Call for Expression of Interested Beneficiaries

Marie Skłodowska-Curie Doctoral Networks
HORIZON-MSCA-2021-DN-01 or 2022 Call

The Marie Skłodowska-Curie Action of Doctoral Networks (MSCA DN) provides doctoral candidates with the opportunity to acquire new skills and knowledge, and expand their network. At the same time, MSCA DNs improve the quality of doctoral training and R&I capacity of the participating organisations, as well as their interdisciplinary and inter-sectoral cooperation. The objective of MSCA DN is to support doctoral programs carried out by a consortium composed of members from the academic and non-academic sectors.

The University of Malta (UM) fosters the interoperability, synergy and integration of approaches from all Faculties and Departments such as ENGINEERING (ALL FIELDS), ARTIFICIAL INTELLIGENCE, COMPUTER SCIENCE, MEDIA AND KNOWLEDGE SCIENCES, MEDICINE, BIOLOGY, MATHEMATICS, PHYSICS AND SOCIAL SCIENCES. At the UM there are over 11,000 students including over 750 foreign/exchange students from 82 different countries, following full-time or part-time degree and diploma courses. The degree courses at the University are designed to produce highly qualified professionals, with experience of research, who will play key roles in industry, commerce and public affairs in general. The University has been involved as coordinator and partner in numerous EU-funded projects under various Programmes including FP5/6/7, Horizon 2020, Lifelong Learning Programme, Culture 2000, Tempus, Erasmus+, INTERREG EU-MED-ITALIA MALTA, ENPI CBC MED and various other international and national programmes and initiatives. The University is also represented in a number of European and International University networks and groups.

We search for *interested beneficiaries and partner organisations*, which will contribute to the establishment of an innovative DN - Network. The consortium will emphasize on training the new generation of creative, entrepreneurial and innovative researchers, so they will be able to face current and future challenges and to convert knowledge and ideas into products and services for economic and social benefits. We are committed to support excellent science and strengthen the research and doctoral training capacity, going beyond the traditional academic research training setting with the right combination of research-related and transferable competencies. Moreover, we intend to provide enhanced career perspectives in both the academic and non-academic sectors through international, interdisciplinary and inter-sectoral mobility combined with an innovation-oriented mindset.

We aim at creating a DN-Network which will foster:

- Novel and transferable skills and competencies for the selected researchers;
- Enhanced networking and communication among beneficiaries, both in academia and industry;
- Transfer of knowledge between sectors and disciplines;
- Integration of training and research activities between participating organisations;
- Secondments which will promote research training in an associated partner organisation different from the host institution.

We seek to collaborate with at least three "Beneficiaries" ("partners" in other Horizon Europe collaborative grants) i.e., independent legal entities, each established in a different EU Member State/Horizon Europe Associated Country and with at least one of them located in an EU Member State. As part of our joint responsibilities will be to recruit, supervise, host and train researchers, and directly receive funds for doing so. In order to be considered a beneficiary, an entity should host at least one doctoral candidate. *Among the interested beneficiaries, those keen on acting as Coordinating institutions, are particularly encouraged to contact us.*

We invite "Associated partners" for the DN-Network, able to provide additional research and transferable skills training and/or secondment opportunities. In order for the doctoral candidates to benefit most from the diversity and inter-disciplinarity of the network, cross-network training activities and secondments to participating organisations other than their primary host, will be pursued.

Moreover, we seek to involve academic and non-academic organisations such as businesses including SMEs, and other socio-economic actors from the EU and beyond, within the framework of the DN. A crucial part in enhancing the career perspectives and employability of researchers in tomorrow's market, is understanding the link between academia and relevant non-academic sectors, and being exposed to various working and research environments.

At the UM, we bring new thinking to digital economy. New ecosystems and specialized consulting services for FinTech companies will shape the new landscape with start-ups and established firms making a leap of bridging inconsistencies in market practices. We intend to bridge the gap between academia, industry, public and governmental organisations by working in an interdisciplinary way. Almost all faculties collaborate with the Centre for Distributed Ledger Technologies (DLT), the Bank of Malta as well as other public and private organizations.

We are in the early stages of the largest revolution since the emergence of the Internet. Emerging technologies are transforming financial and business services on a global scale. The innovations of Blockchain, cryptocurrencies, cloud technologies, big data analytics, artificial intelligence, Internet of Things, machine learning, nonlinear complex systems, are disrupting

the business and financial services sector and enabling new business models. Globally, more than $100 billion of investments have been made into FinTech companies and Artificial Intelligence (AI) since 2010, and continue growing exponentially. Our goal is to efficiently address the proliferation in AI models within the industry for decision-making. For example, we aim at developing novel approaches in the FinTech domain, for complex business processes, automated markets, prediction and early warning systems. We will focus on developing new algorithms for machine learning, cryptography, AI-based smart contracts on DLT platforms not limited to Ethereum (new para- and cross-chain protocols), new programming tools for solidity incorporating machine learning, artificial intelligence and big data, and on incorporating methodologies from complexity science, operations research, chaotic/nonlinear dynamical systems and statistics.

On the one side, we have tech-savy start-ups who are leading the disruption in the industry whilst on the other hand, the established players (e.g., banks) are still recruiting graduates with traditional skills. The UM must bring new thinking to digital economy. New ecosystems and specialized consulting services will shape the new landscape with start-ups and established firms making a leap of bridging inconsistencies in market practices. The fact that Blochchain and other Future technologies are so multidisciplinary makes them an even stronger case for UM perspective students. Blockchain-related companies and FinTechs are recruiting top managers, economists, financial analysts, marketing scientists, engineers, statisticians, programmers, and business-minded individuals to reshape all business sectors. Hence, many students will decide whether they are looking to join traditional companies or take a calculated risk and join an early-ish stage, high-growth and high-impact start-up. Machine learning, artificial intelligence, big data and Blockchain trend is increasingly apparent among MSc or even PhD graduates, whereby students seem to be increasingly less interested in traditional routes and more drawn to innovation. Blockchain and FinTech by nature, is a multidisciplinary field. Faculties in the University have the potential to become leaders in Blockchain space due to their strengths. The University of Malta has highly ranked programs in most Faculties. Synergy across the faculties and departments will make this possible.

