

# Data Fusion to Improve the Accuracy of Traffic Counts

## Technology Transfer Activities

by

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## TECHNOLOGY TRANSFER ACTIVITIES

### 1 Outputs

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The project outputs include one dissertation, one poster session, and thousands of vehicle images used to train the convolutional neural network (CNN).

#### 1.1 Output #1

Qu, Xianshan. Deep Learning based Models for Classification from Natural Language Processing to Computer Vision. Dissertation, 2021, University of South Carolina.

#### 1.1 Output #2

Poster entitled “Construction of a Large Dataset for Daytime and Nighttime Vehicle Classification” presented at the C2M2 3rd Annual Fall Conference, Clemson, SC (October 18, 2019).

#### 1.1 Output #3

Labeled vehicle images based on their classifications. These images can be used by the research community to train their CNN models. They can be made available upon request.

### 2 Outcomes

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The project outcomes include the training of a Ph.D. and a M.S. student in developing image processing algorithms to classify vehicles from video data, the use of thermal imaging data to enhance the classification of vehicles at night, and the data fusion approach to enhance counting and classification accuracy.

#### 2.1 Outcome #1

Training of Ph.D. student Xianshan Qu and M.S. student Quentin Eloise.

#### 2.2 Outcome #2

Thermal imaging data (samples shown below) are demonstrated to enhance vehicle classification at night.



### 2.3 Outcome #3

Development of data fusion method involving thermal imaging data and pneumatic tube data to provide more accurate classification compared to either method when used by itself.

### 3 Impacts

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The project impacts include the potential adoption of collecting thermal data for vehicle classification at night by the South Carolina Department of Transportation (SCDOT).

#### 3.1 Impact

The SCDOT purchased a trailer to support the deployment of a thermal imaging video recorder for use in future vehicle classification efforts.