



DiManD ITN Call for Applicants

This guide is to provide practical information to potential applicants on how to apply, together with a description of the assessment procedure. For further and up-to-date information, please visit the website <https://DimandITN.eu/>

H2020-MSCA-ITN European Training Network. Grant 814078

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1 ABOUT DiManD ITN

The Digital Manufacturing and Design (DiManD) Innovative Training Network (ITN) is a European Training Network (ETN) programme that will provide high-quality multidisciplinary, multi-professional and cross-sectorial research and training to high-achieving early stage researchers in the area of **Industrie 4.0**. DiManD comprises a well-balanced consortium that spans six European countries and incorporates academic and industry sectors to promote international, interdisciplinary and inter-sectoral aspects of ESR skill development.

Applications are now invited for 14 Early Stage Researcher (ESR) positions on the DiManD ITN employed by beneficiaries of the consortium

Successful candidates will undertake 3-year PhD programmes in the area of Industrie 4.0, co-hosted by academic and industry members of the consortium, with positions preferably starting in October 2019.

The closing date for applications is 23:00 (CET) on 29th June 2019. *ESR1 and ESR2 will have an extended deadline until 7/07/2019 to meet UK visa-sponsorship requirements*

Further details about the research programme, applicant eligibility criteria, ESR projects and application procedure are provided in this document, with up-to-date information available on the DiManD ITN website at <https://DimandITN.eu/>.

1.1 ABOUT THE RESEARCH PROGRAMME

DiManD aims to develop a high-quality multidisciplinary, multi-professional and cross-sectorial research and training framework for Europe with the purpose of improving Europe's industrial competitiveness by designing and implementing an integrated programme in the area of intelligent informatics driven manufacturing that will form the benchmark for training future Industrie 4.0 practitioners.

The research programme will deliver a step change by increasing manufacturing productivity and enhancing global competitiveness of the European manufacturing sector as well as contributing to job creation by offering, for the first time, a new holistic approach to both research and training in Manufacturing Informatics. It breaks with traditional approaches to research and is predicated on three key research challenges: big data analytics; industrial Internet of Things; and autonomous systems control, which are at the core of the **Industrie 4.0** vision. The research will be accompanied by a holistic training programme that provides the 14 Early Stage Researchers (ESRs) with a multidisciplinary skillset comprising computer science, psychology, physics and engineering.

1.2 PARTICIPATING HOST ORGANISATIONS

Successful researchers will enrol in one of the 14 ESR positions available across the host organisations of the DiManD ITN:

1. Mondragon Goi Eskola Politeknikoa (MGEP), Spain
2. Consiglio Nazionale delle Ricerche (CNR) (STIIMA), Italy,
3. Petronor Innovación (Petronor), Spain [To be approved by EC]

4. Kungliga Tekniska Hoegskolan (KTH), Sweden
5. Fundación Tecnalia Research & Innovation (TECNALIA), Spain
6. TQC Ltd (TQC), United Kingdom
7. University of Nottingham (UNOTT), United Kingdom
8. UNINOVA – Instituto de Desenvolvimento de Novas Tecnologias (UNINOVA), Portugal

From the 8 host organisations (Beneficiaries) of the DiManD ITN, there are 4 academic institutes (UNOTT, KTH, MGEP, UNINOVA), 2 research centres (STIIMA, TECNALIA) and 2 industry organisations (Petronor, TQC). Together, they bring expertise in computer science, manufacturing engineering, mechatronics, human factors, business and management to the DiManD network.

In addition to the Beneficiaries, a broad range of partner organizations will be active in the DiManD ITN: 15 industrial partner organizations and 4 academic partner organizations have agreed to contribute to a range of activities to the consortium including providing training and expertise, hosting secondments etc. The current list of partner organisations of DiManD ITN comprises:

1. Brunel University, London, United Kingdom
2. Cupersafety Srl, Italy
3. Danobat Group S. Coop, Spain
4. Fagor Arrasate, S. Coop, Spain
5. GAIA, Spain
6. HOLOS SA, Portugal
7. Ideko S. Coop, Spain
8. INTROSYS SA, Portugal
9. MONDRAGON Corporación Cooperativa S. Coop, Spain
10. MSI Grupo, Spain
11. Manufacturing Technology Centre, United Kingdom
12. University of Chemical Technology and Metallurgy, Bulgaria
13. SenseAir AB, Sweden
14. Ingel Srl, Italy
15. Somacis SpA, Italy
16. Susan Reiblein Consulting, United Kingdom
17. Ulma Embedded Solutions, Spain
18. Virginia Polytechnic Institute and State University, USA
19. Universidad del País Vasco, Spain

