



RUDN
university



SMART
URBAN
NATURE

Smart Urban Nature: modelling and evaluation of ecosystem services provided by urban soils and green infrastructure

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Smart Urban Nature Lab (SUN Lab) - Smart technologies for sustainable development of the urban environment in the context of global change

- founded in 2018
- Professor Riccardo Valentini, Peace Noble Prize Laureate as a member of IPCC
- fundamental and applied research in the field of urban ecology and sustainable development of the urban environment

 sunlab.rudn.ru/

 www.facebook.com/SmartUrbanNature

Research areas



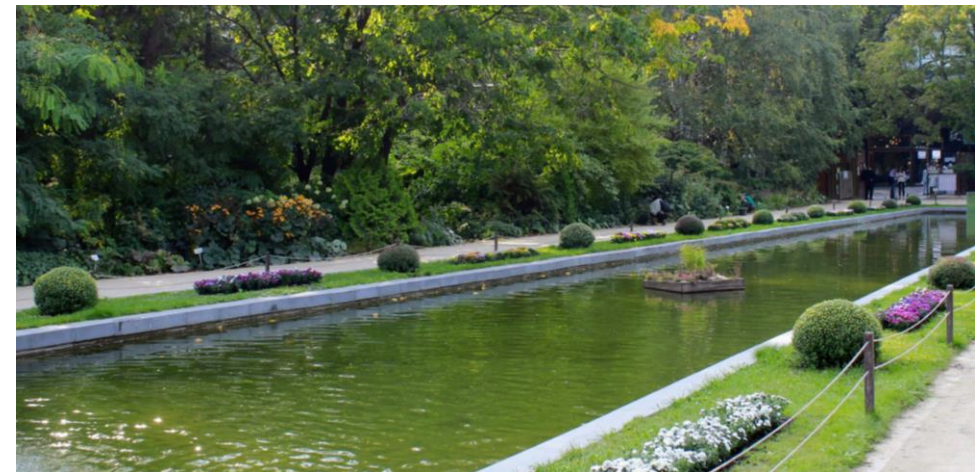
Environmental monitoring of urban green infrastructure



Soil ecological research



Urban climate research



Sustainable development of urban ecosystems

SMART URBAN TREE

provide a comprehensive assessment of tree physiological functioning and vertical stability remotely and in real time.

The technology is based on the **Tree Talker (TT)** – a new device capable of measuring sap flow, spectral characteristics, diametral growth, microclimatic characteristics and oscillation.

At the beginning of 2021

- more than 2000 devices in the world,
- more than 260 in Russia: Moscow, Saint Petersburg, Rostov-on-Don

The monitoring network of 220 devices (8 clusters) created in Moscow is the largest in the world for urban green spaces.



Urban soils and soil constructions

- express methods for assessing the quality and ecological functions of urban soils
- mapping of complex pollution of urban and technogenic soils for the development of remediation projects
- adaptation of approaches of digital soil mapping to the conditions of the urban environment
- analysis of microbial diversity and microbiological activity of urban soils in different climatic zones

Modeling of soil constructions

- creating sustainable soil structures for cities in different bioclimatic zones: Apatity, Moscow, Rostov-on-Don
- assessment of ecosystem services of urban soils and lawns
- methodology for assessing the state of soil structures

It is necessary to optimize the processes of urban planning and improvement in different regions of the country.

