



Rossini

ROSSINI

RObot enhanced SenSing, INtelligence and actuation to Improve productivity and job quality in manufacturing

Deliverable

D9.I Project Website

Deliverable Lead: CORE INNOVATION

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DISCLAIMER

The sole responsibility for the content of this publication lies with the ROSSINI project and in no way reflects the views of the European Union.



EXECUTIVE SUMMARY / ABSTRACT

A website was created for the ROSSINI project as Deliverable 9.1 as part of Work Package 9, ‘Impact Enhancement’ and is hosted at www.rossini-project.com. The website’s design, development and maintenance are carried out by CORE INNOVATION (CORE). The website was designed and developed by an internal designer at CORE, and content was created, edited and developed internally by CORE. CORE will continue to maintain and update the website in cooperation with the other project partners throughout the course of the project. The website represents the project’s primary method of communication within the Consortium and with external stakeholders and the wider public.

SCOPE

ROSSINI deliverable D9.1 describes the website created for external and internal communication about and on the project. This deliverable relates to Work Package (WP) 9 “Impact Enhancement”, task (T9.1 “Project Website”) which includes the objective: “develop and structure all activities aimed at ensuring the widest possible scientific and industrial impact for the ROSSINI project.”.

The Privacy Policy of the website, as well as additional information regarding data processing and policy have been annexed to the present Deliverable, to ensure the compliance with the Ethics requirements foreseen by the project.



I The Project Website Structure

The website is accessible at: www.rossini-project.com.

All sections of the website have on Left top the ROSSINI logo and in footer reference to the HORIZON 2020 funding by the European Union, the Coordinator, the Communication Manager, and the Partners. Links to the main pages “Rossini” (Home), “Concept”, “Methodology”, “Platform”, “Partners” area is included on the header, i.e. a navigation pane accessible from all sub-pages.

I.1 Website Navigation Tree Map

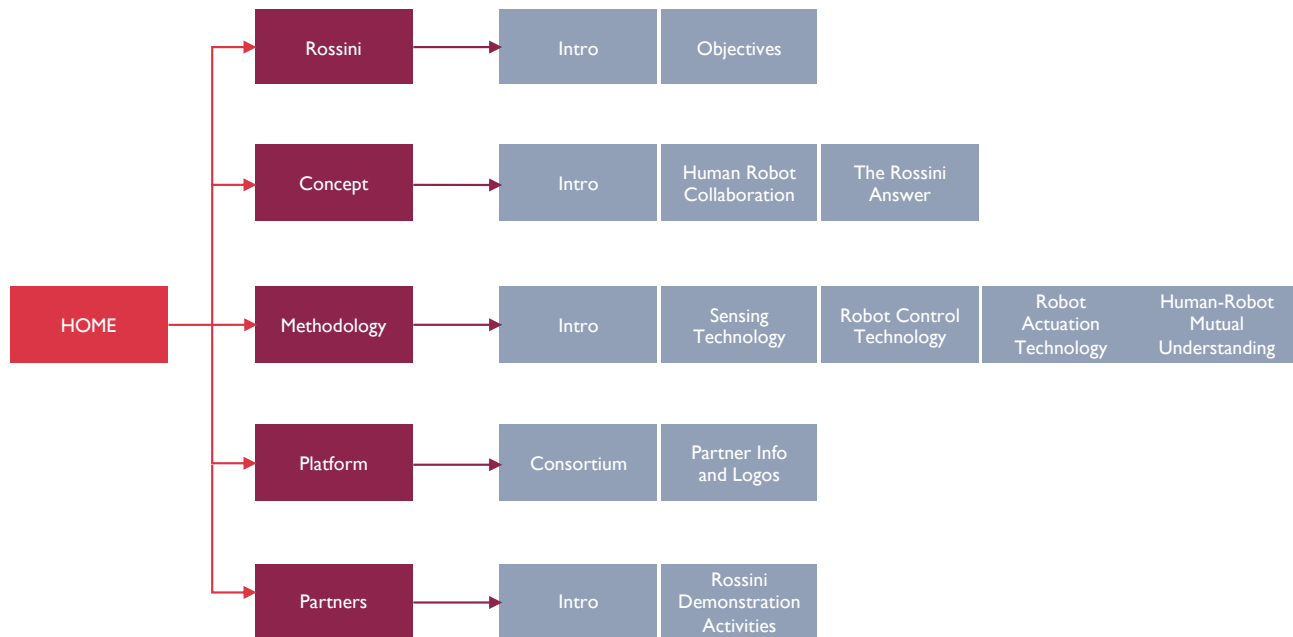


Figure 1-1: Website tree map

I.2 Essential Technical Features

The technical features adopted in the website and Reserved Area are:

- Fully responsive: all website contents and pages have a mobile-ready version
- Cross platform desktop browsers compatibility: website supports five major desktop browsers (Chrome, Internet edge, Firefox, Safari, and Opera) each with several active versions.

I.3 Aesthetic elements

The website follows a semi-continuous flow design, with “learn More” buttons to navigate to the next pages, without requiring to select from the navigation pane. The background colour was selected to be black, in order to be more environmental friendly, and to allow a nice contrast with the orange colour in the logo. All photos are royalty free, respecting their usage rights, and their choice was based on the depicting of the accompanying text to maximise the cognitive workload.

Animated images/visuals have been added in all the pages. These are mainly inspired by our Logo, which represents a continuous rotation of a robotic link. To this end, different structures have been created and animated to represent the text. The goal is to increase the awareness of ROSSINI and its logo as a “stamp” and by applying animated visuals with it, it is envisaged to “stick” to the visitors, remembering and identifying ROSSINI by its logo. The branding of the logo selection will be available in detail in the D9.2 PEDR.



