

EWUU Alliance Call for projects

AI for Preventive Health and a Circular Society

Submission deadline 15 February 2023

Terms and Conditions

version 2022-12-13

1. Introduction and aim of the AI for Preventive Health and Circularity call

Eindhoven University of Technology, Wageningen University & Research, Utrecht University and University Medical Center Utrecht entered a strategic alliance (EWUU Alliance) in 2019 with the aim of working intensively together on two main themes: Health and Circular Society.

This call is organised by the following three working groups of the Alliance: institute 4 Preventive Health, Circular Society and Artificial Intelligence for Health.

The purpose of this call is to financially support cross disciplinary collaborations between the four EWUU Alliance institutions that are geared towards large initiatives where Artificial Intelligence plays a crucial role in advancing the state-of-the art in Preventive Health and Circularity.

Trustworthy AI for Preventive Health and Circular Society

With this call we aim to stimulate ideas for research projects from within the Alliance TU/e, WUR, UU and UMCU that will contribute to the innovative development and application of trustworthy AI in the two societal impact domains "Preventive Health" and "Circular Society".

Data Science and AI are key enablers for scientific discovery and revolutionize the way we do science. However, an intrinsic challenge of working with AI methods is misuse, concerns with validity, accuracy, transportability, and other unwanted effects such as difficulties with explainability and transparency. In this call, we welcome projects that:

1. Change the state of the art in issues of preventive health or circularity through the application or development of trustworthy AI;
2. Innovate in the development and application of trustworthy AI methods applied in preventive health and circularity, such as, but not limited to:
 - Data science and statistical methods that detect and remove bias in algorithmic decision-making.
 - Methods to deal with complex data (heterogeneous, multi modal) to be able to perform predictive modeling, digital twinning.
 - Data preparation methods to improve the quality of data (data curation, knowledge graphs, multiple imputation).
 - Learning from data beyond traditional pattern recognition to identify predictive models, such as probabilistic machine learning, model-based machine learning.
 - Causal machine learning.
 - Using AI to make algorithms explainable and transparent.
 - Involving ethical and legal frameworks in algorithmic decision-making.

- Human-centered AI: understand how algorithms affect humans and how they are used in society to develop better algorithms.
- AI for sustainability: use algorithms to better understand and design sustainable real-world systems.

The proposals should focus on the innovative use of AI methods listed above AND tapping into at least one of the following themes/research lines of the institute 4 Preventive Health or Circular Society:

Institute 4 Preventive Health research themes

Optimal physical, social and mental functioning and self-efficacy is important to live healthy and productive lives. This reflects all stages of life: e.g., reaching independence is a key target in adolescence, and maintaining self-efficacy is the prime goal of the elderly population. Within i4PH we want to understand how lifestyle and environmental factors influence the independent functioning of individuals, and what the role of their biological and social systems is. How can these factors influence resilience, and how can we improve self-efficacy of individuals and societies through lifestyle, environmental, societal, medical and technological support and innovations? I4PH wants to work on system changes where solutions from the different domains (environmental and curative health, nutrition and innovative technology) are combined to support the sustained transformative change towards independent functioning and sustained self-efficacy in different phases of life.

For more information on the institute 4 preventive health, please visit www.preventivehealth.ewuu.nl

1. HEALTHY START

Research targeting youth (<20) facing economic, educational disadvantages and societal challenges, increasing our understanding of the factors that shape youth development, that explain why some successfully navigate transitions, and adapt to setbacks and adversity, and others do not and factors increasing the odds of favourable developmental outcomes.

2. PRESERVING HEALTH

Research targeting persons facing economic, educational disadvantages and societal challenges, aimed at increasing our knowledge in support of preventive interventions aimed at reducing health inequalities and the burden of disease.

3. HEALTH@ HOME

Research in support of providing preventive health services in the own living environment of people, instead of in healthcare settings and supporting healthy living.

4. LIVING WITH DISEASE

Research aimed at increasing our knowledge and developing precise interventions that support the quality of life, participation in society of patients of all ages living with (chronic) disease and/or disabilities.

