University of Basel
Department of
Biomedical Engineering

University of Basel, Department of Biomedical Engineering, Gewerbestrasse 14, 4123 Allschwil

Master of Science – Biomedical Engineering
Thesis Proposal

Automated Inspection of Tiger Mosquito Traps with Deep Learning

Aedes albopictus, commonly known as the tiger mosquito, is an invasive species in Europe. Originating from Southeast Asia, they spread through southern Europe and now arrived north of the Alps. As they can transmit tropical diseases such as Dengue fever or Zika, the Swiss Tropical and Public Health Institute started a monitoring project that tracks new breeding sites, with the goal to keep down the spread (https://www.swisstph.ch/de/topics/tigermuecke/). Within the scope of this monitoring project, traps are placed all over Switzerland, where the mosquitoes lay their eggs on wooden paddles. At the moment, those paddles are manually checked for eggs of *Aedes albopictus.* However, two related but harmless species, i.e. *Aedes japonicus* and *Aedes geniculatus*, also lay their eggs in those traps. It is a cumbersome work to distinguish eggs of those three species by bare eye.


Aedes albopictus


Aedes geniculatus


Aedes japonicus

The goal of this project is to explore whether a deep learning classification network can automatically distinguish between the three species and thereby speed up the inspection of the traps. Once this works, a next task is to count the eggs present on one paddle. The overall goal is to provide a tool that can be used in the everyday application.

Nature of the Thesis
Programming: 80%
Documentation: 20%

Specific Requirements
Programming skills in Python

Supervisors
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