2 CALL FOR APPLICANTS

2.1 WHY APPLY?

ITNs are financially supported by the European Commission under the Marie Skłodowska-Curie Actions (MSCA) because they provide excellent research, training and career aspects. The benefits of being a PhD student in an ITN network include:

- You will get the chance to participate in specially developed courses (e.g. on specific techniques, academic soft skills)
- You can start building your personal professional network at a very early stage of your career due to the embedding of our PhD projects in an academic/industrial network
- You will be exposed to industry and the challenges in industry already during the PhD, because we have partners from industry in our network (who also contribute to the training)
- You will get the opportunity to spend some time in the labs of other partners (thereby you will get familiar with other disciplines, techniques, cultures etc.), as the research projects are designed such that they will mostly have interdisciplinary components
- You will be advised by excellent group leaders – they are all outstanding in their research and training

2.2 BENEFITS & SALARY

The ITN programme offers a highly competitive and attractive salary and working conditions. The successful candidates will receive a salary in accordance with the MSCA regulations for early stage researchers.

The salary includes a generous living allowance, a mobility allowance and a family allowance (depending on family situation) comprising:

- Living Allowance of €3270/month (gross) to be paid in the currency of the country where the Host Organisation is based and with a correction factor to be applied per country. The exact (net) salary will be confirmed upon offer and will be based on local tax regulations and on the country correction factor (to allow for the difference in cost of living in different EU Member States)
- Mobility allowance of €600/month to be paid to all ESRs recruited
- Family allowance of €500/month, depending on family situation

The guaranteed PhD funding is for 36 months (i.e. European Commission funding, additional funding is possible, depending on the host organisation and in accordance with the regular PhD requirements in the country of PhD registration).

In addition to their individual scientific projects, all fellows will benefit from further continuing education, which includes internships and secondments, a variety of training modules as well as transferable skills courses and active participation in workshops and conferences. This training will be payed by the institution that employs the ESR, using the *Research, training and Networking costs* part of the budget.

2.3 ELIGIBILITY CRITERIA

Applicants need to fully comply with four eligibility criteria:

- **Academic Qualification:** The applicant has obtained a Degree that formally entitles them to embark on a doctorate in the host country. The degree should be in the area specified by the ESR project (or related disciplines).
- **Early-stage researchers (ESR)** are those who are, at the time of recruitment by the host, in the first four years (full-time equivalent) of their research careers. This is measured from the date when they obtained the degree which formally entitles them to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the research training is provided, irrespective of whether or not a doctorate was envisaged. Please note applicants cannot already hold a PhD.
- **Conditions of international mobility of researchers:** Researchers are required to undertake trans-national mobility (i.e. move from one country to another) when taking up the appointment. At the time of appointment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the 3 years immediately prior to their recruitment. Short stays, such as holidays, are not taken into account. Researcher from any country (not only from European Union) are welcome to apply.
- **English language:** ESR candidates must demonstrate that their ability to understand and express themselves in both written and spoken English is sufficiently high for them to derive the full benefit from the network training. Non-native English speakers are required to provide evidence of English language competency before the appointment is made. An IELTS score of 6.5, or equivalent, is the minimum requirement.

2.4 ESR ROLES & RESPONSIBILITIES

All ESRs recruited will be expected to carry out the following roles:

- To manage and carry out their research project within 36 months
- To write a PhD dissertation
- To participate in research and training activities within the DiManD network
- To participate in meetings of the DiManD projects
- To disseminate their research to the non-scientific community, by outreach and public engagement
- To liaise with the other research staff and students working in broad areas of relevance to the research project and partner institutions
- To write progress reports and prepare results and write articles for publication and dissemination via journals, presentations, videos and the web
- To attend progress and management meetings as required and network with the other research groups

3 ESR PROJECTS

3.1 ESR INTERNATIONAL & INTERSECTORAL SECONDMENTS

The DiManD ITN is a European Training Network (ETN) programme where a group of 14 Early Stage Researchers (ESRs) will be trained within world-leading groups and will be introduced to Industrie 4.0 to exploit advances in fundamental research towards innovative applications. To “enable” this vision, each trainee will have access to closely integrated complementarities and world-class expertise in the field of digital infrastructure (MGEP, TECNALIA, UNOTT), data informatics (MGEP, UNINOVA, UNOTT), human factors (UNOTT, MGEP), mechanical engineering (STIIMA, KTH, TECNALIA, TQC), manufacturing engineering (Petronor, MGEP, UNINOVA, UNOTT) as well as business aspects (Petronor, TQC).

