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Holucator – Lichens Edition: Targeting small organisms with the HoloLens

Immerse yourself in the microcosm of lichens using the HoloLens and learn how to differentiate different species using fascinating structures, just like environmental science students do on excursion.

On their biodiversity excursions students of environmental science map the distribution of a set of species belonging to an organism group. They prepare with an online tutorial consisting of an identification key, video material and a final test. In the field, however, the initial classification of certain groups of organisms is still difficult because size, appearance and detailed characteristics can differ from the visual material in the tutorials. Thus experts normally have to provide initial assistance.

In the case of lichens with their very stable location on trees, however, the Hololens can take over this function. Our Holucator app recognizes individual trees by their bark structure and highlights lichen colonies whose position has been entered previously in teaching-mode. Users can then interactively select species names in a multiple choice question, tag colonies of the same species or call up detailed information about the lichen species in focus, such as sketches of of charateristic structures. The Hololens-Architecture even allows to use conventional lenses at the same time. A total of 12 trees with 8 different lichen species are available at the Bürkliplatz site, so that several students can practice simultaneously and then begin with the actual species mapping.

The Holucator App was first used in March 2018 by a total of 40 students. The fascination with the new medium was clearly at the forefront of the students' feedback and the actual knowledge gained was not recorded. Nevertheless, we were able to establish that the time the students spent individually observing the lichens was clearly longer compared with the expert-instruction-scenario.

The Holucator (Lichen-Edition) App is the first outdoor application of the HoloLens at the ETH. It can be adapted for other similar applications, provided that the objects to be examined have a permanent location and a sufficient amount of fixed objects nearby to allow the HoloLens to orient itself in space.