Abstract of Habilitation thesis

Aktive Szenenauswertung und Objekterkennung

Active scene exploration and object recognition

Ulrich Büker, 2001

Abstract

A series of developments and improvements has been made in the field of computer vision during the last years. However, the performance of the human visual system could not be achieved at all. In this thesis, a system will be introduced which shows promising prospects for robot vision sytems. Therefore, several ideas have been borrowed from biological systems. The architecture of the system incorporates that on one side humans can holistically recognize objects up to a certain complexity without intensive training cycles. On the other side, humans explore complex scenes by looking around and orientating themselves. In this sence, vision is not passive but an active process in which purposfully new view points and viewing angles are taken to orientate in an unknown surrounding. Against the background of these observations a system has been designed and developed, which simulates holistic recognition on a subsymbolic, neural level and combines them with symbolic, decompositional object models. These models describe recognition as an active process. The capabilities of the system are shown by two practical applications in the field of robotics.