

MONITORING TREES IN CITIES USING THE *INTERNET OF TREES*

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Introduction: *Internet of Things* is the concept where sensors and data processors interact with each other. With the technology developed at the KULeuven DRAMCO [1], this offers an opportunity to collect large amounts of continuous data, e.g., of trees. City or town authorities need information regarding the condition of the trees in public spaces that they manage. Placing sensors that record properties that are correlated with its condition can be an instrument for monitoring a tree's health.

Aim: This pilot project verifies if this approach offers the possibilities mentioned.. The study sheds light on which properties to monitor and their complexity: many factors (environment, species, etc.) are assumed to have an impact on the data and thus its usability.

Materials and Methods: Nine sensor modules were placed, recording two temperatures: a reference temperature near the tree and the tree's temperature "on" its bark (shielded from outside weather effects). Data were collected for eight months. Thorough statistics were performed on the data to analyse its complexity and usability.

Results: At the time of submitting this abstract, the analysis was not finished (it will, however, be by the time the conference is held). First results show indeed a relationship between the two temperatures. Besides providing information about the condition, this can also provide insights on the effect of trees on their surroundings: trees have a regulating effect on (micro)climates, e.g., buffering the urban heat island effect.

Furthermore, some data already show some effects of species or plant location.

Conclusion. The presented research shows that, with a certain number of conditions in mind, adopting IoT could be an interesting method to record continuous and geographically diffuse data of trees. Data that can be used for tree monitoring or ecological and environmental studies.

Keywords: *Internet of Things, tree monitoring, tree temperature*

References

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