TempURRA-NET With Lane.EV: A Novel Lane Detection Architecture With Enhanced Reproducibility Through the Lane.EV Evaluation Platform

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In 2019 alone, there were reportedly over thirty-thousand driver related deaths and over three-million driver related injuries. Interestingly, over 60% of these deaths and around 200,000 of these injuries could have been prevented with some type of advanced driver assistance system (ADAS) onboard. Lane detection, a critical component of ADAS technology, aims to accurately identify road lane boundaries from camera or other inputs to enable functions like lane keeping assistance and autonomous navigation. However, existing state-of-the-art lane detection models still struggle in challenging real-world conditions such as temporary occlusions, changing environments, and complex urban scenarios. This project presents TempURRA-NET, a novel neural network architecture that integrates a backbone-supported U-NET with iterative refinement, recurrent components, and temporal data handling to enhance lane detection robustness, consistency, and prediction stability. Additionally, to address the lack of reproducibility and access to easy model evaluation in this field, Lane.EV was created: a standardized model evaluation platform that streamlines the testing process of lane detection and computer vision models. TempURRA-NET achieves a max average accuracy of ~98% on the TuSimple benchmark, outperforming previous SOTA methods while Lane.EV ensures the reproducibility and sustainability of these results.

Awards Won: