Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects
to support Post-Doctoral Researchers

H.F.R.I.
Hellenic Foundation for Research & Innovation

Research Project Title:

Urban Biometeorology and Planning: an integration of field surveys and weather station data for the assessment of thermal perception and related health effects towards sustainable living environments

Principal Investigator:

Katerina Pantavou

Popular Title:

UBiPlan

Scientific Field:

Natural Sciences, Physics, Atmospheric Sciences

Host Institution:

Agricultural University of Athens

H.F.R.I.
Hellenic Foundation for Research & Innovation

Research Project Summary

Within the present global climate change regime along with urbanization, the need for methodologies aiming at the improvement of the quality of life in urban areas is becoming evident. In this context, we propose the development of a new, integrated framework that integrates biometeorological, urban planning and environmental epidemiology data and methods. This project is aimed at the development of an improved methodology to simulate outdoor thermal sensation for large urban areas using weather station data, although considering micrometeorological conditions too. The micrometeorological data of three field surveys on thermal sensation, already conducted at different sites of the wider area of Athens (Greece) will be integrated and enhanced. Additional microclimatic data will be collected from field surveys that will be conducted at selected outdoor public spaces in Athens during the proposed research project. The field surveys will include micrometeorological measurements and questionnaire-based interviews in accordance to the previous three experimental procedures. Spatial interpolation of thermal conditions estimated using data from the weather station network will provide the spatial distribution of the thermal conditions including the monitoring sites which will be adjusted to successfully produce simulations of thermal conditions in the monitoring sites. The thermal conditions will be evaluated using models that simulate thermal perception, namely state-of-the-art thermal indices.

The developed spatial distribution of thermal conditions will be applied in the context of urban design and human health issues. Alternative design scenarios will be examined. Moreover, the potential association between outdoor thermal conditions and mortality will be investigated to estimate micrometeorological risk variations and determine cutoffs of the thermal indices above which increased risk may be observed. Design guidelines and mitigation strategies and control will be evaluated. The proposed methodology can also be applied to different scientific fields and contribute to address economic and social challenges including tourism and energy conservation.

Project Impact on Society

People living in a modern urban environment are subject to a number of potentially harmful factors. Understanding of the way people perceive and interact with their thermal environment is important for improving living conditions and population health.

The project will allow the development of successful, targeted outreach campaigns by local authorities and policy makers, which could protect the population from excessive thermal exposure. It will introduce a reliable and effective method for estimating thermal perception in urban microclimates based on which thermally unfavorable areas will be indicated, increasing the interest in providing well-designed open spaces and environmental quality. A thermally comfortable outdoor environment promoting outdoor living is crucial in mitigating the heat island effect in cities. It can also prevent people from moving to air-conditioned indoor spaces, which further burdens an environment. Increased outdoor presence enhances security and promotes physical activity, which in turn reduces the burden of chronic diseases. Other benefits include the increased use of greener modes of transportation, such as cycling and walking, resulting in further improvement of living conditions and population health by lowering pollutants emissions, reducing energy consumption and inhibiting the heat island phenomenon.

H.F.R.I.
Hellenic Foundation for Research & Innovation

Funding

Amount: **200,000 €**

Duration: **36 months**

Foundation: **H.F.R.I.**

H.F.R.I.
Hellenic Foundation for Research & Innovation

CONTACT

127, Vasilissis Sofias Avenue
115 21 Athens, Greece
info@elidek.gr
www.elidek.gr

HELLENIC REPUBLIC
MINISTRY OF DEVELOPMENT AND INVESTMENTS

GSRT
GENERAL SECRETARIAT FOR RESEARCH AND TECHNOLOGY