Storyboard movie for ECHORD++ project MODUL

[Husky and Nifti robot have troubles to overcome obstacles]

{Marco:} mobile robots have made significant progress over the last decade and their market is massively growing. However, even the best vehicles are still not able to overcome even small obstacles of our daily life and if they are, it is by far not as graceful as humans or animals.

[human and anymal shot on feet]

{Marco:} In order to provide machines that can not only work on perfectly flat ground but which can traverse challenging terrain we need to develop legged robots with similar performance as their natural counterparts.

[Show all legged robots (ALOF, StarlETH, ANYmal)]

{Marco:} Our group has been researching this area for more than seven years during which we developed a series of quadrupedal robots and became a worldwide leader in this area. As a key element, we make use of an actuation principle based on electric motors, gears and springs which behaves very similar to a muscle tendon system.

[Showing the actuator in the hand]

{Fabian:} We compactly integrated this actuation principle in these smart joint units with embedded motor control electronics.

[Performance video of ANYdrive]

Like a traditional drive, this actuator can precisely track a desired joint position. Thanks to its integrated compliance and feedback control, it can accurately regulate the output force with almost zero output impedance and robustly withstand impulsive loads during collisions. Furthermore, the actuator sense unexpected output loads and hence safely interact with humans or the environment.

[ANYmal short]

{Fabian:} This joint unit allows us to modularly build up complex robots without additional bearings, transmission, sensors, or electronics.

ANYmal, our newest generation of robots is a robust, outdoor capable quadrupedal machine with a total weight of about 30kg and an autonomy of about 3h.

Thanks to our actuation approach are able to combine dynamic locomotion capability with superior mobility required to climb obstacles.

[Interview Christian, video with inspection]

{Christian} A first application is to support operators on off-shore oil platforms, who have to work in harsh and challenging environments. The oil and gas company Total invited us to France to evaluate our robot under real conditions. They want the robot to autonomously inspect sensors like manometers and detect anomalies. ANYmal could successfully map the site and do other tasks that were required.

The robot needs to climb very steep stairs to work on several levels. Due to its unique configuration ANYmal can do that in an unconventional, but safe way.

Since ANYmal can place its feet very precisely, it can operate in sensitive environments without touching and damaging delicate and expensive objects, which is a great advantage compared to wheeled vehicles.

[Final Interview Marco]

With the help of ECHORD++, we were able to create a robuts and reliable prototype that can be distributed to research institutes and first customers. With continuous training and improvement of our software and hardware we are convinced that this is the future of mobile robots.