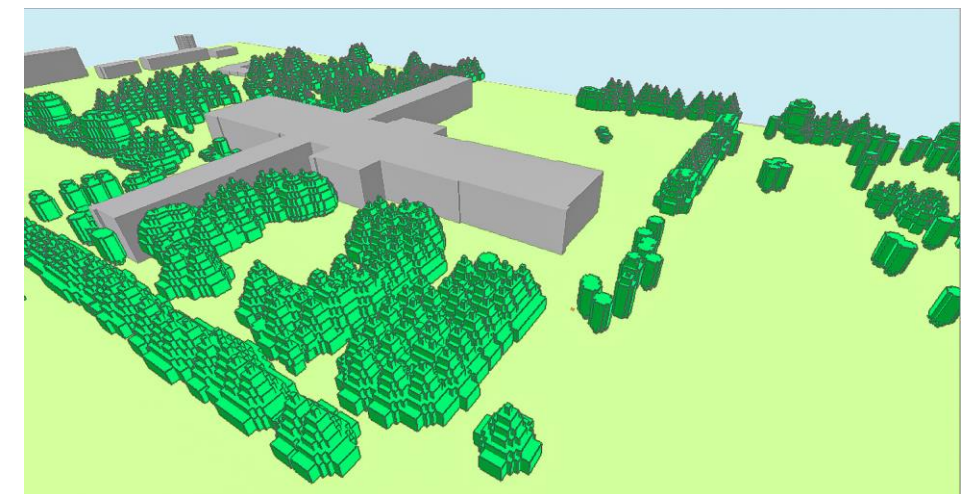
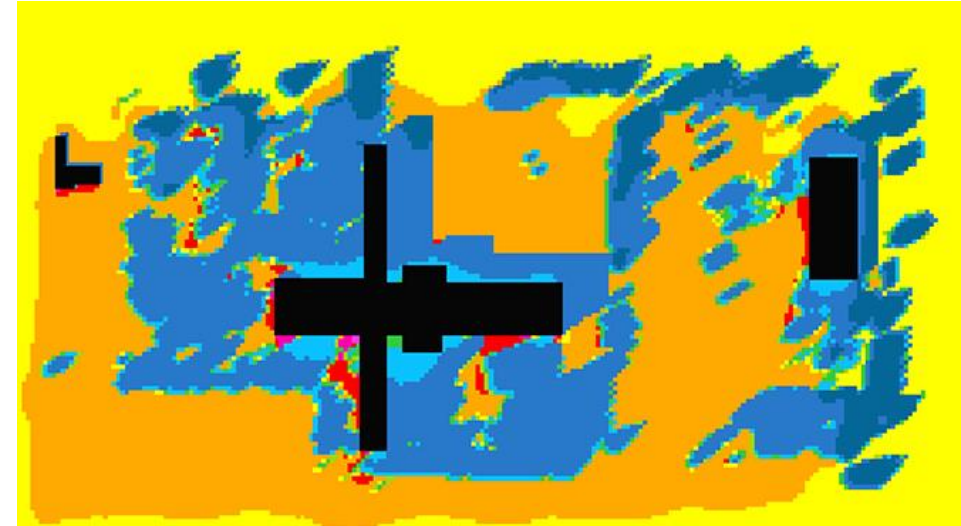
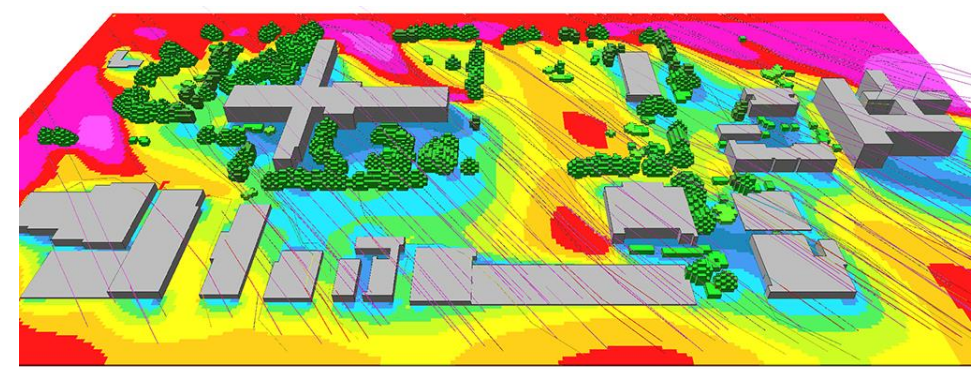


Urban climate assessments

- Monitoring and modeling of urban mesoclimatic anomalies: urban heat island, dry island.
- Hydrothermal regimes of urban soils.
- The mutual influence of green infrastructure and climate in the city.
- Predicting the sustainability of urban green infrastructure for various climatic scenarios.

Micro-scale climate modeling and mapping of wind fields for various building and landscaping plans

- Wind flow (Wind patterns in complex environments, Wind speed around buildings and trees, Wind comfort)
- Outdoor Thermal Comfort (Air temperature, Radiant temperature of surrounding surfaces, Air movement in the vicinity of the body, Relative Humidity)



Sustainable urban ecosystems

practices in the assessment of ecosystem services for the tasks of urban planning and sustainable development of territories

GreenSpaces – web-GIS for managing urban green infrastructure – <https://www.r3-trees.com>

allows to manage all information about public greenery and objects included, such as trees, lawn areas, street furniture, pavements, hedges etc.

- Very-high resolution digital terrain analysis
- Remote plants assessment using very-high resolution IMA / UAV data
- Soundscape ecology (Zoom H4 (Zoom Inc.) and Song Meter SM4 (Wildlife Acoustic™))
- Find more: sunlab.rudn.ru/technologies



Master Program “Management and Design of Urban Green Infrastructure (MDUGI)”



Advanced, two-year, interdisciplinary double degree master program in urban and environmental studies, incorporating landscape architecture and geosciences.



Objective

To train qualified personnel in the field of design, implementation and maintenance of green infrastructures in complex conditions of an urban environment.



Result

- Master of Landscape Architecture (Standard of education in Russian Federation)
- Master of Forest and Environmental Science (Standard of education in Italy).



Location

1 year - at RUDN University (Moscow, Russia)

2 year - at the University of Tuscia (Viterbo, Italy)



Participants

10-12 students each year from around the world and across the academic areas



Scholarship

Grant support from RUDN, European Grant Programs, special State scholarship of the Province of Lazio (Italy).



Admission

- an interdisciplinary oral exam (urban ecology and landscape design)
- an interview in English



Deadlines

The application window is open from April 1, 2021.

The deadline is August 1, 2021.



www.facebook.com/mdugiprogram



www.instagram.com/mdugiprogram



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3mUGIS

Monitoring, Modeling and Management of Urban Green Infrastructure and Soils

**“ANTHROPOGENIC AND NATURAL SOIL LANDSCAPES
IN EUROPEAN RUSSIA: FROM SEA TO SEA”**

**INTERNATIONAL
ONLINE SUMMER
SCHOOL**

July 26 - August 2, 2021

- ecology and biogeochemistry of urban soils and plants,
- advances in monitoring and modeling of urban soils and green infrastructures,
- role of nature-based solutions and urban green infrastructure for human health and well-being.



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Thanks!

Any questions?

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