Additional cross-disciplinary training (intellectual property, Responsible Research and Innovation, patenting, entrepreneurship, communication, open science, gender balance awareness, etc.) and a strong involvement on the part of the two industries (Petronor, TQC) and research centres and universities (UNOTT, STIIMA, KTH, MGEP, TECNALIA and UNINOVA) will provide the students with transferable skills and complementary competencies which will improve their research training and enhance their future employability

3.2 PROJECT DETAILS

The projects associated with the 14 ESR positions available in the DiManD ITN are as follows:

ESR 1 – A concept for open evolvable assembly systems

Project Description: The project will develop a model for evolvable assembly systems that will define and capture the dynamics of the product-process-system evolution building on previous work such as the PROSA and ADACOR holonic architectures. An integrated architecture for evolvable assembly systems will be developed targeting system adaptation at unit, station and system level. This architecture will be defined through a semantic model at physical, virtual and application layers and through resource object models that describe the physical resources and capabilities (in terms of skills and processes, including legacy systems) as well as the generic function-structure-behaviour interactions at different levels of system granularity. These objects will provide the basis for resource virtualisation and each one will be associated with a real-time intelligent cognitive agent therefore making all individual interactions accessible to self-learning and self-adaptation. Every agent will be able to use a suite of reactive plans that can be selected at run time to achieve the agent's local goals based on their current context. The model will support resource evolution of structure, capability and key performance characteristics by updates to the agent's plans and synthesis of new global behaviours. These global behaviours will emerge through composition of novel "virtual" agents from the pre-existing "concrete" ones through online coordination protocols. The group of "virtual" agents will be able to collectively achieve the desired target behaviour that none of the "concrete" ones individually knows how to.

Host Institution: University of Nottingham (UNOTT), United Kingdom

Planned Secondments: UNINOVA, KTH, STIIMA and MTC

Lead Supervisors: UNOTT - Prof Svetan Ratchev, Dr Brian Logan, Dr Jack Chaplin

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



**University of
Nottingham**

UK | CHINA | MALAYSIA

ESR 2 – Self-learning for Optimum Manufacturing Equipment (Individual & Collective Response)

Project Description: It is recognised that current adaptive control systems cannot effectively cope with unanticipated external or internal disturbances. The project will focus on developing machine learning methods, building upon existing works such as reinforcement learning, to allow both individual and collective self-learning and self-certification within a regulated environment. The learning process will utilise the status data, past experiences and key parameters to analyse possible scenarios and propose actions for achieving the individual and collective goals. Newly learned skills, combined with the context in which they are relevant, will supplement the predefined set of user-supplied skills and will be used individually or collectively to respond promptly when similar situations arise in the future.

Host Institution: University of Nottingham (UNOTT), United Kingdom

Planned Secondments: UNINOVA, KTH, STIIMA, UCTM

Lead Supervisors: UNOTT - Prof Svetan Ratchev, Prof Atanas Popov, Dr Giovanna Martinez Arellano

For further details or queries about this project, please contact

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To apply for this position please visit: <https://DimandITN.eu/applications/>



**University of
Nottingham**

UK | CHINA | MALAYSIA

ESR 3 – Cyber-Physical Systems and User Interaction Experience into Industrie 4.0

Project Description: Cyber-Physical Systems technology is a crucial key enabling technology that forms the basis for the development of many innovative products and services in highly developed economies. They control almost all types of products with electronic devices, from health parameters to a building, from an airbag to a production line, from a satellite to a car. Appropriate multidisciplinary research will be developed and its results will be verified and validated in different scenarios. This will be focused on: (i) Monitoring and Adaptive Control based on Advanced Signal Processing, (ii) Big Data and Optimisation, (iii) Real Time and Distributed Systems and Interoperability, (iv) Functional Safety, and (v) Cyber Security.

