VIACTORS

Variable Impedance ACTuation systems embodying advanced interaction behaviORS

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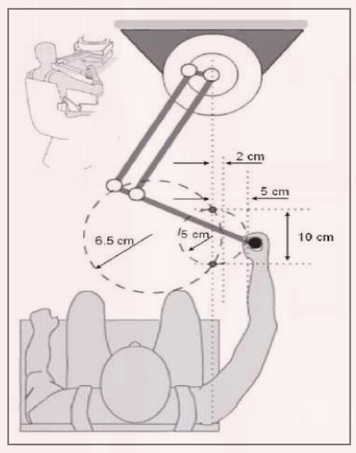
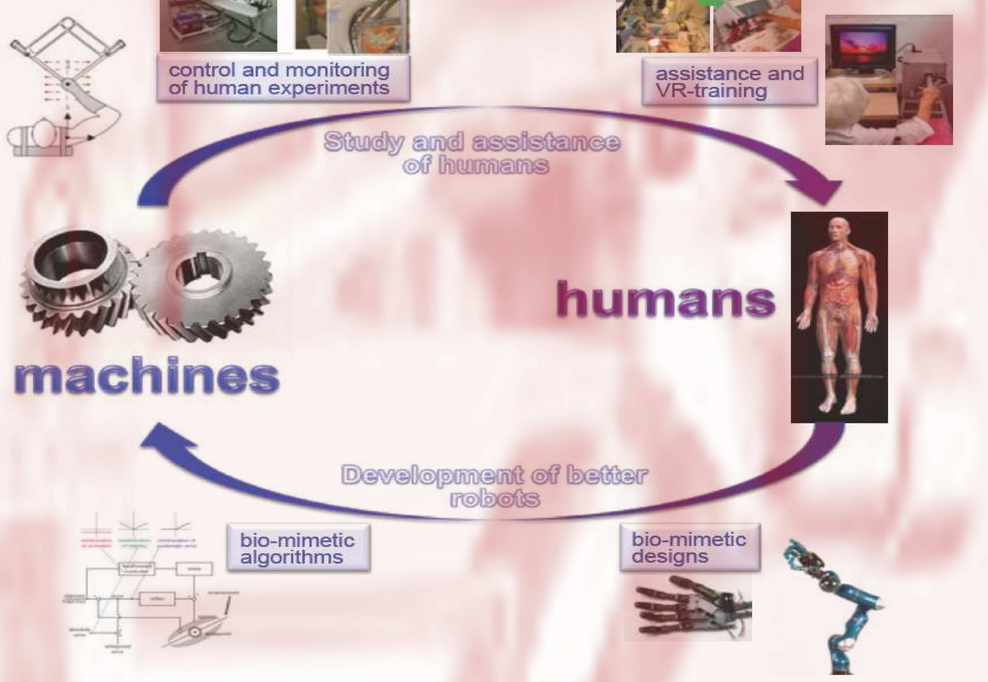
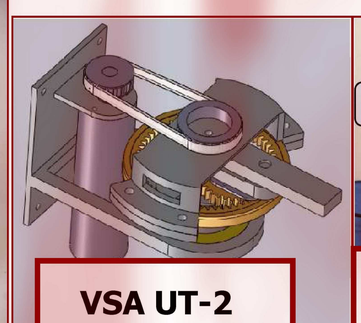
Study **of physical and biological principles** governing human motor control and learning



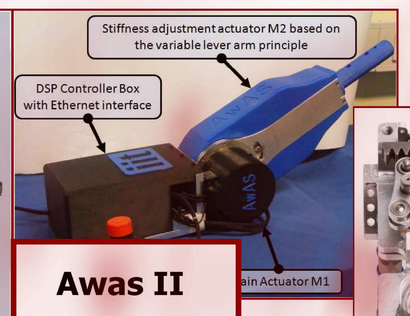


Development of New **Variable Impedance Actuators (VIA)**: Embodying intelligence for safe, efficient and compliant systems.

