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TU/e Technische Universiteit **Eindhoven** University of Technology

Inaugural lecture
Prof.dr.ir. Frank Willems
March 24, 2017

/ Department of Mechanical Engineering

TU/e Technische Universiteit **Eindhoven** University of Technology

# The self-learning powertrain

## towards smart and green transport

**Where innovation starts**

**Prof.dr.ir. Frank Willems was appointed part-time professor of Integrated Powertrain Control at the Department of Mechanical Engineering of Eindhoven University of Technology on January 1, 2016. He will deliver his inaugural lecture on March 24, 2017.**

Frank Willems gained his MSc and PhD degrees in Mechanical Engineering from Eindhoven University of Technology (TU/e), in 1995 and 2000, respectively. Subsequently, he joined the Powertrains group of TNO Automotive, where he is currently a senior technical specialist in powertrain control. He has been involved in various industrial research projects on clean engine technologies. Since 2007, he has been a part-time staff member at the Control System Technology group, Department of Mechanical Engineering at TU/e in various roles. Following his Assistant and Associate Professorships, he currently holds a position as part-time full professor in this group. His main research interests are modeling of internal combustion engines and aftertreatment systems, cylinder pressure-based combustion control, and integrated powertrain control.

## About the lecture

Powertrain control systems are the brains of the combined engine and drivetrain. These electronic control systems give the powertrain a specific feel and its characteristics, in terms of torque response, fuel consumption and emissions. Driven by current, societal concerns about global warming and energy security, dramatic reductions in fuel consumption and a transition towards renewable fuels are required. This sets challenging requirements for future powertrain control systems. Questions like the following arise. How can we guarantee minimal fuel consumption and tailpipe emissions, adapt to varying, real-world operating conditions, and exploit the available preview information? The self-learning powertrain seems the inevitable way to go.
In this lecture, Frank Willems presents his vision on control systems for future heavy-duty powertrains. The focus is on long-haul truck applications. He follows an integrated system approach, based on physics-based modeling, which is characterized by on-road energy and emission trading. For his applied, multi-disciplinary research, close collaboration with connected research fields and with research institutes and industry is key.

# Invitation

The Executive Board of Eindhoven University of Technology cordially invites you to attend the inaugural lecture of Prof.dr.ir. Frank Willems on **Friday, March 24, 2017, at 4.00 PM**. The public lecture will be delivered in the Blauwe Zaal of the Auditorium. You do not need to register.

The lecture concerns
**'The self-learning powertrain: towards smart and green transport'**

After the lecture, drinks will be served in the Senaatszaal.

All full professors are invited to join the cortège. If you want to join the cortège, please register in advance with the P&P office which organizes all academic ceremonies, telephone +31 (0)40 247 33 02, e-mail: penp@tue.nl.

**Prof.dr.ir. F.P.T. Baaijens**
Rector Magnificus

After March 24, 2017, the text of the inaugural lecture will be available online at www.tue.nl/lectures.