

Fagerer et al. 1994: In the **US-German Spacelab mission D2** (April/May 1993) a new level of automation capabilities has been achieved with the ROTEX-'freeflyer'-experiment of DLR [G. Hirzinger]. For the first time, a combined human / robotic task force on the ground succeeded in visually controlled tele-grasping of a free floating object on board the Space Shuttle Columbia within a working cell of the German Spacelab by a remotely controlled robot arm. The contributions of UniBwM in the fields of monocular motion-stereo vision, state prediction and fully automatic grasping under long delay times (5 to 7 seconds) are discussed in detail. The successful team jointly consisted of scientists from DLR and UniBwM for decision making and remote manual control as well as a network of computers representing a robot specialist for visual motion interpretation and prediction including the expertise for delayed feedback, which is hard for humans.