2 Main Pages and Essential Interactive Elements

2.1 Main Menu – Navigation Pane on Header

ROSSINI project web contents are divided into 4 main sections as shown in Figure 2-1.

1. Rossini: It provides the main goal of the project, its vision, and its objectives.
2. Concept: This page contains the main concept of the project, an overview of state-of-the-art technologies in Europe and ROSSINI's approach
3. Methodology: This section describes the main technologies of ROSSINI
4. Platform: This section describes the ROSSINI Platform architecture and the ROSSINI Demonstration activities through 3 use cases
5. Partners: Introduction of the consortium partners, with a short description, their logo, and link to their websites.



Figure 2-1: Main Menu - Navigation Pane on Header

2.2 Footer Section

The footer Section, as described above, contains the reference to the HORIZON 2020 funding by the European Union, with the official EU logo and the Project's Grant Agreement number. The Privacy Policy of the website will be made available upon the completion and approvals from all Partners, as well as the Project Coordinator and Communication-Dissemination Manager with respective contact details. We have decided to include the Partners in the footer, so that they will be available in all pages, apart from their detailed description in the "Partner" page.

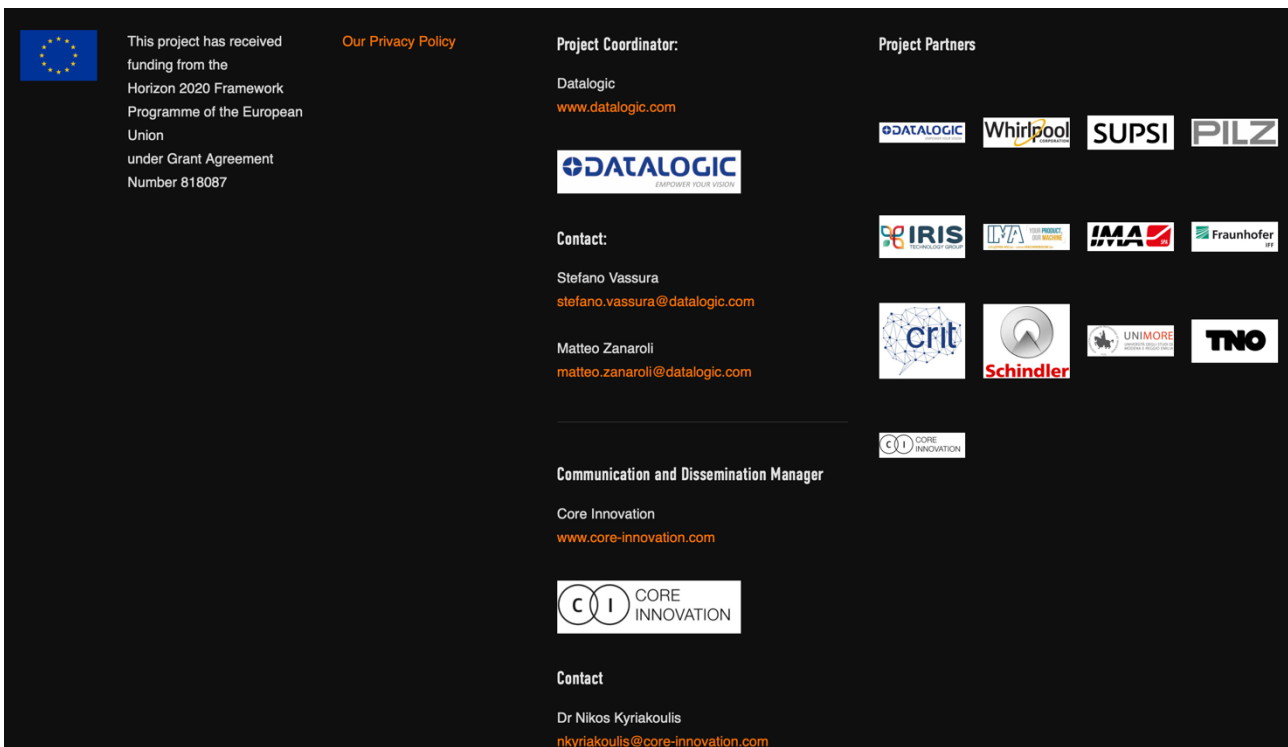


Figure 2-2: The footer of ROSSINI website

2.3 Home page

The homepage introduces the project to an external audience and includes links to every major section of the website. It presents the ROSSINI project at a glance and explains the main goal of the project. The Objectives section highlight the five (5) pillars of ROSSINI project and what is expected to be delivered. The story follows a narrative of describing what ROSSINI is about, why it is necessary, i.e how the manufacturing world would benefit from ROSSINI.

