



Doctoral Candidate (DC8): Design for Nature: using bioinspired design to support society towards more sustainability

Host Institution: University of Antwerp, Belgium

Secondments: Impactvista, Belgium (5 months)

BiomimicryNL, The Netherlands (5 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.

University of Antwerp

The University of Antwerp (UA) is the third highest ranked university in Belgium in terms of Excellence and has been awarded the HR Excellence in Research Award by the EU. UA has an excellent track record as to the participation in EU framework research and innovation programmes. Up until 25 October 2021, UA has signed 182 Horizon 2020 grants, incl. 47 MSCA Individual Fellowships, 27 MSCA Innovative Training Networks (of which 7 as coordinator) and 4 MSCA RISE projects. For the proposed Doctoral Network the efforts of two leading research groups are combined: the Laboratory of Functional Morphology (UA-FM) and Product Development Research Group (UA-PD).

UA-PD seeks to enhance scientific knowledge that empowers the creation of innovative products to improve human well-being. Two research lines are supported in this project; firstly, the Circular Design lab (Prof. Els Du Bois) is interested in supporting the transition of the plastics industry towards a circular economy from a human-centred perspective and secondly the Antwerp Design Factory (Prof. Regan Watts) is an interdisciplinary lab interested in agile prototyping and shares facilities and design expertise order to productise research output and prepare for valorisation.

DC8 will be hosted by the UA-PD.

Project description

The aim of this PhD trajectory is to make the link between the Nature4Nature project and the society. Many people have a growing awareness and understanding of their environmental impact and those of our consumption society. They are willing to change their activities and behaviour in order to reduce their impact. Taking Nature4Nature literally, in this PhD project, we aim to translate biological insights into something that is useful to help people in regenerating nature. Understanding is needed in how new designed products should be developed to empower people to (i) grasp and visualise their impact, and (ii) enable positive behaviour.

From a people perspective, products can be bio-inspired from both an aesthetic (looking natural) and a functional perspective (technological inspiration). Both can be used to increase sustainable behaviour and awareness, nevertheless, more insights are needed. The project aims to detail insights in design ethics on how understandings from nature should only be used to help nature and how greenwashing should be avoided.

Linking with the whole consortium, we focus within the research on the development of a specific product to catch synthetic microfibers that are release when clothes are washed. The development of this product should make people aware of the amount of fibres that are released but also enable them to execute correct behaviour to reduce their impact. i.e. by enabling to catch the fibres in a non-cloggeable filter that can easily be cleaned, with proper disposal of the fibres.

Detailed understanding of the PhD project:

- Research cycle 1: understanding people's vision on bioinspiration. Research questions: What are the public and industry perceptions of bioinspiration? How do people individually perceive bio-inspired products?
- Research cycle 2: understanding people's needs to reduce their impact. Research questions: what do people need in order to act more sustainable? What support do they want to behave more sustainable?
- Research Cycle 3: understanding design ethics. Research questions: How can design ethically treat bio-inspired knowledge? How to avoid greenwashing or negative design applications of bio-inspiration? What are the sustainability standards and goals with relevance to bioinspired applications? What is missing and how can the design ethics be implemented?
- Research cycle 4: understanding successful bio-inspired design solutions. Research questions How to design for biomorphism (nature's shapes and forms)? How to design biophilic products (allow people to reconnect with nature)? How to design using biomimicry (nature insights on innovation, both tech and systemic)?

In addition, as this PhD project is part of the larger MSCA doctoral network Nature4Nature, in addition with eight other doctoral researchers, you will be trained and challenged to understand bio-inspiration from the fields of biology, engineering and design innovation in order to be inspired by nature, integrate and implement bio inspired innovation. You will be working towards a doctorate from the University of Antwerp. Within the University of Antwerp, you will be connected to the REUseLab at the research group of Product Development. This group aims to understand the successful implementation of reusable and long living products as alternatives for the ubiquitous single-use products. In addition, you will have two secondments with industrial partners BiomimicryNL (Year 1, 5 months) and Impactvista (Year 2, 5 months).

Profile & requirements

- Applicants must hold a master's degree or equivalent in the field of Industrial design engineering, Behaviour design, product development or comparable fields from engineering or social sciences
- Interest in biomimicry, bioinspiration and sustainability are indispensable
- Transcripts of the master's degree must be available by the date of the recruitment
- Applicants should have a strong affinity for research
- Expertise with social science research methods is considered as a plus
- 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 (Belgium) 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.
- Benefit from the comprehensive doctoral programme at the Faculty of Design Sciences at the University of Antwerp.
- 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 UAntwerpen corresponds to the amount for doctoral scholarship holders. Moreover, funding is available for technical and personal skills training and participation in international research events.

Application

- Interested candidates are invited to apply for this position: <https://www.uantwerpen.be/en/jobs/vacancies/academic-staff/>
- 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