The research will address this new environment which makes it possible to generate a large amount of data. However, it is the significance of the data, not the volume where the opportunities lie. Cyber-Physical Systems will demand new User Interaction Experiences with data technology. Thus, the previously accepted process used should be reversed; to identify the stakeholders that are involved in the process; clarification and identified of the information required by each stakeholder, how they want, when and why they need it, serving the right personnel with the right information in the best channel and with the right reliability level. Techniques will be developed that allow users to obtain deep insights, explore, and understand large amounts of information effectively.

Host Institution: Mondragon Goi Eskola Politeknikoa (MGEP), Spain

Planned Secondments: MSI, IDEKO, ULMA, UNINOVA.

Lead Supervisors: MGEP- Dr Felix Larrinaga & Dr Ganix Lasa

For further details or queries about this project, please contact

dimand.mgep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 4 – Human Centred Design for Industrie 4.0. Advance service innovation

Project Description: In future Industrie 4.0 scenarios, manufacturing companies will need to incorporate Human Centred Design skills to link deep customer knowledge, with resources and digital data flows in one single system. European manufacturing companies must be capable to design these human (user), machine (product) and digital data systems, and transform them into marketable advance product-service solutions.

Given the developments in Digital Manufacturing, European companies will need a more holistic approach to design and deliver interconnected product, service and digital interfaces' system solutions. Human factors are commonly underestimated within Digital Manufacturing frameworks. Design as a driver and enabler of human centred innovation could complement Industrie 4.0 innovation activities and help manufactures to go beyond technological innovation.

An appropriate Design method will be developed, this method will be validated in different European manufacturing sectors in order to design advance product-services in Digital Manufacturing scenarios. This methodology will allow European manufacturers to: (i) overcome internal organisational barriers for Industrie 4.0 offerings, (ii) identify the needs of the different value network stakeholders through user research techniques, (iii) co-create and prototype with the different value network stakeholders in order to offer more complete service offerings minimising market failures, (iv) visualise and develop service scenarios using system visualisation tools to help customers and providers to understand how advance service offerings work, and (v) develop and deliver the appropriate customer solutions.

Host Institution: Mondragon Goi Eskola Politeknikoa (MGEP), Spain

Planned Secondments: DANOBAT, FAGOR, KTH

Lead Supervisors: MGEP - Dr Ion Iriarte & Dr Ganix Lasa

For further details or queries about this project, please contact

dimand.mgеп@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 5 – Simulation-based Runtime Testing and Adaptation of Cyber Physical Systems using digital twins

Project Description: A digital twin is a digital replica of an industrial asset, process or system that enables companies to better understand and predict future behaviour and performance of their machines. The digital representation provides both the elements and the dynamics of how an asset operates and lives throughout its life cycle. Digital twins integrate artificial intelligence, machine learning and software analytics with data to create living digital simulation models that update and change as their physical counterparts change. In Industrie 4.0 digital twins could be used for optimizing the operation and maintenance of physical assets, systems and manufacturing processes, virtual commissioning, machine process simulation, user or operator training, simulation-based design, etc. A physical asset can have a virtual copy running in the cloud that gets richer with every second of operational data.

Digital Twins could be used for improving the design and testing of Cyber-Physical Systems in Industrie 4.0. This will be focused on: (i) Co-simulation, (ii) Simulation-based Runtime Testing, (iii) Usage of historical operation data, (iv) Tracking mode simulation and (v) Functional Safety. The research will address a co-simulation scenario where simulators of relevant engineering disciplines (processes, assembly, electronics and electrical, information systems, etc.) of the cyber-physical system are used online and parallel with its real counterpart and a large amount of historical operational data is available. In this context, simulation-based testing using historical data and machine learning may allow to predict future behavior and performance even in uncertain scenarios using the digital twin to explore next situations and alternatives. Moreover, tracking mode simulation allows the model adjustment to real data.

Host Institution: Mondragon Goi Eskola Politeknikoa (MGEP), Spain

Planned Secondments: KTH, UNOT, UES, UNINOVA, IDEKO

Lead Supervisors: MGEP - Dr Leire Etxeberria & Dr Goiuria Sagardui

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



**Mondragon
Unibertsitatea**

**Faculty of
Engineering**

ESR 6 – Cyber-Physical Systems and End of life management in home automation

Project Description: The diffusion of mechatronics products and Printed Circuit Boards (PCBs) is constantly increasing in several domains of applications, triggered by their fast technological trend. End-Of-Life (EOL) management of these products is not currently globally approached in terms of processes efficiency and sustainability, and environmental impacts. This is due to the lack of integrated, automated and flexible systems and devices enabling their treatment under economically and environmentally sustainable conditions.