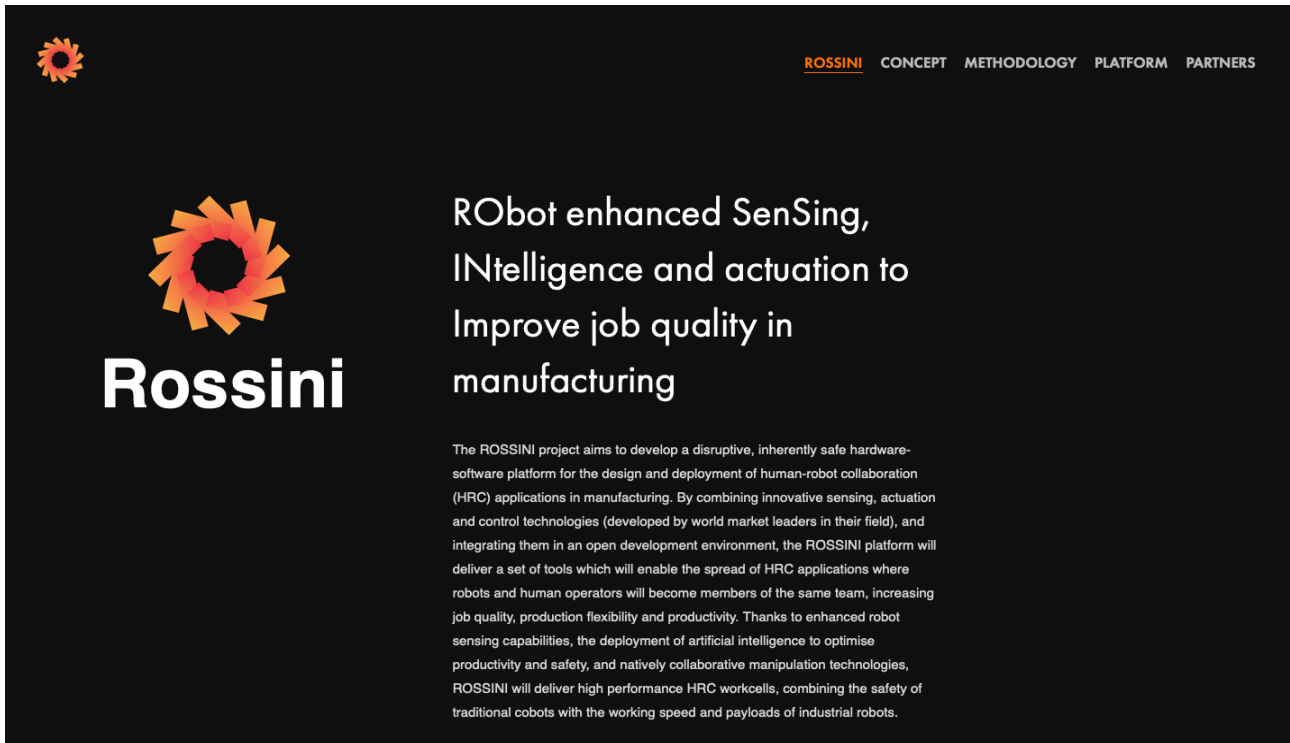


Figure 2-3: Welcome page: www.rossini-project.com

The “Rossini” sub-page clarifies to an external audience the ROSSINI Vision and Ambition, and the objectives pursued for the ROSSINI implementation. The focus is on the advancements that robots will have with ROSSINI projects, and the benefits from its employment to the shopfloors. The sub-page is divided into 2 parts:

1. Vision and Aim
2. Objectives

This page is structured as one-page view in order to ensure effectiveness and consistency to such predominantly technical level contents. This prevents users from missing content, wasting clicks and also facilitates mobile and tablet compatibility read mode. The Objectives being structured in a serial arrangement, allow users to gain this high-level information easily.

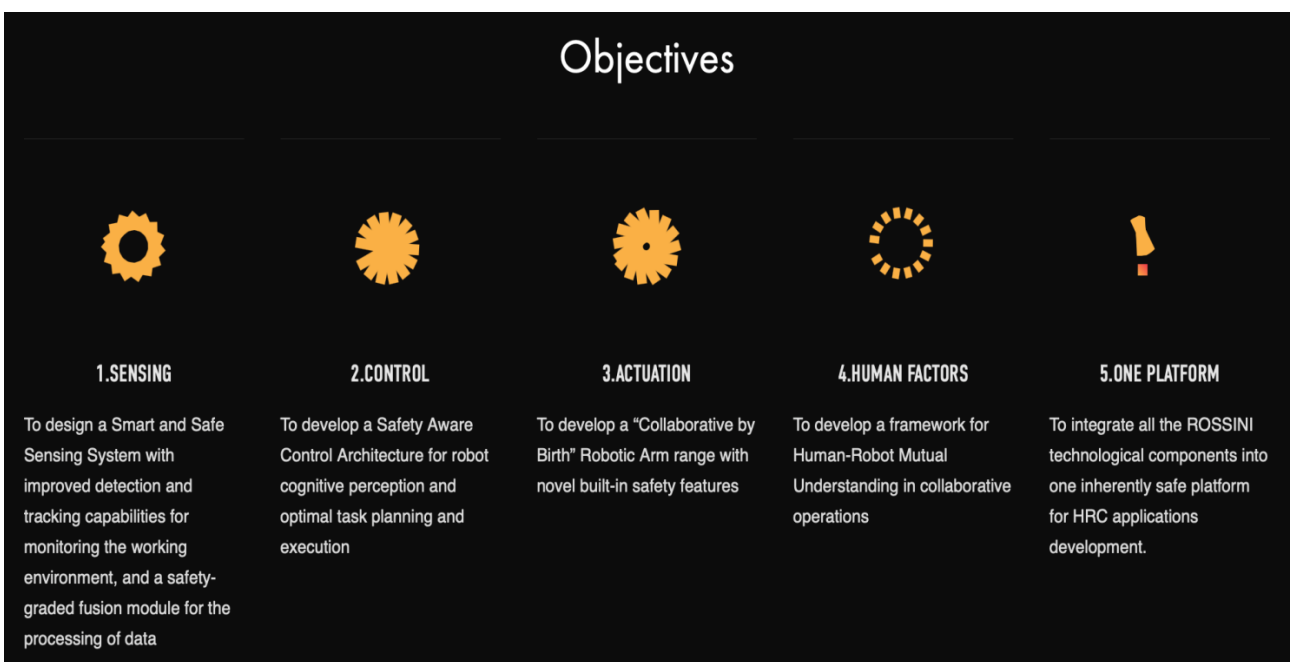


Figure 2-4: The Objectives of the ROSSINI in the “HOME” page (i.e. “ROSSINI”)



2.4 Concept

This section describes the overall concept of the ROSSINI project. Although European industry now benefits from the advantages of a single large market, it is faced with new challenges in order to remain competitive in a global scenario. In this contest Advanced Robotics, and in particular Human-Robot Collaboration (HRC) applications, could have a high potential economic impact. Furthermore, it provides information on current methods and constrains to achieve Human-Robot Collaboration, and ROSSINI’s approach in the field.



