

Univ.-Prof. Dr.-Ing.

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### Career:

- Since 2004: **Chair and Director**, Institute for Autonomous Systems Technology, University BW Munich (UBM).
- 2007-2009: Vice-Chairman, as of Dec. 2007: **Chairman of the Board** of AGOR AG, Cologne, Germany. AGOR AG is the European market-leader in recycling aluminium salt slags for the aluminium industry with several plants in Germany and Canada
- Since Nov. 2006: Member Executive Board then **Extended Board**, Excellence Cluster “CoTeSys” (Cognition for Technical Systems”, at the Technical University (TU) Munich
- Since Jan. 2006: **Executive Officer**, DFG Research Center “Cognitive Automobiles”, in collaboration with the TU Munich and the TU Karlsruhe  
Program Chair and Session Lead at a variety of international conferences such as the biannual International Conference on Advanced Driver Assistance Systems
- 2001 – 2004: **Vice President Operations Europe**, Pentair Enclosures Group. Pentair Inc. (NYSE: PNR) is a \$3bn diversified industrial company headquartered in Minnesota, USA. Responsible for six operations in Europe with up to 1400 employees. Closed three operations and established a new operation in Qingdao, China. Established lean management and lean operations structures; initiated up to 140 “KaiZen” events per year, leading to substantial lead-time reductions, and significant delivery and working capital improvements.
- 2003 – 2004: **CEO and President, Operation Betschdorf, France**. Initiated a management change at the second most important operation in Europe and led this operation until a replacement was found more than 1 year later.
- 2000 – 2006: **Member of Board of Directors**, Euromed AG, Nuremberg, Germany, an innovative health-services group.
- 1998 – 2001: **VP Marketing & Business Development**, Pentair Enclosures Group. Moved to Minneapolis, MN, USA. Responsible for Global Strategy and M&A, led several acquisitions between \$10m and \$460m in North and South America (Brazil).
- 1994 – 1998: **Managing Director**, Schroff UK Ltd., Pentair subsidiary. With 140 employees responsible for manufacturing and sales in the UK.
- 1992 – 1994: **VP Mechanical Division** at Schroff GmbH, resp. for 500 employees. Schroff is the world market leader in 19” electronic enclosures. Acquired by Pentair, Inc. in 1994
- 1987 – 1991: **Director Engineering and Operations**, Industrial Automation Division of MBB (was DaimlerChrysler Aerospace, now EADS). Three product ranges: robotic assembly systems, 3D laser welding systems and flexible AGV (automated guided vehicle) systems.

## **Education:**

- July 1987: Doctor of Engineering degree, UBM. Doctoral Thesis: "Bewegungssteuerung durch Rechnersehen" ("Controlling Motion through Computer Vision"). Published by Springer, 1988.
- 1982-1987: Doctoral Student with Prof. Dr.-Ing. E.D. Dickmanns, Institute for Systemdynamics and Flightmechanics, UBM. Co-Developed the 4D-Approach to Dynamic Machine Vision, worldwide considered today as a standard in this field.
- May 1982: Master of Science in Engineering Degree, University of Texas at Austin, USA
- 1980 – 1982: Fulbright scholar at the University of Texas at Austin (USA). Graduate student in Aerospace Engineering and Mechanics, with focus on Digital Control.
- 1977 – 1980: Undergraduate student in Electrical Engineering, Technical University Munich.

## **Research Work and Interests:**

We focus on developing autonomous road and air vehicles, where the computer controls throttle, brakes and steering.

In the past our institute has developed world record braking "seeing" autonomous vehicles such as "VaMoRs", which in 1986 drove autonomously 20km at full speed on a new, not yet opened highway, or "VaMP", a Mercedes 500 SEL sedan, which from 1994 to 2004 drove autonomously ten-thousands of km in normal traffic on public German Autobahns.

The most spectacular drive was an autonomous drive from Munich to Denmark in 1995 at speeds up to 180 km/h even changing lanes to overtake slower vehicles; on these drives several cameras observed the scene front and back, a computer took the video images 10 times a second and computed appropriate vehicle control inputs for steering, throttle and brakes, while the safety driver sitting on the drivers seat watched and made sure no problems arose; in less then 5% of the distance driven he had to intervene (construction sites, tunnels, etc.). Both cars are now at museums, "VaMP" at the "Deutsches Museum" at Munich.

We now have equipped our latest vehicle "MuCAR-3" ("Munich Cognitive Autonomous Robot Car, 3<sup>rd</sup> generation; a modified VW Touareg) with vision systems and a roof-top Lidar system, and continue our autonomous test drives both on roads as well as in off-road terrain. Together with a team from TU Munich and TU Karlsruhe we prepare for participation at this years US DARPA Urban Challenge event, where robot cars without any persons on board will race against each other in a closed off city environment, competing for a 2 Mio \$ price.

At the August 2007 C-Elrob offroad competition in Switzerland our vehicle MuCAR-3 finished fastest amongst several European teams in the "urban" and "non-urban" reconnaissance task; 90% of the very difficult mountain and forest track was driven fully autonomously.

## **Personal Data:**

- Hobbies: Skiing, mountain biking, classic cars, flying (private pilot with current IFR license)
- Honors: Member of Rotary International, Fulbright Alumni