Funded by the European Union

NATURE4NATURE

Doctoral Candidate (DC3): Towards a symbiotic toolset for bioinspiration

Host Institution: Technische Hochschule Deggendorf, Germany
Secondments: Functional Morphology Group, University of Antwerp, Belgium (UA; 4 months)
BiomimicryNL, The Netherlands (4 months)

About Nature4Nature

Bioinspiration (including biomimetics and biomimicry) develops novel materials, devices, and applications inspired by biological structures and strategies. However, the main obstacle preventing this field from achieving its goals derives from differences in tools, practices and viewpoints of its practitioners. The EU-funded Nature4Nature project brings biologists, engineers, designers and manufacturers together to deliver early-stage researchers (ESRs) teaching in a learning environment that connects the inspiration, integration and implementation aspects of the bioinspiration process to undertake the conceptual, methodological and practical challenges. To do so, the project will collectively focus on biological filtration mechanisms to explore, test and design high-throughput, clog-resisting filtration systems, which could ultimately alleviate the current problems facing aquatic environments.

Technische Hochschule Deggendorf

The Deggendorf Institute of Technology (DIT) was founded in 1997 and is a University of Applied Sciences. The working group biomimetics was founded in 2009 and Prof. Wanieck is leading the research on the theory of biomimetics as a robust methodology for product development and innovation since the beginning.

Project description

We work toward the optimization of the biomimetic development process which can be facilitated by tools and methods. In this context we identified the potential to optimize tool-based methods and to broaden their objectives by including biological knowledge and by addressing environmental sustainability. Novel, more biologically informed tools for bioinspiration, with their performance assessed and compared to that of current tool-based methods are to be developed.

You will (1) conduct a theoretical and empirical analysis of existing tools to identify their principal characteristics, theoretical background, objectives, advantages, and drawbacks. (2) You will develop means to link these existing tool-based methods and biological knowledge by integrating biological and evolutionary concepts and processes in the context of filtration systems. (3) You will investigate how tool-based methods can be further developed to increase the impact of bioinspiration on sustainable innovation.

During the 3 years program, you will spend 4 months at the University of Antwerpen, examining the relevant concepts and terminology in (evolutionary) biology. You will map biological and technological functions and analogies. The aim is to develop a biology-to-engineering thesaurus for mapping functions. The research will include the importance of evolutionary constraints in the abstraction of biological functions for biologically inspired design. Additionally, you will spend 4 months with BiomimicryNL where you will learn how to integrate sustainability principles in tool-based methods for bioinspiration. You will work specifically with the theoretic framework of Life's Principles as developed by Biomimicry 3.8. And you will do a case study analysis of projects and results developed by BiomimicryNL.

Profile & requirements

- Applicants must hold a master's degree or equivalent in the fields of Biology, Biomimetics, Innovation management or comparable fields from Engineering or natural sciences
- Expertise and research interest in biomimetics and biomimetics-relevant scientific issues
- Computational skills (preferred but not mandatory)
- Transcripts of the master's degree must be available by the date of the recruitment
- Applicants should have a strong affinity for research
- Applicants may be of any nationality but must comply with the Horizon Europe MSCA eligibility criteria*
- Applicants must be able to understand and express themselves in both written and spoken English to a level that is sufficient for the completion of a PhD

- All qualified applicants, including minorities and woman, are encouraged to apply

* *HORIZON MSCA Mobility Rule*: Applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organization (Germany) for more than 12 months in the past 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status are not taken into account.

* *HORIZON MSCA eligibility criteria*: Applicants may not hold a doctoral degree or equivalent at the start date of the recruitment. Researchers who have successfully defended their doctoral thesis but who have not yet formally been awarded the doctoral degree will not be considered eligible.

Benefits

- The selected candidate will be employed by the host organisation for **36 months**
- **The start date will be as of September 1st, 2023**
- The opportunity to be part of an MSCA Doctoral Network: the selected candidate will benefit from the designed training programme offered by the host organisation and the Nature4Nature consortium.
- The selected candidate will participate in international secondments to other organisations within the Nature4Nature network.
- Doctoral candidates are offered a competitive remuneration based on the MSCA allowances in line with the MSCA WP 2021-2022. The gross monthly amount at THD is based on the Collective agreement for the public sector (TV-L) (see https://oeffentlicher-dienst.info/c/t/rechner/tv-l/west?id=tv-l-2023&matrix=1 for more information).
- Costs associated with the network and training events are to be covered by the host institution.

Application

- Interested candidates are invited to apply for this position: https://bmgmt.th-deg.de/apply.php?site=apply_job_offer_show&job_offer=1850
- The closing date for applications is **January 31st, 2023**.
- The selection committee will review all the applications upon the application deadline.
- The recruitment process of Nature4Nature is in line with the principles set out in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.
- Ukrainian researchers are eligible to benefit from the Science4Refugees initiative without the need of holding the refugee status.

Additional information

- For more information on the Nature4Nature consortium, please visit our website at https://www.nature4nature.net/
- Any additional questions can be directed to the project manager, Genevieve Diedericks, at Genevieve.Diedericks@uantwerpen.be

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