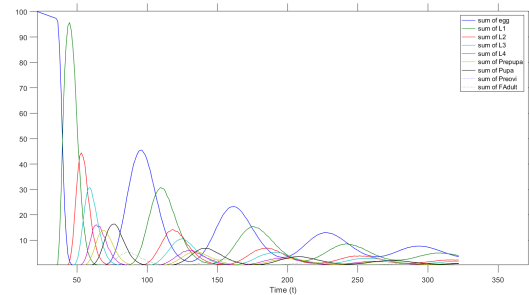


## Bachelor's Thesis or Student Assistant

### Java-Based Web Simulation Application

#### Contact

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#### Problem Statement

In the field of agriculture, crops harvesting is always dependent towards control of herbivorous insects in certain regulated environment. Correspondingly, an efficient control of herbivorous insects is required by the agricultural industry for the sake of maximizing the agricultural products or crops.

#### Investigation

Concern over declining biodiversity and the implications for continued provision of ecosystem services has led towards intensive research effort to describe relationships between biodiversity and ecosystem functioning. Here we extend this effort to the relationship between natural enemy species diversity and natural pest control. From simple modeled food-webs and simulations of natural enemy species loss we derive specific predictions concerning the effect of herbivore life-history traits, such as life-cycle type and variance (reflecting species composition effects) of the relationship between natural enemy diversity and pest-control.

#### Solution

A predictive-based simulation system is created for the purpose of stochastic simulation of a greenhouse with several containers (crops). The predictive simulation system constructed is able to mimic the biodiversity of the greenhouse with a high degree of accuracy.

#### References

- L. Hemerik, and E. H. Nes. Predicting the potential establishment of two insect species using the simulation environment insim (insect simulation). *Entomologia Experimentalis et Applicata*, 159(2):222–229, 2016.
- M. Wubs, R. Böckmann, R. Meyhöfer, and L. Hemerik. Modelling development of the whitefly *Trialeurodes vaporariorum* for a decision-support-system. In *Proceedings of the Netherlands Entomological Society meeting*, volume 25, 2014.