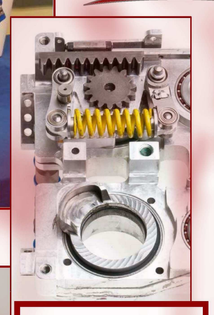
VSA-HD



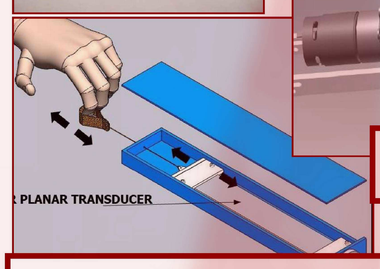
VSA UT-2

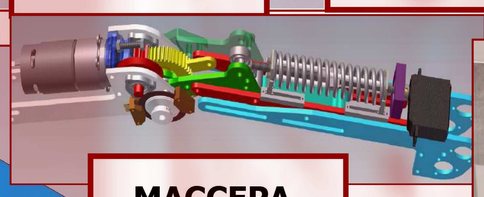


Awas II



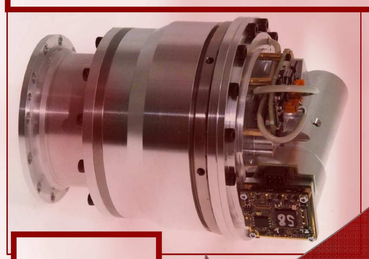
BAVS



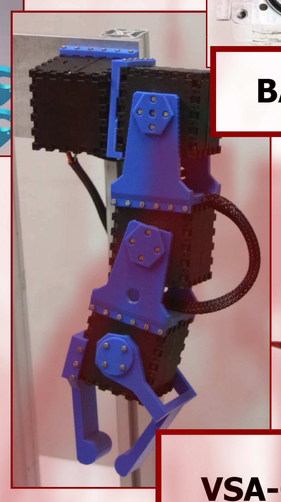


MACCEPA

multi-layer dielectric elastomer transducers

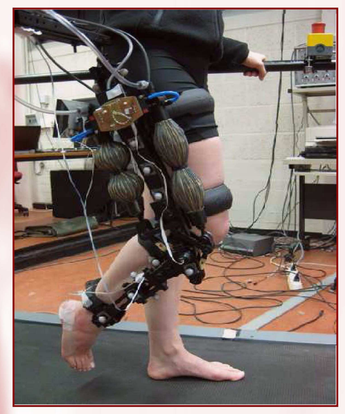


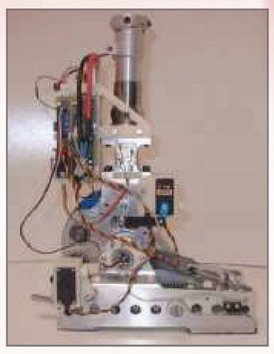
FSJ



VSA-Cube

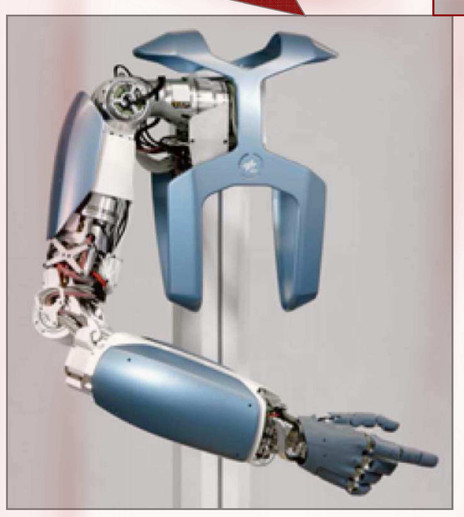
VIA for Rehabilitation

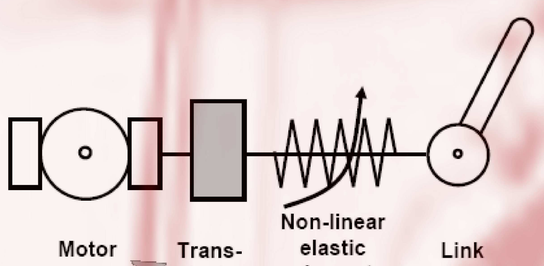




Study of the similarities between rehabilitation and motor learning in healthy subjects as a tool to develop efficient rehabilitation strategies.

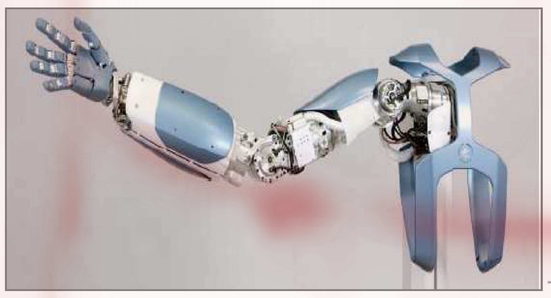
VIA for Arms and Hands

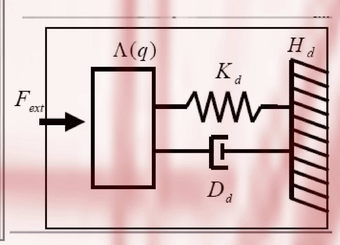




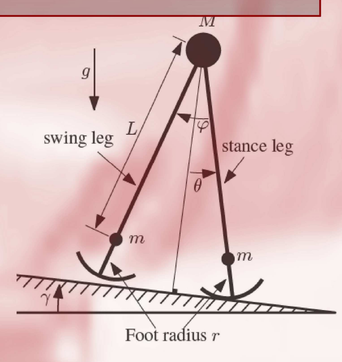
Desired joint properties:
- Adjustable position
- Adjustable stiffness
- Adjustable damping

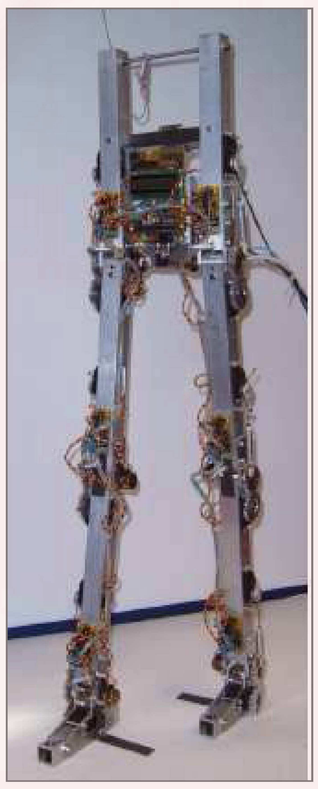
Control goals





VIA for Locomotion





By using VIAs, the natural oscillatory dynamics of the system can be tuned to closely resemble the desired periodic motions required for the gait patterns. In addition, introducing compliance to the legs can enlarge the intrinsic overall robustness of the system to disturbances.

The DLR Hand Arm System mimics the kinematics and dynamics of the human arm using passive variable compliance actuators.

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