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ENVIRONMENTAL DISPERSION SOFTWARE

COMPUTING

Simulation tool which generates and evaluates models of environmental interactions with infrastructure for urban design.

TECHNOLOGY TYPE

Simulation & Modeling
Software

STAGE OF DEVELOPMENT

- Validated for urban climate-related applications.

- Ongoing integration into real world environments such as agriculture, building energy use, and more.

LEARN MORE

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TECHNOLOGY SUMMARY

Continuous commercial and residential developments have negatively impacted the environment by constraining resources, while increasing noise and air pollution. Computational dynamics solvers simulate the interaction between infrastructure and the environment, allowing civil engineers to understand environmental variables that impact design. Use of these simulations, however, is limited by time constraints because model development often takes multiple days.

The Environmental Dispersion Software evaluates various design scenarios by rapidly simulating relevant climate variables. The software uses traditional central processing and new graphics processing units to produce solutions based on buildings, vegetation, and other parts of a city more rapidly than traditional computational dynamics solvers. The Environmental Dispersion Software computes wind speed/direction, turbulence, air temperature, humidity, and atmospheric radiation in a given area. The software also evaluates how these factors, as well as dispersion and deposition of particle contaminants, will affect buildings and vegetation. The software can be used to evaluate urban designs for optimal air quality, energy use, and environmental impact.

FEATURES AND BENEFITS

- Enables rapid assessment of various environmental factors impacting a targeted area.
- Improves design response.
- Demonstrates potential for assessing strategies for emergency response, natural disaster planning, and agriculture evaluation.

RECENT PUBLICATIONS

Gunawardena, N., Pardyjak, E.R., Stoll, R., Khadka, A. (2018). Development and evaluation of an open-source, low-cost distributed sensor network for environmental monitoring applications. *Measurement Science and Technology*. 29(2):024008. doi: [10.1088/1361-6501/aa97fb](https://doi.org/10.1088/1361-6501/aa97fb)

INVENTOR PROFILE

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