Keynote Speech IV

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Smart Vehicles for a Smart City

Abstract: The talk reports about two imminent revolutions in the automotive history which will define the on-road traffic in the smart city of the near future. Both revolutions are already starting to happen, and those cities which will prepare for their event will make the best possible use of them. The first revolution is the replacement of the manually steered vehicle by increasingly autonomously driving vehicles while driving on densely populated roads. Examples of goals are here to go towards zero-accident traffic and a more efficient use of existing road systems. Dense and autonomous traffic will reduce the need for additional roads, and avoid traffic jams by ensuring a steady flow of traffic. The second revolution is the replacement of gasoline powered vehicles by electric cars. Electric cars are completely emission free if charged from renewable energy sources; they also drive silent at low speeds, have significantly cheaper running costs, and also significantly cheaper servicing cost. Autonomous driving and electric vehicles will come, earlier or later, and both developments can benefit from smart city infrastructure projects for supporting their introduction. The talk reports about advances towards autonomous driving, and a city-wide study about the introduction of electric cars in Perth, Western Australia. The talk is coauthored by Prof. Thomas Braeunl, The University of Western Australia.

Short Bio: Professor Reinhard Klette is a Fellow of the Royal Society of New Zealand. He is the director of the newly established Centre for Robotics & Vision at the Auckland University of Technology, New Zealand. He has been working in the area of computer vision for more than 30 years. In 2003 he published with the late Professor Azriel Rosenfeld of University of Maryland, USA, the first comprehensive monography on digital geometry (published by Morgan Kaufmann, San Francisco). He has become internationally renowned for his work in vision-based driver assistance since 2006, with important contributions on performance evaluation and improvements of correspondence algorithms (for stereo matching and optical flow) on real-world video data, supporting, for example, 3D scene reconstruction from a mobile platform.

In 2008 he co-authored (with two of his former PhD students) a research monograph on panoramic vision (with Wiley, UK), and in 2011 a research monograph (also co-authored with a former PhD student) on shortest paths in Euclidean spaces (with Springer, UK). His book entitled “Concise Computer Vision” has been published by Springer, London (UK), on 5 January 2014. By end of August 2015, the number of downloads of e-copies of this book, or parts of it, from Springer’s website has crossed the 25,000 mark. This is an exceptional high number for any computer science textbook published by Springer.

Since 1995 he has been invited as a keynote or plenary speaker to international conferences worldwide. Between April 2011 and October 2013 he has been the founding Editor-in-Chief of the Journal of Control Engineering and Technology (JCET). He was an Associate Editor of IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) between 2001 and 2008, which is a top-ranked journal in all engineering and computer science disciplines. He is a life-time honorary steering committee member of the biennial conferences on Computer Analysis of Images and Patterns, taking place in Europe, and a steering committee member of the Pacific-Rim Symposium on Image and Video Technology. Professor Klette supervised already 25 PhD students to the successful completion of their PhD program.