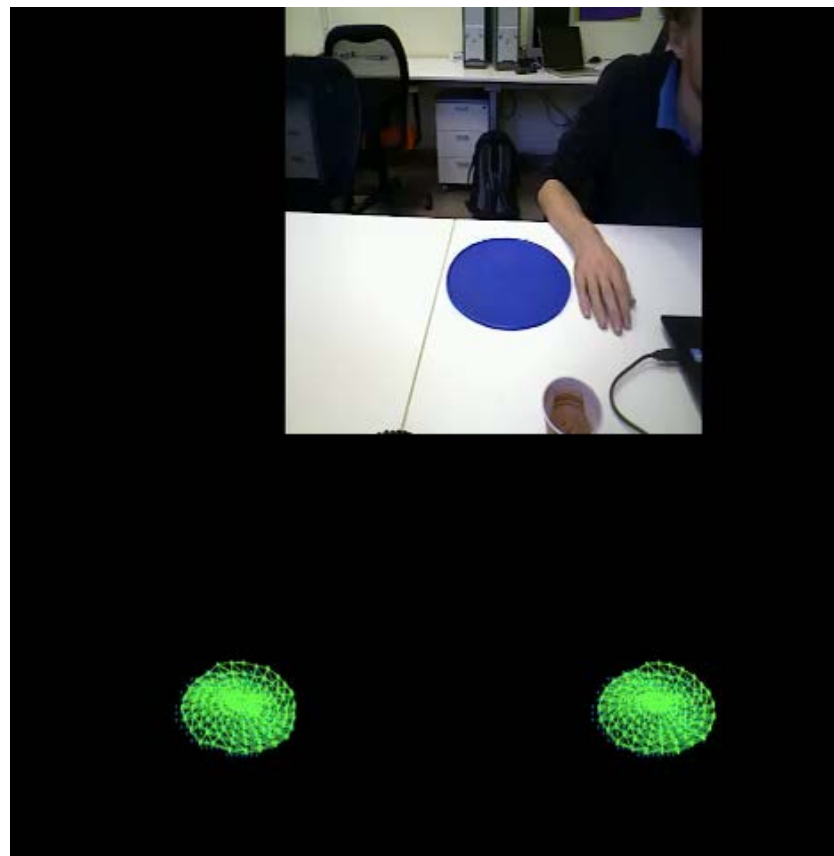
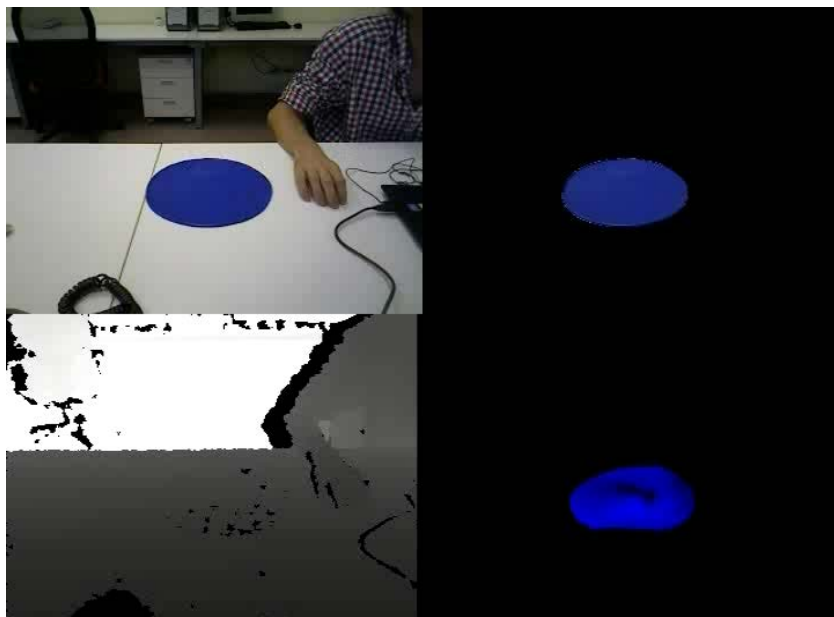




Manipolazione non prensile di un disco su di un piano attuato da un robot manipolatore

