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NEWS RELEASE

Visteon ADAS expert presents visual odometry alternative at computer vision conference

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Experiencing unprecedented interest and exposure at its 2018 edition, the European Conference on Computer Vision (ECCV) welcomed more than 3,000 participants through its doors in Munich, Germany, from September 8-14. With the wide-ranging biennial event incorporating workshops, tutorials and poster sessions, Visteon contributed to the in-depth discussion with a focused talk on visual odometry (VO).

Representing the company at the city's historic Gasteig center, Niclas Zeller, ADAS software developer, delivered a presentation on his **white paper**, entitled: "Scale-Awareness of Light Field Camera-based Visual Odometry."

Niclas explored scale-optimized plenoptic odometry (SPO) - a completely direct VO algorithm. The algorithm works directly on the raw images recorded by a focused plenoptic camera, reliably tracking the camera motion and establishing a probabilistic semi-dense 3-D point cloud of the environment. This simultaneously obtains the absolute scale of the camera trajectory and the scale of the 3-D world. The image below demonstrates a 3-D map calculated by the algorithm.

In the paper, Niclas proposes a novel direct VO algorithm for micro-lens-array-based light field cameras. The algorithm calculates a detailed, semi-dense 3-D point cloud of its environment. This is achieved by establishing probabilistic depth hypotheses based on stereo observations between the micro images of different recordings. Tracking is performed in a coarse-to-fine process, working directly on the recorded raw images. The tracking accounts for changing lighting conditions and utilizes a linear motion model to be more robust.

Niclas' proposed scale optimization framework estimates the scene scale on the basis of key frames and optimizes

the scale of the entire trajectory by filtering over multiple estimates. The method is tested based on a versatile dataset consisting of challenging indoor and outdoor sequences and is compared to state-of-the-art monocular and stereo approaches. The algorithm shows the ability to recover the absolute scale of the scene and significantly outperforms state-of-the-art monocular algorithms with respect to scale drifts.

Other main topics at ECCV 2018 investigated computational photography human analysis and sensing, matching and recognition and learning for vision. A diverse series in excess of 50 oral sessions was led by auto industry experts, analysts, academics and representatives from major technology players including Facebook, Intel and Google.

The conference enjoyed a greater than 100 percent increase in attendance levels from its previous edition in 2016.