UCONN RESEARCH

# A METHOD FOR MINIMUM POWER LOSS AND MAXIMUM EFFICIENCY OPERATION IN MOTOR DRIVES USING BEHAVIORAL MODELING

Case # 16-026

**Background:** Electric motor drive systems are commonly used in many areas of operation due to their flexibility and reliability. However, these systems consume large amounts of electricity. Improvements in operating efficiency has the potential to reduce required electrical energy usage, thus providing both environmental and cost savings benefits.

## The Technology: Systems and methods of optimizing operation efficiency of a motor drive

The technology encompasses methods and systems of optimizing the efficiency of a motor drive or generator. The methods include measuring data corresponding to input power and output power of a motor drive or generator at a control parameter and different load values. The methods include generating a three-dimensional surface model based on the measured data. The three-dimensional surface model can estimate an efficiency of the motor drive or generator at the control parameter and at unmeasured load values. The methods can include determining optimal efficiency of the motor drive or generator at the different load values and the unmeasured load values based on the three-dimensional surface model.

## Commercial Applications:

- Commercial and residential HVAC systems
- Transportation systems
- Industrial manufacturing processes

## Advantages:

- Comprehensive method that includes all possible motor drive losses
- Improved accuracy in determining system energy consumption
- Improved modeling of drive efficiency has the potential to support product development, optimal efficiency control, and better system sizing

## Stage of Development:

- Laboratory demonstration

## Intellectual Property Information:

- Non-provisional patent application 05/25/17. Publication Number US20170346433A1.

## Related Publications:


- Ulatowski J et al. (2015). Behavioral comprehensive efficiency modeling of motor drive systems based on physical measurements. IEEE Energy Conversion and Congress Exposition (ECCE).


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