



Thesis Project Form

Title (tentative): Integrating Computer Vision into the Control System of an Upper Limb Exosuit

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Description

Motivation and application domain

The integration of computer vision technology into the control system of upper limb exosuits represents a promising avenue for the advancement of human-machine interaction in the field of rehabilitation, assistive devices, and industrial applications. This thesis proposal aims to explore the feasibility and potential benefits of integrating computer vision techniques into the control mechanism of an upper limb exosuit. By leveraging the capabilities of computer vision, the exosuit can be designed to interpret and respond to the user's intentions and gestures, thereby enhancing the overall usability, adaptability, and naturalness of the human-machine interface

General objectives and main activities

This research will employ a combination of literature review, theoretical analysis, and practical experimentation. The initial phase will involve an extensive review of relevant literature on upper limb exoskeletons, computer vision techniques, and their integration in the context of human-machine interaction. Subsequently, a prototype of the upper limb exosuit with an integrated computer vision-based control system will be implemented. The performance and usability of the proposed system will be evaluated through controlled experiments and user studies, with a focus on assessing the accuracy, responsiveness, and user satisfaction of the integrated technology.

Training Objectives (technical/analytical tools, experimental methodologies)

1. Background literature analysis
2. Identification of key challenges integrating computer vision into the control system
3. Evaluation of performance, usability, and effectiveness of the computer vision-enabled control system

Place(s) where the thesis work will be carried out: Heidelberg University

Additional information

Maximum number of students: 1