



OPUS

College of Engineering

MARQUETTE UNIVERSITY

Department of Electrical and Computer Engineering  
Colloquium

Tuesday, January 22, 2019

2:00 – 3:00 pm

*with reception and refreshments from 3:00 – 3:30pm in Room 252*

***Title:* Engineering Efficient Electric Vehicles**

**\*\* NEW LOCATION \*\***  
Engineering Hall Room  
236  
1637 W. Wisconsin Ave.  
Milwaukee, WI 53233



**Dr. Patrick Groeneveld**

Distinguished Engineer at Cadence Design Systems &  
University Lecturer at Stanford University

**ABSTRACT:**

The advanced technology that drives the new generation of electric vehicles will be presented. Based on Newtonian physics and electrical engineering we will analyze motor efficiency, performance, battery parasitics and manufacturing cost. By comparing that to gasoline-powered cars we can present a unique science-based foundation for a sound economical and environmental transportation policy. The full well-to-wheel cost and emissions of all propulsion options will be thoroughly analyzed for a fact-based trade-off. We will show that the results are much more nuanced than the polarized information from either side of the political debate on climate change. For instance: most do not realize that battery-powered vehicles experience a 40% drop in range in cold weather. That makes an EV less suitable for Wisconsin winters. Despite this we expect that battery-powered vehicles will quickly become very popular due to many other redeeming qualities.

## BIO:

Before working at Cadence and Synopsys, Patrick Groeneveld was Chief Technologist at Magma Design Automation where he was part of the team that developed a groundbreaking physical synthesis product. From 2001 until 2005, he was Full Professor of Electrical Engineering at Eindhoven University. Patrick is currently teaching at Stanford University and is also the finance chair of the Design Automation Conference. He received his MSc and PhD degrees from Delft University of Technology in the Netherlands. In his spare time Patrick enjoys flying airplanes, running, tinkering and reading useless information.



**For more information, call the EECE department office at (414) 288-6820**

*Open to the public, with reception and refreshments from  
3:00 – 3:30pm in Rm. 252*

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