

# Foreword

This report originates from the need to gain comprehensive knowledge about the competences developed by researchers at the University of Torino in scientific domains that are crucial to address the challenges raised by the transition of the society towards the so-called Industry 4.0.

A working group has been created as of November 2016, involving several researchers affiliated to a wide array of Departments. The main aim of this working group was to provide a synthetic description of the scientific activities carried out by research teams, which show a high complementarity degree with the principles inspiring the Industry 4.0 paradigm or having high potential in supporting its successful implementation, by maximizing the returns and minimizing the social and economic costs.

The Departments involved in this enterprise were the following:

*Department of Agricultural, Forest and Food Sciences*

*Department of Chemistry*

*Department of Clinical and Biological Sciences*

*Department of Computer Science*

*Department of Cultures, Politics and Society*

*Department of Economics and Statistics “Cognetti de Martiis”*

*Department of Law*

*Department of Life Sciences and Systems Biology*

*Department of Management*

*Department of Mathematics “Giuseppe Peano”*

*Department of Medical Sciences*

*Department of Physics*

*Department of Psychology*

In addition, three Interdepartmental Research Centers took part to the activities of the working group:

*Centre on ICTs and Innovation for the Society and Territory (ICxT)*

*Centre on Nanostructured Interfaces and Surfaces (NIS)*

*Competence Centre on Scientific Calculus (C3S)*

The report intends to provide systematic evidence of the strengths of researchers at the University of Torino in the wake of the fourth industrial revolution, as well as of the opportunities for large companies, small firms and other stakeholders to establish fruitful collaborations to cope with the multifaceted nature of the transformation imposed by the new paradigm. This report has been produced by a team that collected and processed the knowledge provided by the participants at the working group.

The team is composed by:

Silvio Aime (*Vice-rector, coordinator*)

Marco Pironti (*Department of Computer Science*)

Francesco Quatraro (*Department of Economics and Statistics Cagnetti de Martiis*)

Marco Zanetti (*Department of Chemistry*)

Silvia Forno and Francesca Natale (*Industrial Partnership Liason Team, Research & Third Mission Division*)

Stefania Stecca (*Communication, General Directorate*)

Contributions to the paper came from an extended group composed by:

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*Department of Mathematics “Giuseppe Peano” - Laura Lea Sacerdote.*

*Department of Agricultural, Forest and Food Sciences - Remigio Berruto, Paolo Gay, Vincenzo Gerbi, Maria Ludovica Gullino, Giuseppe Zeppa.*

*Department of Management - Riccardo Beltramo, Pierantonio Bertero, Valter Cantino (Department of Management Director), Paola De Bernardi, Alberto Ferraris, Giuseppe Tardivo, Roberto Schiesari.*

*Department of Cultures, Politics and Society - Filippo Barbera, Roberto Di Monaco, Dario Padovan, Sergio Bernardino Scamuzzi, (Vice-Rector), Lia Tirabeni.*

*Department of Economics and Statistics “Cognetti de Martiis” - Marco Guerzoni, Massimiliano Nuccio, Francesco Quatraro.*

*Department of Psychology - Chiara Ghislieri.*

*Department of Law - Francesco Costamagna, Alberto Oddenino, Ugo Pagallo.*

*Department of Earth Sciences - Cesare Comina, Giuseppe Mandrone, Alessandro Pavese, Giulio Pavia.*

*Department of Molecular Biotechnology and Health Sciences - Silvio Aime (Vice-Rector).*

*Department of Life Sciences and Systems Biology - Margherita Micheletti Cremasco.*

*UniTo Incubator 2i3T - Giuseppe Serrao.*

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# Preface

The challenges brought by I4.0 call for a renewed role of the University as it implies to further strengthen its deep integration over its territory to support the continuous improvement of its manufacturing system.

Tasks in educational and training programs and in the selection of research projects have to be refocussed towards the main needs of the ongoing industrial transformation.

The University will be more and more integrated in the engine of the development of its territory.

The University of Torino is keen to play this role and contribute to maintain for Turin and Piedmont their primary position in the field of manufacturing industry.

To tackle this task, a Working Group (WG) formed by delegates from several Departments has been set up with the commitment to start to make an inventory of what UniTo may contribute along the challenging avenues of I4.0. The contributions have been summarized in this document that aims at being the starting point for the development of new interdisciplinary collaborations between UniTo and the industrial system in the frame of the new horizons opened by I4.0.

*Silvio Aime*