Fall 2010 Seminar
Department of Computer Science
University of Houston

WHEN: WEDNESDAY, SEPTEMBER 29, 2010
WHERE: PGH 232
TIME: 11:00 AM

SPEAKER: Raul Rojas, Freie Universität Berlin and Rice University

Host: Dr. Ernst Leiss

TITLE: RoboBee: A robotic bee for investigating the bee dance

ABSRACT:
The bee dance is an astonishing example of symbolic communication in the animal world: bees communicate the position of a food source telling their nestmates in which direction and how far away the source is.

In this talk, I will present a robotic bee we have been working on for about three years. The robot has been designed to mimic the bee dance in real honeycombs. The robot body is connected to a rod which can displace the body in the x-y-z direction, so as to imitate the movement of a bee on the surface of the nest and its waggle dance. Two video cameras provide an overview of the robot's surroundings and are used for obstacle avoidance. The robot has wings which vibrate during the waggle dance, and a tube which can dispense nectar samples to the follower bees. In our project we track followers when they leave the nest using harmonic radar. Small antennas are glued on the back of the bees and their flight trajectory is recorded in the computer. This allows the experimenter to check if the followers are able to decode the bee dance.

I will report on our latest results and the objectives of our project towards modelling the bee dance as a sender-receiver system, and computing the precision of information transmission at all stages.

Joint work with the Biology Department of Freie Universität Berlin,
Prof. R. Menzel.

Bio:
Raul Rojas has been a professor at the Mathematics and Computer Science Dept. of Freie Universität Berlin since 1997. He studied Mathematics and Economics in Mexico, before getting his PhD and "Habilitation" in Germany. He was a professor of CS at the Technical University of Vienna and University of Halle (Germany) before moving back to Berlin. His fields of expertise are pattern recognition, machine learning, computer vision and robotics. Two years ago, he received the "WissensWerte" Technology Transfer Prize in Germany for his work on reading systems for the blind, and the Gold Medal of the Institute of Science and Technology in Mexico for his robotics work. His robotic teams have won the robotic soccer world championship several times.