

## Testing robotic vehicles

The Aberystwyth Natural Terrain for Unconstrained Robotics - ANTUR or Welsh for 'adventure' - is a collaboration between Aberystwyth University's Computer Science Department and Pwllpeiran. Autonomous farming, last mile delivery services and self-driving off-road vehicles can all be put through their paces at the new large-scale robotic testbed which has access to 500 ha of land ranging from smooth grassland to bog, rocks and mud, plus 11.5 km of tracks. The site is split into two different areas, each having a supporting 8 m x 20 m secure workshop/office with internet and power. These are powered by 4.9 kWp solar panels combined with 20 kWh of battery, which provide AC at 240V, 5000VA. There are LoRaWAN gateways covering the areas and mobile phone coverage in most places. The facility is complemented by state-of-the-art electronics and mechanical workshops on the Penglais Campus at Aberystwyth.



ANTUR is already being used to test the latest innovations in autonomous vehicles for land and air developed by staff within the Department of Computer Science, and research or commercial organisations wishing to use the facility also have access to two off-road robots with a payload of several 100 kg. Idris is 4-wheel drive and 4-wheel steer, and Tryfan is 6-wheel drive and skid steer. Both can come equipped with LiDAR, a ZED2i camera, a catadioptric omni-directional camera, differential RTK GNSS, an IMU, and a bespoke robotic operating system. Both can also be adapted to specific project needs.

The developments at Pwllpeiran so far have been funded by the Welsh Government, HEFCW, and the UK's Department of Business, Energy and Industrial Strategy. The next stage is to install automatic gates along the tracks so that robotic vehicles can travel greater distances without stock needing to be removed from fields (the vehicles travel very slowly and the animals have plenty of time to move out of the way, plus they are fitted with sensors and are programmed to avoid any obstacles). Further developments planned for ANTUR included building a large indoor test facility.

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