

Dickmanns 2015: **BarVEye: Active gaze control for autonomous driving**

**Abstract:** With the capability of autonomous driving for road vehicles coming closer to market introduction a critical consideration is given to the design parameters of the vision systems actually investigated. They are chosen for relatively simple applications on smooth surfaces. In the paper, this is contrasted with more demanding tasks human drivers will expect to be handled by autonomous systems in the longer run. Visual ranges of more than 200 m and simultaneous fields of view of at least 100° seem to be minimal requirements; potential viewing angles of more than 200° are desirable at road crossings and at traffic circles. Like in human vision, regions of high resolution may be kept small if corresponding gaze control is available. Highly dynamic active gaze control would also allow suppression of angular perturbations during braking or driving on rough ground. A 'Bifocal active Road Vehicle Eye' (BarVEye) is discussed as an efficient compromise for achieving these capabilities. For approaching human levels of performance, larger knowledge bases on separate levels for a) image features, b) objects / subjects, and c) situations in application domains have to be developed in connection with the capability of learning on all levels.