



## Identifying and Resolving Feature Interactions in greenhouse climate control

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New climate control strategies from the research world can contribute to a sustainable climate control for industrial plant nurseries. It takes a long time for new climate control strategies to move from the research environment to be employed in the industry.

One of the main reasons for this long adjustment time is the complexity that arises, when the new climate control strategies are combined with existing strategies. When separate climate control strategies are combined in a climate control system, they will interact with each other through their common shared environment. Problems arise when control strategies interact with each other and result in an undesirable climate control output. Unintentional behaviour, as a result of interaction between complex control strategies, is known in the literature as the feature interaction problem.

This Ph.D. thesis contributes with a Feature Interaction Manager, that allows separate climate control strategies to be combined in one system, while the interactions between climate control strategies are handled. The Feature Interaction Manager uses an evolutionary search mechanism to find a solution, that satisfies control strategies. In the case of incompatible control strategies the Feature Interaction Manager supports, that the cause can be visualized and explained to the gardener, who can then make an informed decision to resolve interactions.

The Feature Interaction Manager has been used in an industrial greenhouse climate control system designed for the cultivation of ornamental plants. Experiments show that The Feature Interaction Manager finds solutions, when climate control strategies are compatible, and that conflicts are identified and explained in the case of incompatible control strategies.