Figure 2-5: Introductory text in CONCEPT sub-page: <http://www.rossini-project.com/concept>

2.4.1 Concept body – HRC safeguarding methods

The main body in this page provides an overview of the state of art of Safety in Human robot collaboration. According to the world's first specifications of safety requirements for collaborative robot applications (ISO/TS 15066:2016), collaborative operations between humans and robots may include one or more of the safeguarding methods, which are depicted in this sub-page.

Recently introduced sensors and robot technologies enable different degrees of HRC on the factory floor, ranging from fenceless coexistence to close collaboration. According to the world's first specifications of safety requirements for collaborative robot applications (ISO/TS 15066:2016), collaborative operations between humans and robots may include one or more of the safeguarding methods depicted here

Representation of HRC safeguarding methods as per ISO/TS 15066:2016 (PILZ GMBH & CO. KG)

| | | | |
|--|---|--|--|
| | | | |
| <p>Safety-related stop (STO)</p> <p>The robot motion ceases before an operator enters the collaborative workspace to interact with the robot system and complete a task (e.g. loading a part onto the end-effector). Robot system motion can resume without any additional intervention only after the operator has exited the collaborative workspace.</p> | <p>Hand Guiding</p> <p>The operator uses a hand-operated device to transmit motion commands to the robot system. Before the operator is permitted to enter the collaborative workspace and conduct the hand-guiding task, the robot achieves a safety-rated monitored stop. The task is carried out by manually actuating guiding devices located at or near the robot end-effector.</p> | <p>Speed and distance monitoring</p> <p>The robot system and operator may move concurrently in the collaborative workspace. Risk reduction is achieved by maintaining at least the protective separation distance between operator and robot at all times during robot motion. When the robot system reduces its speed, the protective separation distance decreases correspondingly.</p> | <p>Power and force limiting</p> <p>A physical contact between the robot system (including the workpiece) and an operator can occur either intentionally or unintentionally. Power and force limited collaborative operation requires robot systems specifically designed for this particular type of operation. Risk reduction is achieved, either through inherently safe means in the robot or through a safety-related control system.</p> |

Figure 2-6: HRC safeguarding methods as per ISO/TS 15066:2016 (PILZ GMBH & CO. KG)




2.4.2 Human Robot Collaboration

This sub-page involves a summary of the basic principles in the current Human-Robot Collaboration approaches that will be taken into account during ROSSINI design and development.


Human-Robot Collaboration

In modern factories, human and robots can share workspace in different ways, and in the robotic community the terms coexistence, cooperation and collaboration are widely-used in the robotic community to refer to a case in which a human and a robot are working together in a fenceless environment, giving rise to misunderstandings and unclear wording. Behrens, Saenz, Vogel, & Elkmann, (2015) propose a taxonomy based on three essential characteristics of collaborative workcells that may build on each other to determine different forms of co-work:




Shared Workspace

The human co-worker is intended to carry out a certain task in at least a limited part of the robot workspace.




Simultaneous Co-Work

The human co-worker is intended to carry out a certain task within the shared workspace while the robot is moving to complete its task



Physical Contact

The human co-worker is intended to work hand in hand with the moving robot.



Collaboration

It is the closest form of cooperation and refers to joint actions to complete a common task at the same time, with physical contact needed and therefore included.

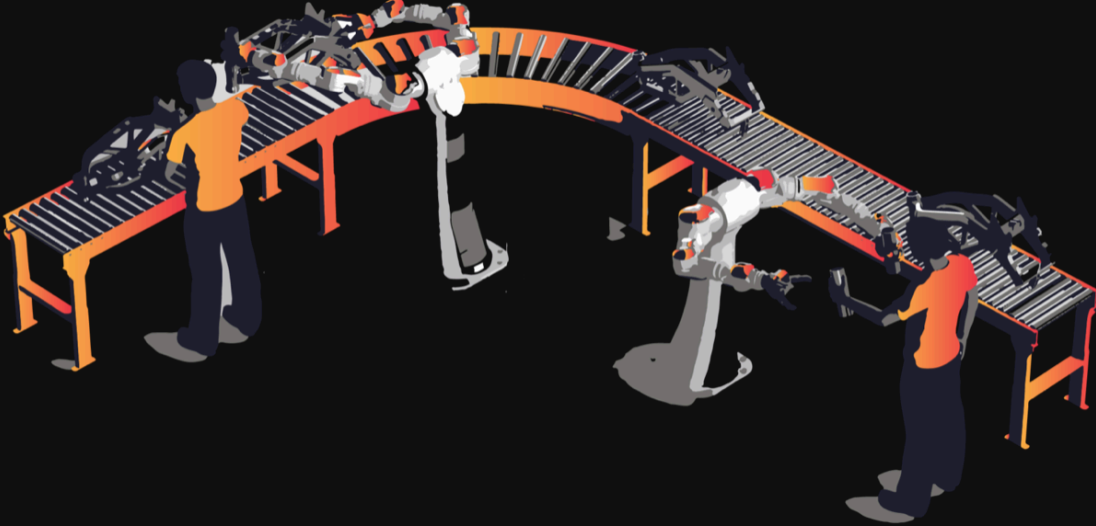


Figure 2-7: Principles on Human-Robot collaboration.