PRISMA Lab

www.prisma.unina.it



enhancing the dialogue

- robots are still **information islands**, without any standardization of data communication, programming languages, or even terminology
- initiatives are growing to share **advanced training**
 - industrial internships for PhDs and professors
 - scientific internship for industry people
- science journalists do not know about European robotics
 - maintain a press centre and web portal for European robotics
- robot **challenges** and **competitions** have proven to work
- the universities' evaluation procedures lead to too many, too fragmented, too expensive, and too inaccessible publications
 - citations are easier to count than industrial usefulness

the eight SRA commandments

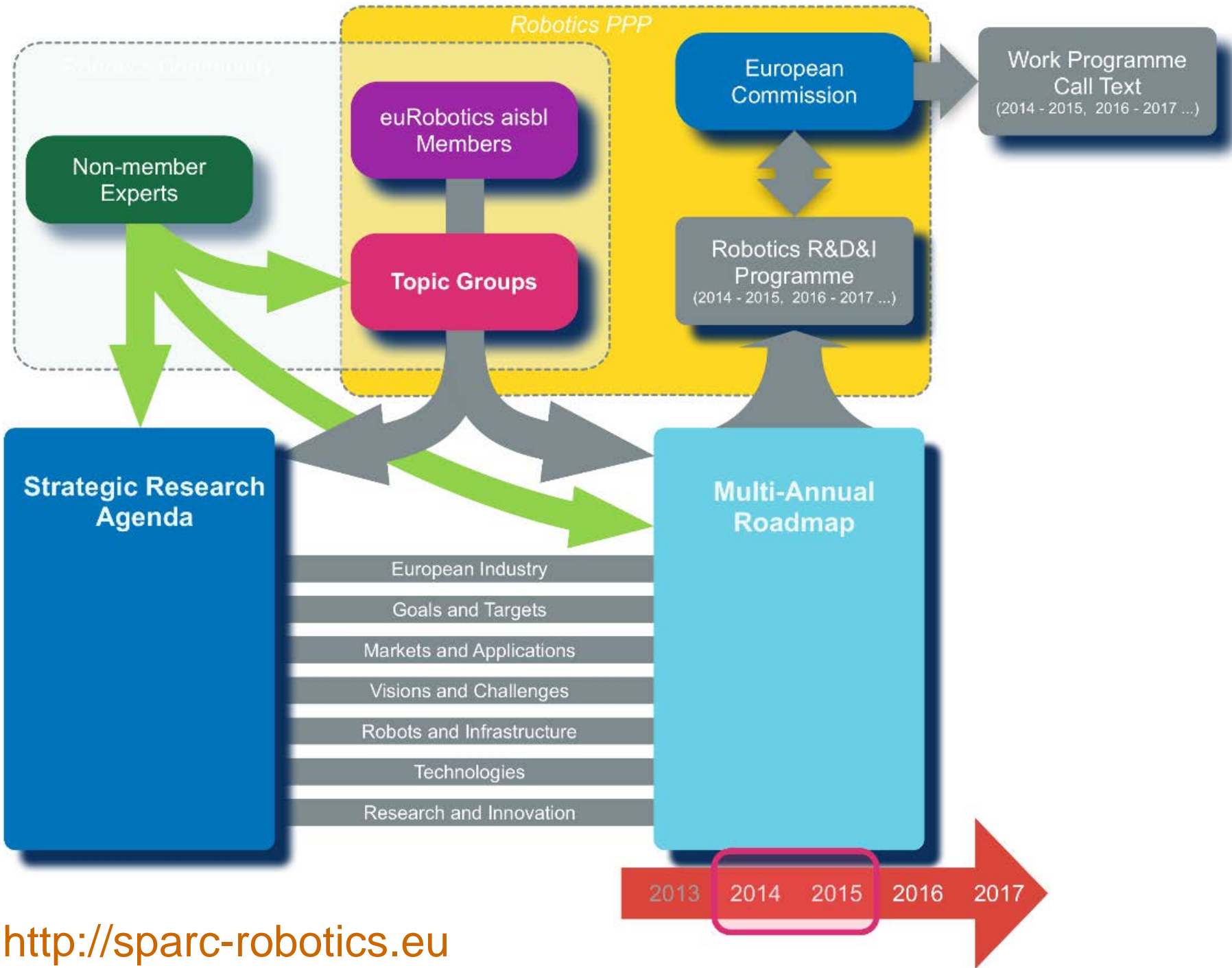
- take advantage of robotics technology in all aspects of life
- master the challenge of system integration
- create a European robotics supply chain
- focus on the right research and technologies
- create new markets through SME support and technology transfer
- support cross-fertilisation to maximise the impact of R&D
- enhance robotics training and education
- avoid ethical, legal, and societal issues becoming barriers

a European challenge

- benefits of tighter **academia (A)–industry (I) cooperation**
 - exploiting the full potential of excellent European robotics research
 - achieving **faster technology transfers**
 - increasing European competitiveness
 - expanding industrial activities
 - reaching a world-wide leadership position
- **gaps between A & I**
 - it is important to recognise that there has always been excellent R&D performed at both A and I, and that **cooperation has taken place between privileged A and I**
 - discrepancy between state of the art in robotics research vs. actual utilized technology — if direct contact between researchers (who usually write papers) and industrial engineers (who normally do not read papers) is to be promoted, then **results have to be put in a truly industrial perspective**

bridging the gaps in H2020





grazie ... köszönöm [:]

