

Position Description

1. General Information

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| Name of the position | Enhancing human-machine interaction (HMI) in designing transformative innovations for human health |
| Foreseen enrolment date | September 2025 |
| Position is funded by | <ul style="list-style-type: none"> • COFUND, Marie Skłodowska-Curie Actions (MSCA), Horizon Europe, European Union • Kaunas University of Technology (KTU) • RMIT University |
| Research Host | Kaunas University of Technology (KTU) |
| PhD awarding institutions | Kaunas University of Technology (KTU) & RMIT University |
| Locations | Primary: Kaunas, Lithuania Secondary: Melbourne, Australia |
| Salary | 36,336 EUR annual gross salary (incl. paid vacation) (3,028 monthly gross salary) |
| Supervisors | <ul style="list-style-type: none"> • Asta Pundziene, Professor, KTU • Max von Zedtwitz, Professor, KTU • Vytaute Dlugoborskyte, Associate Professor, KTU • Gillian Vesty, Professor, RMIT University • RMIT Associated Supervisor TBC |
| Group of discipline | Management, Psychology (Neuroscience), Artificial Intelligence |

2. Research topics (only one of these projects will be funded)

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| Project 1: <i>Enhancing Human – machine interaction in designing transformative innovation for human health</i> |
| <p>Advancing the intersection of AI, human-machine interaction (HMIx), and cybernetics holds transformative potential for biotech innovation. This thesis will explore how AI-powered systems can integrate with HMIx to create adaptive, real-time feedback loops in cybernetic devices, enabling breakthroughs in personalized medicine, neural interfaces and drug discovery pipelines. By addressing challenges like data integration, real-time processing, and biocompatibility, and leveraging advancements in multimodal AI models and biocompatible materials, the research aims to bridge the gap between biological variability and machine precision. The ultimate goal is to pioneer systems that not only enhance human health and functionality but also redefine the boundaries of human-machine collaboration in biotechnology for sustainable and resilient futures.</p> |
| Supervisors: Asta Pundziene (KTU), Vytaute Dlugoborskyte (KTU), Gillian Vesty (RMIT) |



Research Fields: Artificial Intelligence, Human-Machine Interaction, Innovation

Project 2: *Managing fuzzy front-end innovation at the intersection of AI and human - machine interaction*

The intersection of artificial intelligence (AI), human-machine interaction (HMIx), and cybernetics represents a fertile area for innovation, particularly in the biotechnology sector. This research focuses on the fuzzy front end (FFE) of innovation—the early, exploratory stages where uncertainty, creativity, and discovery converge—to examine how emerging technologies can reshape biotech advancements.

The study will investigate how AI-powered systems can be integrated with HMIx to develop adaptive, real-time feedback loops in cybernetic devices. These loops hold the potential to transform personalized medicine, neural interfaces, and drug discovery pipelines by addressing critical uncertainties that arise during the ideation and initial development phases of biotech solutions. By focusing on the FFE, this research seeks to uncover innovative pathways that bridge biological complexity and machine precision in order to ensure more reliable and sustainable futures for human end environmental health. The anticipated outcomes include pioneering systems that enhance human health and functionality while redefining the boundaries of human-machine collaboration. By addressing FFE challenges, the research aims to accelerate breakthroughs in personalized medicine, neural interfaces, and drug discovery pipelines, ensuring sustainable and resilient futures for biotechnology.

This exploration into FFE innovation in biotech seeks to provide actionable frameworks and prototypes that can inspire new directions for research, development, and implementation in this transformative field.

Supervisors: Max von Zedtwitz (KTU), Vytaute Dlugoborskyte (KTU), Gillian Vesty (RMIT)

Research Fields: Artificial Intelligence, Human-Machine Interaction, Innovation

Project 3: *Pioneering AI powered Systems for precision medicine discovery for sustainable and resilient futures*