2.4.3 The Rossini answer

This pages involves the tools and guidelines that ROSSINI will use in order to speed up and increase the efficiency of risk assessment and validation procedures for HRC, particularly when measuring collision.



The Rossini answer

The involvement of the Robotic Systems Unit at the Fraunhofer Institute for Factory Operation and Automation IFF allowed to include, in the ROSSINI platform, also a set of tools and guidelines to speed up and increase the efficiency of risk assessment and validation procedures for HRC, particularly when measuring collision. Finally, in order to ensure an adequate feedback from end users and demonstration of the platform's functionalities, the consortium added MACHINEBOUW, an experienced robot integrator, and three manufacturing companies, which will provide three use-cases related to Domestic Appliances Assembly (WHIRLPOOL), Electronic Components Production (SCHINDLER) and Food Products Packaging (IMA).

Through ROSSINI, the limits to HRC spread expressed above will be systematically addressed:

| | | |
|--|--|---|
| <p>1) Safety requirements limiting applications in terms of speed and payload:</p> <p>the ROSSINI platform will allow for higher working speeds and reduced separation distance in HRC thanks to specific technological improvement at the level of sensing, control and actuation technology</p> | <p>2) Need to assess the safety of HRC at the level of application</p> <p>the ROSSINI holistic approach will carry out an effective harmonisation of different technologies through an integrated platform, thus ensuring the inherent safety of the developed applications</p> | <p>3) Lack of workforce acceptance in HRC</p> <p>The ROSSINI human-robot mutual understanding will improve the quality of the human job, and will provide an early assessment of the job quality impact on HRC already in the design phase</p> |
|--|--|---|

Figure 2-8: ROSSINI answer

2.5 Methodology

This section provides an insight into ROSSINI's structured and coherent approach and the technologies that will be developed and demonstrated. Besides implementing 4 synergic lines of research, and the integration of the results into one comprehensive platform for the design and validation of HRC application, ROSSINI will also develop 3 industrial demonstrators, which will act as technological showcases for the market replication and therefore for the full leverage of the market potential of exploitable results.

Methodology

Though a structured and coherent approach, ROSSINI will develop and demonstrate technologies enabling a significant advancement in HRC. Besides implementing 4 synergic lines of research, and the integration of the results into one comprehensive platform for the design and validation of HRC application, ROSSINI will also develop 3 industrial demonstrators, which will act as technological showcases for the market replication and therefore for the full leverage of the market potential of exploitable results. These are the 4 distinct lines of research of the Rossini Project:

| | | | |
|---|--|--|---|
| <p>Sensing Technology</p> <p>The RS4 (ROSSINI Smart and Safe Sensing System) will be the link between the environment and an efficient and safe movement of a robot in it, when at least a human operator is also present in the same environment.</p> | <p>Robot Control Technology</p> <p>In ROSSINI safety is transformed from an unforeseen barrier into a dynamic constraint to consider when dynamically planning the best sequence of actions to fulfil a desired task.</p> | <p>Robot Actuation Technology</p> <p>The ultimate goal of the project is to combine the best of both worlds to engineer a new generation of robots featuring the safety peculiarities of cobots and the high performances of industrial robots.</p> | <p>Human-robot mutual understanding</p> <p>Successful adoption of new and genuine human-robot collaborations, both increasing flexible production and improving the quality of the job</p> |
|---|--|--|---|

Figure 2-9: Partners sub-page: <https://www.rossini-project.com/methodology/>



2.5.1 Sensing Technology

This sub-page describes the Sensing technology that ROSSINI will have in order to have a good perception of its surroundings, and especially approaching humans.