This project aims at tackling the abovementioned issues by developing digital and physical tools and methodologies for the automatic management of EOL operations, with a specific focus on robotic disassembly and sorting, under the general objective of achieving an advanced convergence between cyberspace and physical space, through AI-based on big data and robots in a human centered super smart Society 5.0.

Host Institution: Consiglio Nazionale delle Ricerche (CNR) (STIIMA), Italy, PhD registration with University of Brescia

Planned Secondments: CUPER, INGEL, ULMA, MGEP, INGEL

Lead Supervisors: STIIMA - Dr Irene Fassi & Dr Lara Rebaioli

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 7 – Precision manipulation and assembly of electro-optical components

Project Description: The research will contribute towards the developing of specific system abilities for the automatic precision assembly of optoelectronic components, such as dependability, interaction and perception ability, cognitive ability, decisional autonomy, manipulation ability, motion ability, adaptability and configurability.

In recent decades, a number of mechatronic devices have been developed for different applications and their use have been expanding. A suitable integration of mechanical, information technology and electronic features is required, that allow both to enhance the capabilities and the performance of standard products and to enable the conception and development of new generation systems facing the high-demanding requirements of an increasing market. Products of daily usage such as cars, mobile phones and computers rely on electronics and contain Printed Circuit Boards (PCBs). Specifically, the research project will tackle innovative and efficient methods and reconfigurable tools for handling miniaturised electro-optical components for the development of a selective, flexible and efficient manufacturing and re-manufacturing of PCBs and effective implementation of backplanes and boards with embedded three dimensional electro-optical parts

Host Institution: Consiglio Nazionale delle Ricerche (CNR) (STIIMA), Italy, PhD registration with University of Brescia

Planned Secondments: CUPER, INGEL, KTH, MTC

Lead Supervisors: STIIMA - Dr Irene Fassi & Dr Serena Ruggeri

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 8 – Design and development of cost-effective solutions for High throughput, mixed model electronic assembly and packaging

Project Description: This project will support the development of a small assembly line for the production of SenseAir's latest product, an automotive alcohol-sensor. The work is carried out with AutoLiv AB who are responsible for the marketing and registration of the product at EC level. Production processes will be carried out using existing equipment which include automatic gluing and soldering processes. The work will also focus on the effects of new business models on the company and its sub-suppliers.

The project goal is two folded: The first goal is to perform a DFA (Design For Assembly) and a DFAA (Design For Automatic Assembly) analysis in order to understand how the product design can be improved to facilitate its assembly (both manual and automatic will be investigated). This work will be carried out with SAIR and KTH support and will ensure the selection of a cost-effective product design. The secondary goals of the project are supporting the development of the actual assembly line and the User-Interface through which the configuration and deployment of the assembly system can be managed by a conventional operator.

Host Institution: Kungliga Tekniska Hoegskolan (KTH), Sweden

Planned Secondments: SAIR, MTC

Lead Supervisors: KTH - Prof Mauro Onori & Prof Antonio Maffei

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 9 – Investigation of Transition Technologies to support Assembly Station Reconfiguration in the automotive industry

Project Description: The project will finalise a door assembly station for the automotive industry. The aim of the project is to enable full re-configurability of the robot and its peripheral equipment for future variants and new products. The project will develop commercial PLC approaches into the INTROSYS development called DNA, which is an extension of the evolvable paradigm. This project intends to demonstrate the transition between the current centralised PLC control paradigm to the purely multi-agent, distributed control approach used in evolvable systems.

Starting from a fully featured job description the first step is to extract and describe all the featured processes in a structured manner. In particular all the necessary low level tasks must be identified and, consequently, allocated to both a particular subset of product variants that requires it and on the particular piece of equipment devoted to perform it. The result of this analytical step is a so called “taxonomy of the processes”

Host Institution: Kungliga Tekniska Hoegskolan (KTH), Sweden

Planned Secondments: INTROSYS, MTC

Lead Supervisors: KTH - Prof Mauro Onori & Prof Antonio Maffei

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 10 – Self-learning Cyber-Physical Production Systems

Project Description: This project will result in a clear understanding of current state of the art best practices in the usage of Cyber-Physical Systems in manufacturing environments, especially in what concerns control, re-configuration, monitoring and diagnosis of a concrete shop-floor. At the end, a methodology will be produced towards guiding the usage of CPS in this context. An important issue is self-learning ability to improve adaptability and evolvability of the manufacturing system, which requires Big-Data and learning training. Hence, the proposed methodology will assess the requirements present in the design of one of these systems and a list of design principles that must guide these developments in future projects.

Host Institution: UNINOVA – Instituto de Desenvolvimento de NovasTecnologias (UNINOVA), Portugal

Planned Secondments: HOLOS, SAIR, KTH, UNOTT

Lead Supervisors: UNINOVA - Prof Jose Barata & TBD

For further details or queries about this project, please contact

dimand.mgep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 11 – Developing Energy Saving Techniques and Tools in Production Systems

Project Description: This project objectives will be two-fold: on one hand side, a clear understanding of energy reduction constraints at the device / shop-floor level; on the other hand side, the device information awareness level, based on Big-Data, will pursue an optimization of the device configuration evolution towards the reduction of energy consumption

Host Institution: UNINOVA – Instituto de Desenvolvimento de NovasTecnologias (UNINOVA), Portugal

Planned Secondments: HOLOS, INTROSYS, KTH, UNOTT

Lead Supervisors: UNINOVA - Prof Jose Barata & TBD

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 12 – Flexible Robotics

Project Description: The variety of manufactured products is increasing exponentially. A single factory can produce nowadays between hundreds to thousands of different references in a single year. In this context comes up Industry 4.0 paradigm. Among the main goals that it pursues, zero defects and unitary production are two of the most relevant ones. The aim of this ESR is to explore and develop a new approach towards this two of challenges.

The stated proposal is to provide automation capability to quality control tasks. These tasks will be made by robots equipped with smart machine vision devices that can make the inspection in an adaptive strategy. This approach pursues to develop automated inspection system that can adapt themselves to new references. This will be done by merging deep learning techniques and adaptative control models. Deep learning will provide the capacity to recognize defects and to learn what can make a piece defective or not and apply this knowledge to new incoming references. Adaptive control models will provide the robot's trajectory for each inspection reference by using the digital information for the manufactured piece and by linking it with the input data from the deep learning module. All of this will be integrated with low inertia robots in order that humans and robots can share workspace.

Host Institution: Fundación Tecnalia Research & Innovation (TECNALIA), Spain, PhD registration with UPV/EHU

Planned Secondments: Petronor, UPV/EHU

Lead Supervisors: TECNALIA –Dr. Estibaliz Garrote & TBD

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 13 – Artificial Intelligence applied to Oil & Gas *[To be approved by EC]*

Project Description: The digitalization process is reaching to nearly all our daily activities. The oil sector is also immersed in the industry 4.0 new revolution. The requirements of a new era, more conscious of environment and society, and in development inside a global economy, need a new generation of tools powered by artificial intelligence capabilities.

The stated ESR is focused in the study and development of new process control models based on artificial intelligence techniques with special accent in machine learning methods and deep learning techniques. Potentially, the work will also include computer vision developments. The goal is the development of algorithms for optimization of production processes generated during the refinement of oil. The new possibilities that deep learning techniques offers will allow to tackle down challenges present and contribute to the industry 4.0 paradigm. At the same time the ESR will allow the candidate to work in a real production plant, collaborating with the research team.

Host Institution: Petronor Innovación (Petronor), Spain, PhD registration with UPV/EHU

Planned Secondments: UPV/EHU, TECNALIA

Lead Supervisors: Petronor - Dr. Itziar Landa & TBD

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



ESR 14 – Development of data models and adaptation strategies for intelligent products

Project Description: Research projects on evolvable assembly systems have typically concentrated on models of the overall system but often made assumptions about the intelligent instruments and components that are the building blocks of the system. Many modern assembly systems adopt a 'no-faults forward' philosophy, which entails integrating testing processes throughout the assembly sequence. It is desirable that testing equipment can be readily integrated at key points in the automated manufacturing line, and that the data it produces can be used for quality assurance, traceability and decision making (both during the specific process cycle and as a response to trends).

This project is a case study into the development of intelligent (test) instruments and their application within assembly systems using, for example, plug-and-produce concepts, product-driven production, data collection and analytics through cloud-based services. TQC as a leader in the production of integrated assembly and test systems will provide a practical base for proving the models and adaptation strategies for intelligent products.

