

New hydraulic leg for the humanoid hydraulic robot HYDROïD

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This work aims to contribute toward the development of a highly dynamic robotic ankle and knee mechanisms for the humanoid hydraulic robot HYDROïD. A new ankle mechanism is looked for to tackle the drawbacks raised by the performances achieved with the original old ankle mechanism. Lower leakage and friction rates are achieved in addition to pressure optimization for the ankle joints. Moreover, a new solution for optimizing the weight of hydraulic actuators is applied on the knee mechanism of the robot. Such solution includes the usage of light composite material technology to achieve optimized weight and performance for the joint. In order to apply position control methodologies on the ankle and knee mechanisms, inverse geometrical model for the both mechanism is presented. Position control is used to control the joints angles of the ankle and the knee mechanisms. Finally, the conclusions and the future perspectives are presented.