The *TranLIVE Spotlight* is a bi-weekly update from the University Transportation Center research collaboration led by the University of Idaho

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IMPROVING IMAGE-BASED VEHICLE DETECTION TO BETTER IDENTIFY EMISSIONS IMPACT

MOSCOW, Idaho – Using video surveillance from the Virginia Department of Transportation (VDOT), TranLIVE researchers from Virginia Tech University, Jeffrey B. Flora, Mahbubul Alam, Amr H. Yousef, and Khan M. Iftekharuddin have successfully developed an algorithm pipeline which can detect, track, segment, and classify vehicles. Future use of these results may pave the way for exploration into the impact of specific vehicle types on carbon emissions in individual transportation networks.

The algorithm pipeline analyzed sped up and reduced offline video sequences and identified vehicles before evaluating the vehicle features and segmenting each vehicle into six different classes: a sedan, a passenger truck/SUV, a motorcycle, a bus, a long-haul truck, or a short haul truck.

Due to significant appearance variation across different vehicle makes and models, the team applied a sequence of morphological operations, including a compiled collection of similar morphological features related to each vehicle type, as means of eliminating excess 'noise' in the videos which could misidentify vehicles and skew results.

Upon testing the algorithm pipeline, the researchers found their multiclass classification demonstrated an average accuracy rate of 85%. While under the ideal conditions of light traffic, strong light, and light shadows, the algorithm produced minimal errors in identification. Though not-so-ideal conditions: blurry video, poor video angle, poor lighting, strong shadows, heavy traffic, inclement weather, and low image resolution, have left room for future studies to improve upon image-based vehicle identification.

The complete report is available at: bit.ly/**tranlive11172014**

ABOUT TRANLIVE UNIVERSITY TRANSPORTATION CENTER
TranLIVE is the Transportation for Livability by Integrating Vehicles and the Environment a research collaboration lead by the University of Idaho in partnership with Old Dominion University, Syracuse University, Texas Southern University, and Virginia Polytechnic Institute and State University. TranLIVE works to find solutions to transportation challenges that minimize environmental impacts while educating students to enter the transportation workforce and creating and transferring tools and knowledge to practicing transportation professionals. TranLIVE is sponsored by the United States Department of Transportation (USDOT) University Transportation Centers Program. For more information visit: **www.tranliveutc.org**