



# Autonomous wheel loader control system

**A new control system architecture to automate the control of a wheel loader.**

**IP Status:** Provisional Patent Application Filed

## Applications

- Control of an automated wheel loader or other off-road vehicle

## Technology Overview

Currently, a human driver controls both the drive and work functions of a wheel loader, which often results in high fuel consumption or low productivity. Researchers at the University of Minnesota have developed a new control system architecture for automated wheel loaders. This technology ensures autonomous operation of the engine in providing the required power for both the drivetrain and work circuit in real-time. By systematically coordinating the drive and work functions, the control system can provide more than 20% energy benefits while maintaining productivity.

## Phase of Development

**TRL: 5-6**

Simulation is completed. Hardware-in-the-loop test is being carried out.

## Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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## Researchers

- [Zongxuan Sun, PhD](#) Frank Rowley Professor, Department of Mechanical Engineering

## References

1. Zhao G, Edson CP, Yao J, Sun Z, Stelson KA, <https://doi.org/10.1177/09544070231188772>, <https://journals.sagepub.com/doi/abs/10.1177/09544070231188772>

## Technology ID

2023-008

## Category

Software & IT/Algorithms  
Software & IT/Simulation & Modeling  
Software & IT/Transportation

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