

Development of Lane-Level Guidance Service in Vehicle Augmented Reality System

Jeong-Woo Lee, Chang-Rak Yoon, Jungyu Kang, Byoung-Jun Park, Kyong-Ho Kim

Industries IT Convergence Department

Electronics and Telecommunications Research Institute, Korea

jeow7@etri.re.kr, cryoon@etri.re.kr, cmiller2air@etri.re.kr, bj_park@etri.re.kr, khh@etri.re.kr

(Pt9)Abstract—A driver should always pay attention to various situations which he faces inside and outside the car while driving and always keep eyes forward for safe driving. A vehicle augmented reality system provides the driver with safe and convenience information which matched with the real world through HUD. It makes the driver keep eyes forward road and other cars. We have developed the vehicle augmented reality system and various services and tested them on an indoor testbed. This system provides driver with the forward situation awareness service, the lane change service, the lane departure service and so on displayed as the vehicle augmented reality. We describe the development contents and results of the developed vehicle augmented reality system focused on the lane-level guidance technology which determines the lane change or the lane departure using route information, road properties, the driving lane information, position, and so on.

(Pt9)Keyword—vehicle, augmented reality, lane change, lane departure, route guidance

Jeong-Woo Lee is a senior researcher of the Human–Vehicle Interaction Research Center, Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea. He received his BS and MS degrees in computer engineering from Sungkyunkwan University, Suwon, Rep. of Korea, in 1999 and 2001, respectively. Since 2001, he has been with ETRI. His current research topics include intelligent vehicles, V2V, V2I, head-up displays, and augmented reality applications in vehicles.

Chang-Rak Yoon is a principal researcher of the Human–Vehicle Interaction Research Center, Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea. He received his MS degrees in computer science from Kyungpook National University, Daegu, Rep. of Korea, in 1996. Since 1995, he has been with ETRI. His current research topics include intelligent vehicles, human–computer interaction, head-up displays, and augmented reality applications in vehicles.

Jungyu Kang is a researcher of the Human–Vehicle Interaction Research Center, Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea. He received his BS and MS degrees in electronic engineering from Korea Advanced Institute of Science and Technology, Daejeon, Rep. of Korea, in 2012 and 2014, respectively. Since 2014, he has been with ETRI and his current research interest include augmented reality, machine learning, computer vision and deep learning.

Byoung-Jun Park is a senior researcher in ETRI, Daejeon, Rep. of Korea. He received his BS, MS, and PhD in control and instrumentation engineering from Wonkwang University, Iksan, Rep. of Korea, in 1998, 2000, and 2003, respectively. From 2005 to 2006, he was a postdoctoral fellow in the Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, Canada. Since 2008, he has been with ETRI. His current research topics include forward situation awareness service, human–computer interaction, head-up displays, and augmented reality applications in vehicles.

Kyong-Ho Kim is a principal researcher and director of the Human–Vehicle Interaction Research Center, Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea. He received his BS and MS degrees in electronic engineering from Kyungpook National University, Daegu, Rep. of Korea, in 1993 and 1995, respectively, and his PhD degree in computer science from the Korea Advanced Institute of Science and Technology, Daejeon, Rep. of Korea, in 2010. Since 1994, he has been with ETRI. His current research topics include intelligent vehicles, human–computer interaction, head-up displays, and augmented reality applications in vehicles.