Via education awareness as the first priority for MSCA DN students, the UM must provide the big-picture view and understanding of Future technologies. That is why bringing awareness of the tech-driven innovations in novel business services is number one priority. The next goal is to connect PhD and post-doc with opportunities and careers (internships, part-time, full-time) at leading Blockchain-based companies that are transforming the way economic services in all sectors treated by all departments, are created and delivered. Innovation will be the long-term goal. Entrepreneurship based on novel technologies in all disciplines, will turn the University into a hub for innovation by providing students with the resources necessary to bring innovative products to the market.

New educational plans and goals should be set, through the organization of such events as conferences, invitation of world renowned guest speakers, educational workshops, Blogs, and mentoring meet-ups. Moreover, on the career development side, we want our students to be in

front of the companies leading disruption and transformation in the emerging business landscape. Thus, DN will organize i) On Campus Events, aiming at enhancing recruitment and networking as well as workshops and customized business challenges. ii) Off Campus Events, including Job postings in various channels and mailing lists, company excursions/treks and sponsored projects by the industry. In order to accomplish new goals, the UM must team up with governmental organizations, institutes and companies that support entrepreneurship and innovation, namely with beneficiaries interested to form a novel MSCA-DN network.

The DN, beyond its scientific aims, will be involved in an intensive training program of transferable skills for doctoral candidates. This will include workshops on scientific writing and proposal writing, IPR management, entrepreneurship and exploitation of research results, communication skills and personal development, ethics, team skills, multicultural awareness, gender issues, research integrity, etc. Via the proposed training, we will further contribute to the career perspectives and employability of the candidates.

We intend to explore exponential FUTURE TECHNOLOGIES that cause rapidly accelerating global scientific and societal changes in the future. The common multi - and trans-disciplinary basis is Blockchain architectures in combination with IoT, 5G, AI and ML. The scope entails integrated knowledge between academia, policy makers and market stakeholders. We are committed to deliver a consistent track record of publications in international journals and submitting successful research grant applications. In addition, the MSCA-DN group members will regularly disseminate their research via seminars, workshops and international conferences. They shall actively seek joint activities with other international Universities, research centres, private and public companies and institutions.

The mission of the MSCA-DN network will be to:

❑ Explore the opportunities and externalities associated with the rapid growth of novel technological innovation for the wider economy and society in FinTech.
❑ Contribute to debates about current issues in Digital Economy under the spectrum of a wide range of multidisciplinary research.
❑ Inform stakeholders, such as financial institutions, corporations and government about the advances in digital economics research.
❑ Eventually, explore novel Future Technological applications across multiple fields of the MSCA-DN network.

The multidisciplinary research conducted in digital economy, Artificial Intelligence, Machine Learning and Blockchain technologies can make a difference to communities, advance existing theories, and inform policy-makers and regulators. The research in digital ecosystems will benefit the European Union as a society as a whole and will lead to financial, social and environmental sustainability.

Through new developments in smart contracts, cloud storage, 5G, machine learning, IoT, artificial intelligence, nonlinear complex systems, the MSCA-DN Action will explore applications in various sectors such as:

– Banking and Investment management
– Medical data management and Genomics
– Music royalties tracking
– Cross-border payments
– Real-time IoT operating systems
– Anti-fraud banking systems
– Supply chain and logistics
– Taxation and auditing
– E-Voting security mechanisms
– Advertising and Marketing
– Urban commute services
– Hotel management
– Loyalties
– iGambling
– Cryptocurrencies
– Arts auctioneering
– Legal services
– Asset value appraisal
– Big Pharma supply chains
– Real estate
– Agricultural farm management
– Energy supply systems
– Resilient renewable sources
– Asset Management
– Insurance Claim processing
– Smart Appliances
– Healthcare management systems
– E-Governance
– Personal Identification

Further Research Project Details:

<u>Involved Research Fields:</u> Economic & Social Sciences, Mathematics, Physics, Environmental Sciences, Information Technology, Data Sciences (Artificial Intelligence, Machine Learning), Economics, Physics, Statistics/Mathematics, Engineering (all disciplines), Operations Research, Behavioral & Cognitive Sciences, Psychology, Media and Knowledge Sciences, Medicine, Biology.

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Deadline: Friday, 24th September 2021

<u>MSCA-DN candidate profile:</u>

We are interested in graduates from Management, Environmental Sciences, Information Technology, Data Sciences (Artificial Intelligence, Machine Learning), Economics, Physics, Statistics/Mathematics, Engineering (all disciplines), Operations Research, Laws, Media & Knowledge Sciences, Behavioral & Cognitive Sciences, Psychology etc. We strongly emphasize multidisciplinary, interdisciplinary and trans-disciplinary research. Candidates should possess quantitative and computing skills.

Researchers supported by the MSCA DN cannot already hold a PhD degree, however, they must be enrolled in a doctoral program in at least one EU Member State/Horizon Europe Associated Country. In addition, they are required to comply with the mobility rule, according to which they must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date. All the beneficiaries must recruit and host at least one doctoral candidate. The project duration is limited to 48 months from the start date of the action set out in the Grant Agreement. The recruitment of each doctoral candidate will be supported for a minimum of 3 months and up to a maximum of 36 months. Synergy and cooperation between doctoral candidates is highly pursued among all beneficiaries.