

Jury Report

Martinus van Marum Award 2022 – Engineering Sciences

Dr. ir. V.S. (Victor) Dolk

Resource-aware and Resilient Control with Applications to Cooperative Driving

Eindhoven University of Technology, November 2017

The jury for the Martinus van Marum Award 2022 is very pleased to announce Victor Dolk as the winner. Victor was granted the PhD degree cum laude for his thesis on Resource-aware and resilient control with applications to cooperative driving, at the Mechanical Engineering department of TU Eindhoven.

Victor Dolk provided a completely novel perspective on the control of interconnected systems using (wireless) communication networks, including applications such as vehicle platoons to enhance traffic flow, safety and fuel economy. He proposed to abandon the classical time-triggered control schemes in which sensing and actuation actions are executed periodically in time at a fixed rate. Instead, he developed a novel engineering design framework for event-triggered control schemes, being a resource-aware control paradigm in which control and sensing actions are triggered by well-designed events involving the system's state, output or any other locally available information. He provided rigorous mathematical results on the analysis and design of these systems giving guarantees on the stability, performance and robustness to communication delays, packet losses and malicious jamming attacks. Moreover, he validated his scientific findings experimentally on a platoon of cars equipped with Cooperative Adaptive Cruise Control (CACC), which is a promising cooperative driving system to reduce fuel consumption and to improve safety and traffic throughput.

His promotors at TU Eindhoven describe Victor as an exceptionally independent, innovative and bright researcher and they recommend his research approach for its sophistication, elegance and practical applicability. Victor has been exceptionally productive in terms of publications, many of which are highly cited, and already distinguished himself as the recipient of the European PhD award on control for complex and heterogeneous systems. Last but not least, the jury noted his efforts in knowledge dissemination and outreach to society at large, among others as co-founder of a student team which participated in the Grand Cooperative Driving Challenge.

We wholeheartedly congratulate Victor Dolk as the winner of the Martinus van Marum Award 2022!

Prof. dr. ir. M.G.D. (Marc) Geers, hoogleraar mechanics of materials TU Eindhoven

Prof. dr. ir. M.P.C. (Margot) Weijnen, hoogleraar proces- en energietechnologie TU Delft, lid raad van bestuur NWO, voorzitter NWO domein Toegepaste en Technische Wetenschappen

The meeting of the jury took place on March 18th, 2022, was chaired by KHMW-director Mr. drs. T.S.M. (Thérèse) van Schie and was also attended by Prof. dr. A.P. (Ad) IJzerman, Secretary of Natural Sciences KHMW and Drs. S. (Saskia) van Manen, Secretary KHMW (minutes).