Precision medicine significantly contributes to a sustainable and resilient future by optimizing healthcare efficiency and minimizing resource wastage. By tailoring treatments to individual characteristics, it reduces the trial-and-error approach in medical care, conserving resources such as medications and diagnostic tools while lowering costs and environmental impact. Precision approaches streamline drug development by targeting therapies with higher success probabilities, reducing the ecological footprint of pharmaceutical research and clinical trials. Furthermore, personalized treatments minimize adverse effects, decreasing the need for additional interventions and associated waste. In addition, precision medicine enhances resilience by enabling faster, targeted responses to public health crises, improving preventative care, and managing chronic and age-related diseases more effectively. The convergence of artificial intelligence (AI), advanced human-machine interaction (HMIx), and cybernetics presents transformative opportunities to revolutionize precision medicine. This research focuses on developing AI-powered systems to address the critical challenges in the discovery and development of precision medicine, where tailoring treatments to individual patients requires the integration of vast, complex, and variable biological data. This study will explore how AI-driven systems, when integrated with adaptive HMIx and cybernetic frameworks, can accelerate breakthroughs in precision medicine discovery. By leveraging real-time data analysis, multimodal AI models, and advanced feedback mechanisms, this research aims to enhance the accuracy, efficiency, and scalability of precision therapies. In particular, research aims at design adaptive HMIx systems that facilitate seamless collaboration between researchers, clinicians, and AI-powered tools, Incorporate real-time feedback loops to enable iterative improvements in therapeutic design and validation and addressing biotechnological challenges, such as data integration, real-time processing of high-dimensional data, and aligning AI outputs with clinical relevance. The proposed research aspires to pioneer a new generation of AI-powered systems that bridge the gap between biological complexity



and technological precision that will allow to establish scalable, sustainable, and patient-centric innovations that will drive the future of healthcare and biomedical research.

Supervisors: Max von Zedtwitz (KTU), Vytaute Dlugoborskyte (KTU), Gillian Vesty (RMIT)

Research Fields: Artificial Intelligence, Sustainability, Innovation

3. Employment Benefits and Conditions

Kaunas University of Technology (KTU) offers a 48-month full time work contract. The total working hours per week are 40.

The remuneration, in line with the European Commission rules for Marie Skłodowska-Curie grant holders, will consist of a **gross annual salary** of yearly 36,336 EUR per year (which is of monthly 3,028 EUR). Of this amount, the **estimated net salary** to be perceived by the Researcher is 1,832 EUR per month. However, the definite amount to be received by the Researcher is subject to national tax legislation.

Benefits include:

- Becoming a Marie Skłodowska-Curie fellow and be invited to join the Marie Curie Alumni Association
- Access to all the necessary facilities at KTU and RMIT University
- Tuition fees exemption at both PhD awarding institutions
- Travel allowance to cover flights and accommodation for participating in DREAM+PLAN events
- Up to 12 months in Australia
- 20 days paid holiday leave
- Social security coverage
- Sick leave
- Parental leave.

4. PhD enrolment

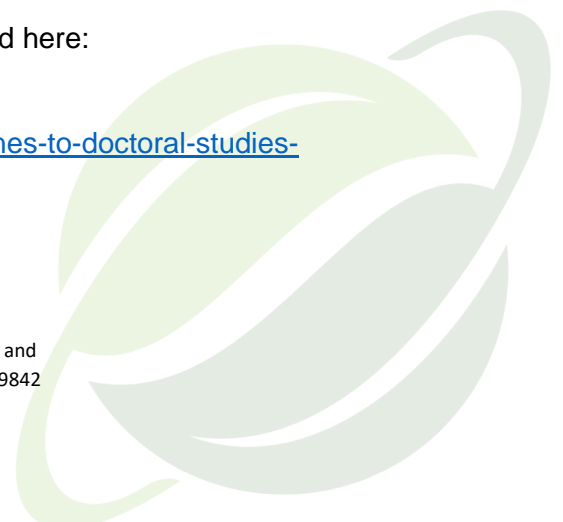
Successful candidates for this position will be enrolled by the following institutions and must comply with their specific entry requirements, in addition to DREAM+PLAN's conditions.

Kaunas University of Technology (KTU)

To enrol in a Doctorate program you must meet the general conditions, namely:

- The requirements for enrolling in a doctoral program are listed here:
<https://admissions.ktu.edu/phd/#application-for-the-admission>

More information: <https://admissions.ktu.edu/phd/#dates-and-deadlines-to-doctoral-studies-coordinated-by-the-KTU>





RMIT University

Visit the website: <https://www.rmit.edu.au/research/research-degrees/how-to-apply>



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