Circular Society research themes: two focus areas

The gathering, processing and interpretation of (digital) data is an important element in assessing, designing and evaluating the circularity of real-world systems, and in determining impacts on the environment and human beings. Digital twinning, AI and serious gaming can be important technologies or tools in such circular design. We are interested in proposals that contribute to one or both of our focus areas: Circular Safe Hospitals and Urban-Rural Balancing.

Focus area Circular Safe Hospitals (CSH)

The healthcare sector is one of the most carbon-intensive sectors, contributing to 7% of emissions in the Netherlands and responsible for 13% of the national footprint of material extraction. This makes it a major contributor to climate change, biodiversity loss and pollution of water, air and land, negatively impacting human health and wellbeing. CSH aims to develop and implement scalable systemic transdisciplinary circular (and safe) strategies. Such solutions should minimize ecological footprints and negative effects on global health.

Within CSH, we identify three research lines:

1. Circular strategies for medical devices and procedures:

Hospitals need to move away from their “take-make-waste” culture with regards to medical procedures, devices and single-use products and become torchbearers for sustainable supply chains instead.

2. Medication without harm - preventing waste and pollution

One potential improvement is the reuse of prescribed and distributed, yet unused medication, which would reduce waste of resources used for production, packaging and transport. Another issue addressed is that after usage, medication residues can pollute surface and ground water, having a major negative impact on the environment and eventually on human health.

3. Future proof patient diets - balancing nutrition and circularity

In this research line we investigate nutritious food with a minimal ecological footprint from farm to fork and develop strategies and scalable solutions for hospitals to offer a healthy diet within the planetary boundaries.

Focus area Urban-Rural Balancing (URBALANCE)

Urbanisation worldwide is still increasing, putting existing ecosystems under further stress. Urban systems are concentration points of consumption of resources and energy and production of waste, with a lack of space to provide ecosystem services. Rural systems are characterised by a higher availability of natural resources, offering space and ways for the production of food, water and energy, to be supplied largely to the urban systems, and with a high potential for providing eco-system services. Approaches such as material and energy flow analysis, urban/rural metabolism, or demand/supply chain assessments, can contribute to redesigning more balanced urban-rural systems. In URBALANCE, will focus on urban-rural spatial transition zones, where socio-economic knowledge, natural sciences and technical, legal, and spatial planning and design perspectives can be brought together in scalable pilot research and implementation projects.

Within URBALANCE, we identify two overarching themes:

1. Resolving the economic, legal and socio-cultural barriers among and between urban and rural citizens and organisations enabling circularity as well as equity.
2. Nature based solutions as driver for circular urban systems in balance with rural environments

Specific challenges we identify are the nutrient challenge, the green landscape & water challenge, the sustainable energy & materials challenge, and the Global South challenge (what can we learn from for example low-tech solutions used elsewhere & the other way around).

2. Conditions for applicants

Type of projects

The seed fund grants can be used for activities to support preparing a larger grant application related to the development of artificial intelligence in the two societal impact domains, preventive health and circular society, in the near future (e.g., Horizon Europe, Digital Europe, NL AIC calls, NWA, NWO, ZonMW, charitable funds ("collectebusfondsen")), including but not limited to:

- Consortia building and grant writing support (both internal and external support)
- Conducting necessary preliminary research (e.g., developing a prototype) to successfully apply for a larger grant later.

Who can apply?

1. At least 3, but preferably 4 partners within the Alliance are involved in the proposal. Given sufficient quality, higher priority will be given to proposals in which all 4 partners within the Alliance are involved.
2. The main applicants are tenured or tenure-track researchers (assistant professor, associate professor, professor) at the institutes of the Alliance.
3. Researchers can be Applicant in a maximum of one Project Idea in response to this Call for Proposals
4. Excluded as main applicants for this call are: 1) applicants who already received a grant from the EWUU in 2022 as main applicant; 2) members of the working groups AI for Health, Preventive Health and Circular Society.
5. The allocated grant amount must be expended by 31 December 2023.
6. Proposals that do not meet these requirements will not be considered for funding.

What amount can be requested?

The maximum amount that can be requested per application is €40K. The total foreseen budget is 240K. Note that during the evaluation, the reviewing committee reserves the right to decide on the proportion of this budget to be awarded and can adjust proposed budgets if deemed reasonable, also to be able to fund additional proposals.