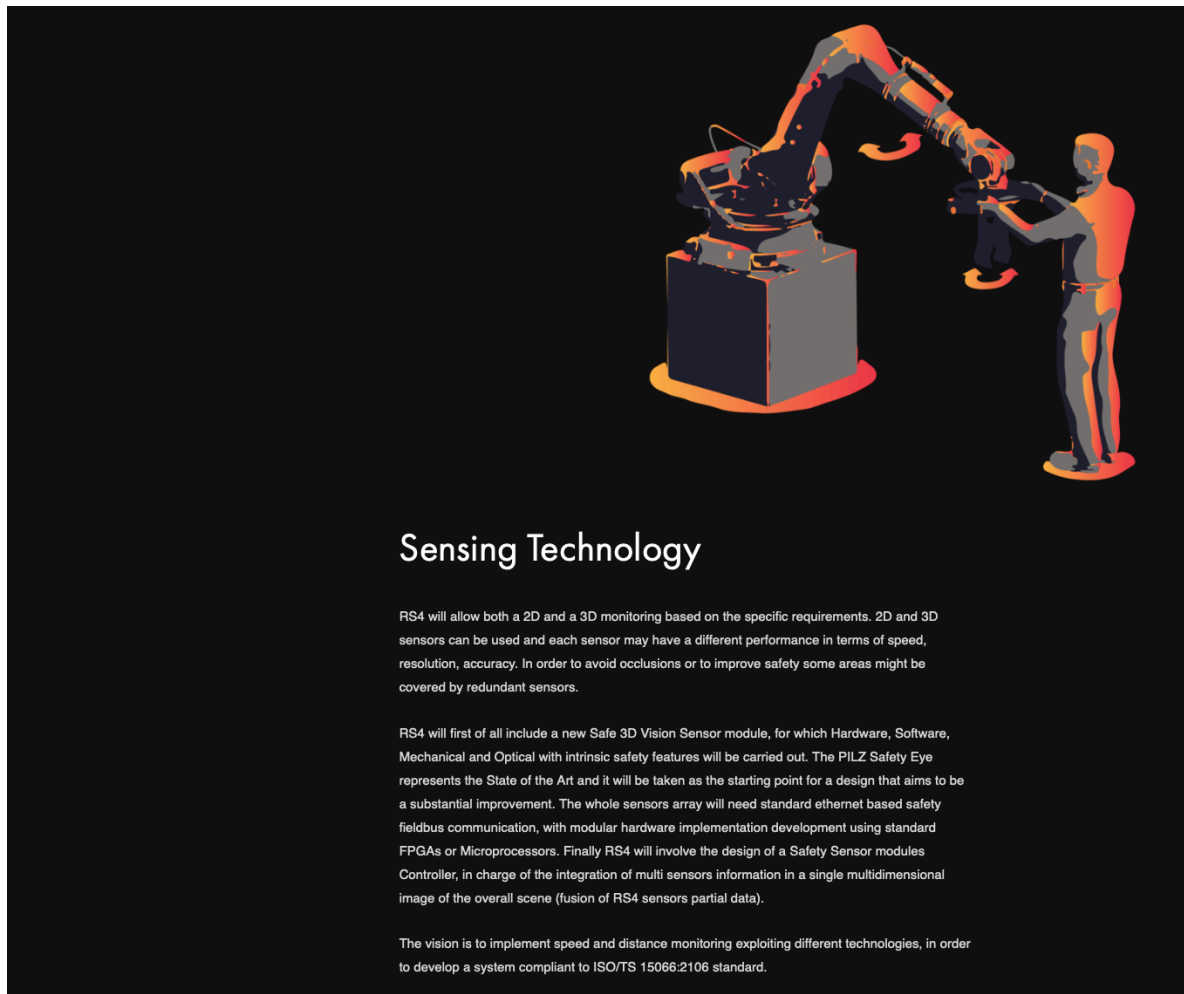


Figure 2-10: ROSSINI's Sensing Technology

2.5.2 Robot Control Technology

This sub-page describes the Control technology that ROSSINI will have in order to coordinate its actions to maximise collaboration and efficiency.



Figure 2-11: Figure 2-12: ROSSINI's Sensing Technology



2.5.3 Robot Actuation Technology

This sub-page describes how ROSSINI will engineer a new generation of robots featuring the safety peculiarities of cobots and the high performances of industrial robots.

Robot Actuation Technology

The ultimate goal of the project is to combine the best of both worlds to engineer a new generation of robots featuring the safety peculiarities of cobots and the high performances of industrial robots. Specifically, the focus must be placed on the ability of handling precisely and fast heavy objects with a collaborative robot and concurrently guarantee a high safety level for the human operator. In order to achieve the above mentioned goal, the following aspects have to be considered in the project:



a. Robot mechanical conceptual redesign.

A major mechanical redesign is needed in order to reduce the overall inertia of the robotic arm and ensure a stiffness level which eventually results in a positioning precision comparable to the one of standard industrial robots.

b. Force feedback

In most cases force detection is used to make the robot more collaborative. If an external force is applied to the robot, (by a human operator, for example), it is detected through motor current allowing the controller to make a decision on an alternative response like stop motion, reduce speed, or change direction. The new approach uses dual encoders, not only to improve joint accuracy, but for real time monitoring of the stiffness/compliance in each robot joint. Through this method, joint position and torque can be monitored together to provide safe information to the collaborative robot controller. With accurate torque and position monitoring force sensing, even in the presence of stiffness/compliance can be compensated for.

c. Dual-motor robot joint

In order to increase the intrinsic safety of the collaborative robot, the basic idea is to design a new concept of robot joint, provided with two motors, the first one responsible of the normal joint positioning during robot task execution, the second one acting as safety device for fast-retract of the robot in case of collision with a human.

With the newly designed robot 3 factors contribute to the reduction of the stopping distance:

- dual-motor joint with fast braking and retraction (20% expected reduction)
- dual-encoder joint with force feedback fast evaluation (10% expected reduction)
- mechanical robot redesign with reduction of total robot inertia (15% expected reduction)

Figure 2-13: Robot Actuation Technology

2.5.4 Human robot mutual Understanding

The last sub-page on the Methodology involves the principles that will be adopted to increase flexible production and improve the quality of the job. The Holistic approach of ROSSINI is given by describing its fundamental elements.



Human-robot mutual understanding

Successful adoption of new and genuine human-robot collaborations, both increasing flexible production and improving the quality of the job, requires a holistic approach in which:

1. human factors like user experience, comfort, trust, feeling of safety, and liability, are addressed and accounted for in the early design stages (Design Level);
2. constant monitoring of the process, human behaviour, and robot behaviour takes place and online changes to the original task planning can be made during operation (Adaptive Level);
3. profound mutual understanding between robots and people in operation is realized (Communication Level).



Design level

Elements to address in the design stage, is the explicit design of the human-robot interaction and the definition of human-robot collaboration scenarios. Here the work process is evaluated. Based on a task and capacity analysis it is investigated which actors (human and/or robot) can perform which task. Moreover, scenarios describe possible ways for humans and robots to interact. The scenarios indicate what information needs to be exchanged between actors to establish mutual understanding and successful job completion (Johnson et al., 2014). Furthermore the scenarios give a basic indication on how the workspace is designed (shared workspace, synchronous movements, basic safety implementations). An evaluation tool allows to assess job quality, productivity, flexibility, and configuration time for different collaboration scenarios in early stages of the design process.

