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Career:

Since 2004:	**Chair and Director**, Institute for Autonomous Systems Technology, Aerospace Department, University BW Munich (UniBwM).
Since 2012:	Head of Research Center "MOVE" (Modern Vehicles) at UniBwM
March 2011:	Elected into the European Academy of Sciences and Art
Since Jan. 2011:	Elected by the German Research Foundation DFG into their **Senate Committee** for Graduate Schools (Graduiertenkollegs)
Nov. 2006-2012:	Member Executive Board then **Extended Board**, Excellence Cluster "CoTeSys" (Cognition for Technical Systems", at the Technical University (TU) Munich
2006-2009:	**Executive Officer**, DFG Research Center "Cognitive Automobiles", in collaboration with the TU Munich and the TU Karlsruhe
2007-2009:	Vice-Chairman, as of 12/2007: **Chairman of the Board** of AGOR AG, Cologne, Germ., a market-leader in recycling aluminium salt slags for the aluminium industry
Since 2008:	Program Chair, Session Lead and Associate Editor at a variety of international conferences dealing with Intelligent Vehicles or Advanced Driver Assistance Systems
2001 – 2004:	**Vice President Operations Europe**, Pentair Enclosures Group. Pentair Inc. (NYSE: PNR) is a $3bn(now $7bn) 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.
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 Daimler 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, UniBwM. Doctoral Thesis: “Bewegungssteuerung durch Rechnersehen” (“Controlling Motion through Computer Vision”). Springer, 1988.
1982-1987:	Ph.D. Student with Prof. Dr.-Ing. E.D. Dickmanns, Institute for Systemdynamics and Flightmechanics, UniBwM. 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 vehicles, where the computer controls throttle, brakes and steering. Our long term goal is to enable robots (and we see vehicles as robots) to perceive their environment and intelligently interact with it, thus giving them “cognitive capabilities”.

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 Autobahn, 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 on Autobahns 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 driver’s seat watched and made sure no problems arose; in less then 5% of the distance driven he had to intervene (construction sites, tunnels, etc.). Given almost 20 years of research and advances in technology, Google’s cars have really not shown much more than what was demonstrated back then. Both cars are now at museums, “VaMP” at the “Deutsches Museum” at Munich.

Since 2006 we are using our latest vehicle “MuCAR-3” (“Munich Cognitive Autonomous Robot Car, 3rd generation; a modified VW Touareg) and now MuCAR-4 (a VW Tiguan) with vision systems and a roof-top 3D Lidar system, concentrating on more challenging off-road driving.
Together with a team from TU Munich and TU Karlsruhe we participated as team AnnieWay at the 2007 US DARPA Urban Challenge, where robot cars without any persons on board raced against each other in a closed off city environment, competing for a 2 Mio $ price. Of more 89 teams we were one of only 11 teams, and one of only two non-American teams to make the finals.
With MuCAR-3 we participated at the 2007 to 2010 and 2012 ELRob (European Land Robot) trial events, finishing fastest of all teams in the autonomous off-road navigation events both in 2007 and 2009, second in the autonomous convoy event in 2008 and fastest at the 2010 and 2012 convoy and mule events. As a difference to the DARPA events the ELRob events take place in heavily wooded, often mountainous areas, where GPS outages are frequent and visual perception is tough.

Research spans vision and lidar based perception as well as navigation both for structured (road) and unstructured off-road environments. Moreover we have applied our vehicle perception and navigation strategies to humanoid robots, providing the vision system for the TU Munich humanoid robot Lola. With about all major German car manufacturers we work on next generation driver assistance systems.

Personal Data:

Hobbies:	Skiing, mountain biking, classic cars, flying (private pilot with current IFR license)
Honors:	Member of the European Academy of Sciences and Art Member of Rotary International; Fulbright Alumni