The case study is based on the Micro Applications Leak Tester (MALT) instrument that TQC has designed and produced. MALT is a high-precision compact low cost leak testing instrument that is used on a significant number of TQC systems. It has a powerful processor with a network interface that supports external data collection and configuration. However, further development is required to achieve the step-change to make MALT into a product-driven testing unit and to integrate it with Cloud services.

At TQC the ESR can engage with and access bespoke assembly systems from concept to delivery, which gives the opportunity to apply and test theories at appropriate places in the development process. A wider investigation may also address the barriers that SMEs face in adopting cyber physical systems

Host Institution: TQC Ltd (TQC), United Kingdom, PhD registration with UNOTT

Planned Secondments: UNINOVA, KTH

Lead Supervisors: TQC - Mark Jones & Leszek Zarzycki

For further details or queries about this project, please contact

dimand.mqep@mondragon.edu

To apply for this position please visit: <https://DimandITN.eu/applications/>



TQC
Automation & Test Solutions

4 APPLICATION PROCEDURE

4.1 CONTENT & SUBMISSION OF YOUR APPLICATION

All applications must be submitted through the on-line recruitment portal on the DiManD ITN website <https://DimandITN.eu/applications/> and candidates may apply for up to three ESR positions by indicating their preferences on the application form.

Your application consists of two parts:

1. **An online application form:** On the online form, you are requested to fill in information that is aimed to facilitate the eligibility check of your application and to identify the ESR position(s) you are applying for.
2. **PDF application file:** You must include a Curriculum Vitae ([Europass format](#)) and motivation letter in a single PDF file when submitting this application file.

Closing date for receipt of applications is 23:00 (CET) on 29th June 2019

All positions are recruited in line with Open, Transparent, Merit (OTM) and Competency based recruitment.

4.2 KEY DATES

- 15/5/2019: Launch and advertise 14 ESR positions
- 29/6/2019: Deadline for on-line application. *ESR1 and ESR2 will have an extended deadline until 7/07/2019 to meet UK visa-sponsorship requirements*
- 5/7/2019: Circulation list “preselected candidates”
- 18/7/2019 – 19/7/2019: DiManD Recruitment Event (Date TBC)
- 22/7/2019: Circulation list “recruited DiManD ESRs”. The week after the Recruitment Event
- 1/10/2019: Target start date for ESR contracts

5 SELECTION & EVALUATION CRITERIA

5.1 ELIGIBILITY CHECK

All applications will be checked according to the eligibility criteria. Only eligible applications will be processed to the next evaluation stage.

- The applicant is an Early Stage Researcher
- The applicant complies with the mobility rule for the project(s) applied for
- The application is complete, in English and submitted through the online form before the deadline

5.2 PRESELECTION PROCEDURE

Eligible candidates will be ranked by the recruitment committee (formed by principal supervisors of the ESRs) according to the following assessment criteria:

- Scientific/Academic background and merits to date
- Professional experience
- Motivation

Candidates who are ranked sufficiently high for an ESR position will be invited to attend the Recruitment Event.

5.3 RECRUITMENT EVENT

Preselected candidates will be invited to a 2-day recruitment event which will be held in Spain 18-19 July 2019 (Date TBC):

- On Day 1, DiManD will be presented to candidates through a series of educational workshops and seminars
- On Day 2, recruitment interviews will take place and each candidate will give an open presentation on their view regarding current and emerging opportunities for Digital Manufacturing with a focus on Europe

The selection panels will make the final decision about the successful candidates after this event. The selection panels will include ESR Supervisors from at least 2 different disciplines and countries, a non-academic member, and an adequate diversity (and gender balance) will be assured.

Prior to the recruitment event, skype interviews between the Supervisors and the candidates are recommended, along with on-line personality tests.

In order to facilitate their travel, preselected candidates (from outside Spain) will receive a maximum of €250 (paid by the project coordinator). In order to avoid delays in reimbursements, candidates are asked to keep all invoices and tickets (e.g. train, plane, hotel...).

For the preselected candidates that can not travel, remote attendance options will be enabled.

The final decision on who to recruit will be communicated the week after the Recruitment Event. The selected ESRs will start their research as quickly as possible (target: 1 October 2019).

6 FURTHER INFORMATION

For further and up-to-date information, please visit the website <https://DimandITN.eu/> , or contact us at dimand.mgep@mondragon.edu

7 FUNDING



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