

A U S H A N G

FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Montag, 8. Juli 2013, 12.15 Uhr

**Ort: Institut für Informatik, Takustr. 9, 14195 Berlin
Seminarraum 049**

Disputation über die Doktorarbeit von

Herrn Tim Landgraf, M.Sc.

Thema der Dissertation und Disputation:

**RoboBee: A Biomimetic Honeybee Robot
for the Analysis of the Dance Communication System**

Die Arbeit wurde unter der Betreuung von **Prof. Dr. R. Rojas** durchgeführt.

Abstract: The honeybee dance communication system is one of the most intriguing examples of information transfer in the animal kingdom. After returning from a valuable food source, honeybee foragers move vigorously, in a highly stereotypical pattern called waggle dance, on the comb surface conveying polar coordinates of the field site to a human observer. The recruits find the announced field site after following the circles of the dancer in an equally stereo-typical following behavior. After 70 years of intense research, it still remains unknown how those bees decode the dance. To resolve this question I have built a robotic honeybee that is able to reproduce stimuli found to be emitted by waggle dancers. By imitating single stimuli or stimulus combinations and tracking the bees' consecutive behavior it is possible to identify essential signals in the communication process. In this talk I show interesting properties of the honeybee dance communication system and an analysis of the motion dynamics of dancers and dance followers. From this data, I deduce a parametric model of the dance, the core of the dancing robot, which is then presented in its important aspects of hardware and software. The remainder of the talk focuses on the results of field experiments with RoboBee conducted in live honeybee colonies..

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. R. Rojas