What can the funds be used for?

The seed fund grants should be used for activities to support preparing a larger grant including but not limited to:

- Salary of faculty staff, postdoc and student assistants.
- Fees for staff or organisations who support grant writing.
- Travel directly associated with the proposed activity (for example, travel to match-making events related to grant application).

The seed fund **cannot** be used for:

- Matching in a grant application.
- Financing the extension of the PhD contract
- The purchase of software, hardware or other devices unless such items are crucial to the execution of the research project and cannot be obtained through the regular support services of the institution where the researcher has been appointed.
- Attending courses or conferences not related to the research project.

Requirements for awardees

Awardees must be willing to attend future Alliance events and present their results there. By the project end date (9 months after receipt of the seed money), recipients must provide a final report of the research results including a financial account and a summary of the deliverables.

3. Assessment procedure

Procedure

A reviewing team consisting of members of the steering committees of the three working groups will perform the scientific review of the proposals. If necessary, they may ask experts outside the working group to review the research proposals. Steering committee members who have a conflict of interest (for example, because of the involvement of direct colleagues in a proposal) are exempt from decision-making. The applicants will be informed of the decision on 10 March 2023 at the latest.

Funding will be dispersed by the finance team directly following the notification to the applicants. If ethical approval is needed for a project, the amount can only be transferred after the applicants have handed over the approval of the Ethics Committee to the liaison officer of their institution. After this approval, the amount will be transferred, and the project can start (no later than 15 April 2023).

Criteria

The applications submitted will be assessed based on the following criteria:

1. The quality and composition of the research team (30%)
 - The extent to which the research team makes effective use of the complementary expertise of the different Alliance partners to form new collaborations and innovate.
 - The proportionate contribution of the involved alliance partners in the work being done.

Given sufficient quality, higher priority will be given to proposals in which all 4 partners within the Alliance are involved.
2. Contribution of the research to the challenges in AI in preventive health or circular society, defined in section 1 (35%).

- Fit to at least one of the Themes/Research Lines of application domains Preventive Health or Circular Society. In the case of application of AI methods in Preventive Health – focus on primary and/or secondary and/or tertiary prevention, adopting personalised, predictive, participatory and potential health approaches.
 - How the proposed AI solution advances the state-of-the art in preventive health or circular society.
 - The extent to which the project contributes to innovative development and application of AI in preventive health or circular society.
3. Scientific quality and feasibility (35%)
- Quality of the problem analysis and the proposed solution.
 - Methodological quality of the proposed AI solution.
 - Innovativeness and creativity of the proposed project, balanced by the project's likelihood of success.
 - The extent to which the objectives are achievable with clear deliverables and realistic within the given timeline and budget.
 - Originality of the proposed Project Idea.
 - The extent to which the proposal adheres to the values of safety, privacy, security, trust, fairness, explainability, human-centered, Open Science, and legal aspects such as GDPR, AI Act.
 - If applicable, the feasibility of obtaining the approval of an Ethics Review Board by 15 April 2023.

Submission guidelines

Applications can be submitted (using the enclosed application form and the budget form) to the liaison officer of your institute (see e-mail addresses below, under 'Contact'). The deadline of the submission is **15 February 2023 at 18:00hrs**. The applicants will be informed about the result of their applications on **10 March 2023** latest. Applications that do not meet the minimum requirements (eligibility criteria and submission requirements) will not be considered.

4. Contact and other information

Contact

For questions about this call, please contact the liaison officer of your Institute:

- TU/e: Dasha Alexeeva (D.V.Alexeeva@tue.nl)
- WUR: Ben Schaap (Ben.Schaap@wur.nl)
- UU: Laurence Frank (L.E.Frank@uu.nl)
- UMC Utrecht: Annelotte Vonk (A.M.Vonk-3@umcutrecht.nl)

Or contact us in our Teams environment: join our team with [this link](#).

Organisation

Information about the three working groups who are organizing this call and the persons involved, can be found on the following websites:

Institute 4 Preventive Health: <https://preventivehealth.ewuu.nl/>

Circular Society: <https://ewuu.nl/en/research/circular-society/team-circular-safe-society/>

AI for Health: <https://aiforhealth.ewuu.nl/>