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Recognition of meadow saffron sites in drone images, using a machine-learning approach

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Meadow saffrons (*Colchicum autumnale*) are toxic autumn-blooming flowering plants, which often grow on meadows and pastures, and thus pose a threat to farm animals especially in hay. However, weed control is often difficult on these grounds since it is desired to minimize the damage to the fauna and surrounding flora. That is why site-specific counter measures, targeting only a small area around the toxic plants, are sought.

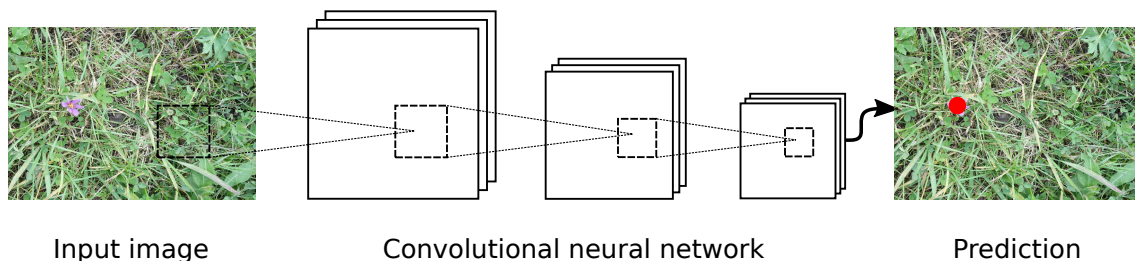


Figure 1: Visualization of the presented method to recognize meadow saffrons sites. (To improve visibility, no drone images are shown.)

One option is to employ drones to acquire high-resolution photos (in the visible light range) of the fields. Since the geolocation is tracked, it is then possible to locate the meadow saffrons on these images and to compute their exact GPS-position using offline methods. Based on these detected sites, application maps for the weed control tools, such as heat treatment or cutting, are created.

In this talk a procedure to localize blooming meadow saffrons in drone images is presented. This approach relies on convolutional neural networks to recognize the blossom sites, see Figure 1. The training data based on hand-labeled images is further enhanced through image augmentation, which leads to improved stability of the prediction against, e.g., alterations of lighting.