NVIDIA

SOLUTION SHOWCASE

arculus

arculus Modular Production

Challenge

- Build-to-order vehicles are expensive and inefficient to produce
- Manufacturers face delays when building vehicles with many variations
- Traditional production lines require the vehicle to stop at every station

NVIDIA Solution

- Substantial computing power
- Exceptional energy efficiency
- Ability to scale

Results

- Improved efficiency of automotive production lines and other verticals
- More cost-effective production of built-to-order vehicles
- Minimized non-value-added interaction by people or machines

ARCULUS INCREASED EFFICIENCY BY UP TO 30% USING A NEW MODULAR PRODUCTION MODEL

> *"We chose to equip our arculees with NVIDIA Jetson TX2 modules due to their ability to process significantly more data than industrial PCs, without consuming tons of energy. Plus, the ability to scale is of huge benefit to us."*
>
> - **Max Staehr,** CTO Robotics at arculus

Arculus Modular Production

Pioneering a Modular Production system that has driverless transport systems at its heart has been the goal of arculus since its inception. These systems are powered by the Jetson TX2 supercomputer-on-a-module for AI at the edge, enabling them to navigate independently between vehicle production stations.

This makes production much more flexible. Each station is configured for any number of tasks and the products don't have to form an orderly queue, nor stop at every station. Instead, they can skip stations that are irrelevant to the car that they're transporting. If one station is busy, they can simply bypass it and head to one that's free.

NVIDIA Platform

Coordinating fleets of autonomous mobile robots in the factory begins with the arculees central control platform. The platform uses AI to identify and optimize the most efficient route for each vehicle through the production chain. Each of the individual robots in the autonomous fleet follows the optimized route to its target station. The integrated Jetson TX2 module processes video data in real time captured by the machine's network of cameras, LIDAR, encoder, and IMU data, enabling an arculee to recognize any obstacles in its path and navigate safely around them.

Without the compute power of Jetson TX2, the arculees wouldn't be able to implement the autonomous decisions of the central control platform and avoid obstacles in their path.

Products Used

- NVIDIA® Jetson™ TX2
- Jetson AGX Xavier™

Processing Engines Used

- LIDAR
- Encoder
- Inertial Measurement Unit (IMU)
- Cameras

Software Used

- NVIDIA CUDA® for GPU acceleration
- ArrayFire
- Gunrock

Arculus Results

Manufacturers that employ a modular approach can increase efficiency by up to 30%, according to arculus. They'll also reduce operational costs, leaving more to invest in new technologies and mobility concepts. By using NVIDIA Jetson TX2, arculus has built a fleet of autonomous mobile robots that can scale, are energy efficient, and can power the assembly process of the future.

Now the company is looking to NVIDIA Jetson AGX Xavier for training its systems to perform simultaneous mlm localization and mapping (SLAM). This will enable the robots to also create 2D and 3D models of their environment from data supplied by stereo cameras and image processing systems.

About Arculus

Headquartered in Munich, Germany, arculus is the company behind the modular production revolution.

The company was founded with a mission to reinvent manufacturing. For the last 100 years, production has followed a structured line system and built optimized workflows around it. arculus believes the time has come to take the next step and set Modular Production as the new industry standard.

arculus
MODULAR PRODUCTION

LEARN MORE

Contact us: **jetson@nvidia.com**
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Learn more about arculus at: **www.arculus.de**

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