



TECNICO

POL

DI TORINO

Politecnico

Interdepartmental

Center

4

Service

Robotics

Going beyond the «line of sight»...





Interdepartmental centers





	POLITECNICO DI TORINO			
SCOPRIRE	DIDATTICA	IL MONDO DELLA	INNOVAZIONE PER	AMMINISTRAZIONE
L'ATENEO	E STUDENTI	RICERCA	LE IMPRESE	E SERVIZI

Home > II mondo della ricerca > I Centri interdipartimentali

I Dipartimenti	
▶ I Centri nterdipartimentali	Una delle sfide più attuali con cui si confrontano i ricercatori è rappresentata dalla complessità dei problemi scientifici da affrontare. Sempre più spesso, la risposta a questo
Le Scuole	genere di problematiche necessita del contributo organizzato di più discipline.
Dottorato di Ricerca	L'Ateneo ha fatto propria nel Piano Strategico la sfida di rendere sistematica la
Le biblioteche	collaborazione interdisciplinare fra i diversi ambiti tecnologici e scientifici.
 Finanziamenti per la Ricerca 	Rifacendosi alle più interessanti esperienze internazionali (MIT, Technion, ETH e EPFL), questo obiettivo strategico è stato tradotto in azione attraverso l'istituzione e il finanziamento
Archivio pubblicazioni	dei Centri Interdipartimentali.
PORTO	Si tratta di piattaforme fisiche e organizzative temporanee (3/5 anni) in cui ricercatori
Enti e consorzi	
 Opportunità per i Ricercatori 	 aggregare competenze e produrre conoscenza nell'ambito delle cosiddette breakthrough technologies;
AQ Ricerca	 accrescere la reputazione e la visibilità dell'Ateneo nelle aree di interesse strategico per il Territorio e per il Paese;
	potenziare le collaborazioni con le istituzioni internazionali più prestigiose;
	consolidare i rapporti di partnership con i principali attori del sistema socio-economico.



- IAM Integrated Addtive Manufacturing@PoliTo
- FULL The Future Urban Legacy Lab
- Ec-L Energy Center Lab
- CARS Center for Automotive Research and Sustainable mobility@PoliTO

POLITECNICO

SmartData - Big Data and Data Science Laboratory

Centri Interdipartimentali Bottom Up

- ▶ CWC CleanWaterCer UTIO TO TO
- PolitoBIOMed Lab Biomedical Engineering Lab
- PIC4Ser PoliTO Interdepartmental Centre for Service Robotics
- J-Tech Advanced Joining Technology
- PEIC Power Electronics Innovation Center
- PhotoNext







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Service robotics





Service robotics

From Wikipedia, the free encyclopedia

Service robots assist human beings, typically by performing a job that is <u>dirty, dull, distant, dangerous</u> <u>or repetitive, including household chores.</u>

They typically are **autonomous** and/or operated by a **built-in control system**, with manual override options. The term "service robot" does not have a strict technical definition.

The International Federation of Robotics (IFR) has proposed a tentative definition:

"A service robot is a robot which operates semi or fully autonomously <u>to perform services useful to</u> <u>the well-being of humans and equipment, excluding manufacturing operations</u>."















PIC4SeR in «pills»



PIC4SeR in «pills»

Keypoints

- **5 departments** (DET, DAUIN, DIMEAS, DIATI, DAD)
- 45 people initially involved
- 7 PoliTO labs partially available to start the activities
- External industrial facilities available
- HR investments: PhD, technicians, researchers (RTDA), grant holders and research fellows
- Plan of investments: instruments, sensors and vehicles for technology demonstration + prototypes with companies
- 4 key application areas:
 - Precision agriculture
 - Smart Cities & Search&Rescue
 - Service robotics for wellbeing
 - Cultural heritage





PIC4SeR in «pills»

Enabling Technologies





/Energy optimization		/Satellite navigation	1			
/Cooperative positioning		ositioning	/4G and 5G Netwo	orks		
/Path planning			/SDR receivers			
/Locomotion			/Sensor integration			
/ROS	/ <mark>Soft</mark> rot	ootics	/Multimedia		inication	
/Con	trol /Coding	/Human Ma	achine Interactio	on	/Internet of Things	
/Machine learning			/Ethics	/Interact	/Interaction visualitazion	
/Data fusion /Artificial Intelligence /Edge-Fog-Cloud Computing /Embedded Computing			/Interaction design			
			/System Co-Desig	'n		
			/Co-li	ving <mark>Design</mark>		









Why PIC4SeR?



Why PIC4SeR?



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- Many of the current research, innovation and development in the service robotic field, can be classified as disruptive technologies
- Several uncorrelated research projects and industrial partnerships (already available inside PoliTO) must be harmonized and coordinated to optimize the results
- To start a **common workplace**, a common knowledge and a common language
- To develop an **integrated approach** and technology development process in this booming area
- To help PoliTO reaching a **critical mass** in this sector (instead of several scattered initiatives)
- To link together technology needs coming from several industrial partners
- To start **interdisciplinary didactic activities** in this area
- To join several international research communities with a unique "face" and coordinated research proposals



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POLITECNICO DI TORINO PIC4SeR



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POLITECNICO DI TORINO



Centre Management



Centre Management



POLITECNICO DI TORINO



- Project manager (PM): Marcello Chiaberge (DET)
- Management board (MB): PM + Fabio Dovis (DET), Andrea Lingua (DIATI), Giuseppe Quaglia (DIMEAS), Fabrizio Valpreda (DAD), Enrico Masala (DAUIN)
- Advisory board (AB): PM + representatives of the leading scientific partners, local authorities and involved industrial/scientific partners
- Technical committee (TC): all staff of the Centre (4 times / year)
- General assembly (1 time / year)









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The operating scenario

















www.polito.it/ricerca/centri/pic4ser/

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