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Press Release

Autonomous robots amongst the vines.

In France's Bordeaux region, robots autonomously eliminate grass and weeds between the vines, making pesticides unnecessary. To enable the robots to navigate the hilly terrain, the developers looked to the Mars rovers for answers.

The wine region around Saint-Emilion in France is world famous and steeped in tradition. Winemaking here goes back to the Roman age. These days, robots help with the laborious care of the vines. The Vitirover, developed by the eponymous company in Saint-Emilion, is one of these robots. It is a fully autonomous lawnmower powered by solar energy. About twenty of these robotic mowers are in use in the vineyards. This year, Vitirover will deliver 200 more robots, for example for use along railway tracks or in photovoltaics plants. The main benefit of the robot is that it is environmentally friendly and helps to make organic wine. The use of the robot in the vineyards makes pesticides like glyphosate unnecessary. In addition, the robot protects the soil by avoiding the compaction that may be caused by tractors or horses.

The development of the robot, which is able to mow more than two hectares of land, wasn't an easy task. As it turned out, the unstable soil in the vineyards is quite similar to the surface of Mars. This is why, when drafting the first design specifications, Vitirover collaborated with the European Space Agency (ESA) to review the designs of all of the robots that were developed for Mars missions. "This really helped us, because we couldn't find any terrestrial robots that came as close to our specifications," says Xavier David Beaulieu, CTO at Vitirover. He started the company in 2010, together with Arnaud de la Fouchardière. After taking over the Château Coutet winery in Saint-Emilion, he faced the challenge of controlling the growth of grass and weeds between the vines.

The robot negotiates rocky, often steep terrain and is exposed to mechanical stresses every 12 seconds, on average. The requirements for its motorisation were accordingly high. The mechatronic solutions are the result of a partnership spanning more than eight years between Vitirover and MDP (maxon France). The robot is driven by four DC motors, one per wheel. They are brushed DCX 22 L drives that offer maximum power density in a very small installation space. They are highly efficient, which is important in battery operation. Combined with a GP 32 C gearhead, this solution enables the mower to absorb the load on the wheels and deliver the torque required for traction. "In terms of the drive, the problem of the radial load on the wheel axle wasn't an easy one to solve. However, in the end we did it," says Xavier David Beaulieu.

The greatest challenge however was elsewhere, namely the three blades that are driven by DCX 32 L series DC motors. The high load tended to damage the ball bearings of the motors, which led to failures. The engineers at maxon finally developed an aluminium bell housing for sustainable protection. Kevin Schwartz, in charge of the Vitirover project at MDP: "Our role is not limited to delivering electric motors. Instead, we supply complete solutions that fulfill the needs of the customer."

For further information please contact maxon motor Australia tel. +61 2 9457 7477.

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The press release is available on the internet at: www.maxongroup.net.au



Vitirover autonomous robot © Sylbie Monin; Vitirover.

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The Swiss specialist for quality drives

maxon is a developer and manufacturer of brushed and brushless DC motors, as well as gearheads, encoders, controllers, and entire mechatronic systems. maxon drives are used wherever the requirements are particularly high: in NASA's Mars rovers, in surgical power tools, in humanoid robots and in precision industrial applications, for example. To maintain its leadership in this demanding market, the company invests a considerable share of its annual revenue in research and development. Worldwide, maxon has more than 3000 employees at nine production sites and is represented by sales companies in more than 30 countries.

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