Adaptive level

The adaptive level dispatches tasks to the actors according to the scenarios that were made. When the scenarios contain multiple execution paths the ACL should consider human and machine factors when dispatching tasks to humans or robots. Dispatching criteria are influenced by foreseeable and unforeseeable factors.

- Foreseeable: Inclusiveness of vulnerable workers, Day shifts / night shifts, training, scheduled equipment maintenance, etc.
- Unforeseeable: Sick leave, safety interventions, equipment failure, temporarily lowering of operator capacity, etc.

Communication level

To enhance smooth human robot interaction, human and robot must be mutually predictable and adequately estimate each other's intentions (Klein et al, 2004). Two key technologies to achieve this are:

- Estimating human intentions through sensor fusion
- Projecting robot intentions through augmented reality (AR)

Figure 2-14: Human-robot mutual understanding.



2.6 Platform

This section contains information on the 3 industrial environments that the ROSSINI Platform will be demonstrated. The first page involves the information about ROSSINI platform, and its key features that will allow effective and safe Human-Robot collaboration.

Platform

The Rossini Platform

The developed components are expected to be integrated in to the ROSSINI Platform architecture. The Platform can be represented as an integrated set of layers, each related to a specific dimension/function:

- The Sensing Layer will combine information from safe and non-safe sensors in a fusion module to feed the Safety Aware Control Architecture
- The Perception Layer, through the employment of artificial intelligence techniques, will generate a Semantic Scene Map integrating geometric and semantic information, which will in turn create a set of virtual "Dynamic Shells" for safety, surrounding each object in the scene
- The Cognitive Layer will be provided by a high-level scheduler, capable of dynamically planning a set of cooperative actions that the robot needs to execute, and to update them when the working environment conditions, captured by the Semantic Scene Map, change.
- The Control Layer will interpret the high-level action to execute and will generate the most efficient and safety preserving low-level plan for the robot, thus optimizing trade-off between safety and productivity in the workcell, ensuring that
- The Actuation Layer will encompass a novel concept of manipulators with built-in safety features, capable of reducing the separation distance between the man and the operator when performing collaborative applications, thus increasing the degree of freedom for robotic applications design
- The Human Layer will ensure the inclusion of human-related factors from the early design phases of collaborative applications design, and the constant monitoring of factors influencing job quality during robotic operations
- The Integration Layer will provide integrators with a set of tools and guidelines to ensure inherent safety in design of HRC applications, and to speed up application configuration and reconfiguration

Moreover, the platform will include also a set of methodologies and guidelines to improve application design and risk assessment in HRC. Recent research studies (R. Behrens, N. Elkmann, and H.-J. Ottersbach 2012) show that the difference between free and clamping impacts depends on how the involved robot and human masses are distributed. ISO/TS 15066 already provides a scaling factor that allows for switching measured impact results between both contact cases. The factor only applies if the effective masses, colliding at the contact point, are given. A method to estimate the robot mass is also available in ISO/TS 15066. It takes all link masses and their configuration account and estimate the mass at the considered contact point (in most cases the robot TCP). Besides this estimate, each robot manufacturer offers models with higher precision. Instead of providing a similar method for estimating the effective mass of the human body, ISO/TS 15066 recommends using the single weights of the particular body parts and neglects the body kinematics. From a scientific standpoint, this approach will lead to wrong and highly biased estimates that have the potential to a wrong risk evaluation and is therefore not accepted by official bodies. To ensure reliable estimates of body part masses, the ROSSINI Platform will include a simplified human body model that replicates the kinematics and mass distribution of a 50th percentile human. The development work to be carried out will include the development of the kinematics of the model, the integration with other available studies and the conversion the model in an algorithm. The inertia parameters will be derived from the result of a collision study with volunteers which was carried out in 2012 (ethical approved – see R. Behrens, N. Elkmann, and H.-J. Ottersbach 2012). The study goal was to determine the difference between constrained and unconstrained impacts. The results of this study can be considered as valid and enables the model to create reliable results.

Figure 2-15: Rossini Platform – the prerequisites of success. (www.rossini-project.com/platform)

2.6.1 Rossini Demonstration Activities

The use cases have been chosen trying to have the widest possible span in terms of application sector, tasks to be executed technologies to be deployed. A short description is given for each use-case and how ROSSINI will be deployed and which benefits will bring to the respective demonstrators.



ROSSINI Demonstration Activities

The ROSSINI Platform will be demonstrated into 3 industrial environments up to TRL6. The use cases have been chosen trying to have the widest possible span in terms of application sector, tasks to be executed technologies to be deployed.

Use Case #1 – Domestic Appliances Assembly (WHIRLPOOL)

In the WHIRLPOOL use case, ROSSINI will deploy the adaptive features of the Human Layer and the Safety Aware Control Architecture in a highly challenging context (continuous flow line) in terms of working speed. The manipulator will be chosen among commercial products, to demonstrate the platform potential to interact with and be wrapped around third party technologies.

Use Case #2 – Electronic Components Production (SCHINDLER)

In the SCHINDLER use case, ROSSINI will demonstrate the features of the Collaborative by Birth Robotic Manipulator, delivering a low payload robotic arm for electronic components production, integrated with the other platform components (sensing system, controller, etc.). Given the user's high production variability, the promised ROSSINI performance in terms of production reconfiguration cost savings will be tested.

