Neural network has learned to identify tree species

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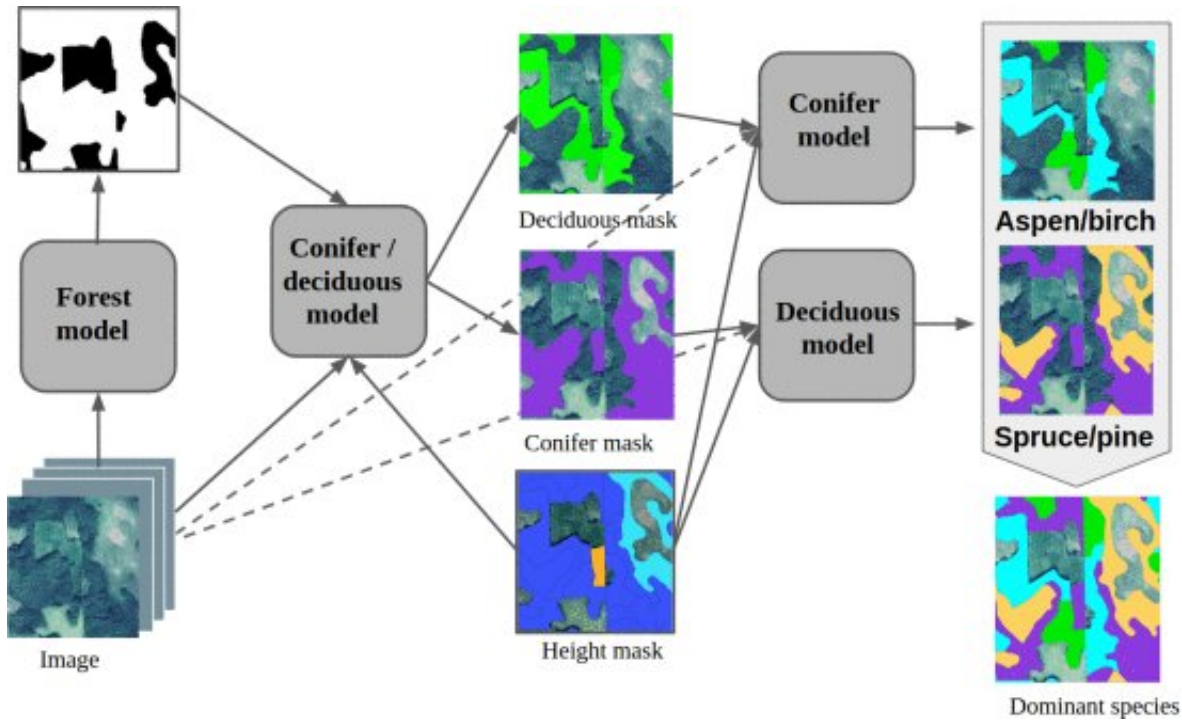

Hierarchical model structure. Credit: Svetlana Illarionova et al., IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Skoltech scientists have developed an algorithm that can identify various tree species in satellite images. Their research was published in the *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.

Identifying tree species is essential for efficient forest management and monitoring. Satellite imagery is an easier and cheaper way to deal with this task as compared to other approaches that require ground observations of vast and remote areas.

Researchers from the Skoltech Center for Computational and Data-Intensive Science and Engineering (CDISE) and Skoltech Space Center used a neural network to automate the identification of dominant tree species in high and medium resolution images. A hierarchical classification model and additional data, such as vegetation height, helped further enhance the quality of predictions while improving the algorithm's stability to facilitate its practical application.

"Commercial forest taxation providers and their end users, including timber procurers and processors, as well as the forest industry entities can use the new technology for quantitative and qualitative assessment of wood resources in leased areas. Also, our solution enables quick evaluations of underdeveloped forest areas in terms of investment appeal," explains Svetlana Illarionova, the first author of the paper and a Skoltech Ph.D. student.

There are plans to integrate the developed algorithms in the Geoalert platform to automate the production of forest engineering materials marketed via Parma-GIS.

More information: Svetlana Illarionova et al. Neural-Based Hierarchical Approach for Detailed Dominant Forest Species Classification by Multispectral Satellite Imagery, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (2020). DOI: 10.1109/JSTARS.2020.3048372

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