Use Case #3 – Food Products Packaging (IMA)

In the IMA use case, ROSSINI will deploy a medium payload manipulator mounted on an AGV (mobile robotic platform). The Human Layer and the Control Architecture will be confronted with the challenge to manage navigation operations as well as other operations. Being IMA also a robot integrator, the demonstrator will be easily replicated.

Figure 2-16: Rossini Demonstration Activities

2.7 Partners

This last section briefly introduces all 13 partners of the project consortium. A description of each partner's organization is accompanied by a company logo which links to the respective organization's website.

Partners

These are the partners of the Rossini Project. You can find more about them by visiting their websites.

Project Coordinator:

Datalogic
Datalogic is a global leader in the automatic data capture and process automation markets, specialized in the designing and production of bar code readers, mobile computers, sensors for detection, measurement and safety, RFID vision and laser marking systems. Datalogic solutions improve the processes in the Retail, Manufacturing, T&L and Healthcare industries.

Whirlpool
Whirlpool Corporation (NYSE:WHR) is the worlds leading major home appliance company, with approximately \$21 billion in annual sales, 62,000 employees and 70 manufacturing and technology research centers in 2017. The company markets Whirlpool, KitchenAid, Maytag, Consul, Brastemp, Amana, Built-in, Jenn-Air, Indesit, Hotpoint and other major brand names in nearly every country throughout the world.

SUPSI
SUPSI, University of Applied Sciences of Southern Switzerland is one of the 7 UAS in Switzerland. It has a university statute focused on applied research. ISITSPS (Institute of Systems and Technologies for Sustainable Production) participates in a network of national and international centers for supporting SMEs. Key research areas are: Automation and Control, Mechatronic, Robotic, Artificial Vision Systems.

Pilz Group
The Pilz Group is a global supplier of products, systems and services for automation technology. Based in Ostfildern, near Stuttgart, the family-run company employs around 2,400 people. With 42 subsidiaries and branches around the world, Pilz supplies safe solutions for people, machinery and the environment.

IRIS
IRIS (http://www.inteltechnologygroup.com) is an advanced engineering & technology SME with operations in Barcelona, Madrid, and Dublin that works closely with industries around Europe to develop bespoke monitoring solutions that enable their transition to the Industry 4.0 paradigm. IRIS delivers R&D projects in the area of Process Analytical Technology, Photonics, IoT and ICT.

IMA-Machinebouw
IMA-Machinebouw wants to support entrepreneurs so that they can accomplish their ideas of added value & be successful. We do this by offering our customers an easy access to industrial technology. By using high quality components and offering high quality technical services, we develop and build innovative machines that consistently deliver the added value you need for your company.

IMA
Established in 1961, IMA is world leader in the design and manufacture of automatic machines for the processing and packaging of pharmaceuticals, cosmetics, food, tea and coffee.

Fraunhofer IFF
The Fraunhofer IFF is an institute of the non-profit Fraunhofer-Gesellschaft, a provider of contract-applied research. The institute is based in Magdeburg (Germany). It specializes in research and development in the fields of robotics, sensor systems, virtual engineering, logistics and process and plant management.

CRIT
CRIT is a private company specialized in the research and analysis of technical and scientific information and in the development of research project activities.

Schindler
Schindler was founded in 1874 in Lucerne, Switzerland, and is one of the world's leading providers of elevators, escalators, and moving walks.

UNIMORE
University of Modena and Reggio Emilia (UNIMORE) is organized on a "wide network" model embracing the cities of Modena and Reggio Emilia (Italy). In close cooperation with surrounding economic clusters (more than 300 companies, most of them in the area of mechatronics, logistic and automotive in one of the richest economic area in Italy). UNIMORE participates to the project through the research group of Automation, Robotics and System Control Lab (ARISControl, www.ariscontrol.org) and it will focus on the control architecture of the ROSSINI platform.

TNO
TNO connects people and knowledge to create innovations that boost the competitive strength of industry and the well-being of society in a sustainable way. This is our mission and it is what drives us, the over 3,200 professionals at TNO, in our work every day. We work in collaboration with partners and focus on nine domains:

- Buildings, Infrastructure & Maritime: "Robust constructions, sustainable use"
- The Circular Economy and the Environment: "Directing and accelerating sustainability"
- Defence, Safety and Security: "We are putting our knowledge and technology to work for safety and security"
- Energy: "Faster towards a sustainable energy supply"
- Healthy living: "Focusing on participation, not on the disease"
- Industry: "Innovating for employment, welfare and well-being"
- Information & Communication Technology: "Interpreting and accelerating digital transformation"
- Strategic Analysis & Policy: "Turning complex issues into concrete innovations"
- Traffic and Transport: "Helping to create liveable, sustainable cities"

Figure 2-17: Rossini's Consortium



3 Additional Pages

The website will be constantly updated based on the project progress and its outcomes. Some additional pages and sections that are considered to have added value and being investigated to be introduced are:

News

As the project will progress, and the respective dissemination and communication activities will be increased, the consortium website will have a section “News” where providing all relevant and updated information on the Project status. In this way, the audience be updated about the industry and the whole sector actions and progresses.

The ROSSINI social media

The management of the website will be backed up also by making usage of LinkedIn). LinkedIn will be used by consortium to attract attention and consequently raise the awareness levels of the project. The existing social network channels of the consortium partners will be widely exploited to enhance the project activities and results towards the target audiences.



4 ANNEX - Privacy Policy of Rossini website

Privacy Policy

A Privacy Policy will be available on the website in order to inform the site's users about the processing of their personal data, whether applicable, when using or accessing to the website.

The Privacy Policy will reflect the privacy arrangements agreed by the consortium's members and will include a specific "cookies policy" explaining what cookies are present and how they are used.