1st International ROBOTICIST FORUM
17-18 January 2019
FHWS, Schweinfurt

MOTION TAXONOMY

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Roboticist Forum

Robots are rapidly gaining in significance in the areas of industry, skilled trades, agriculture, health, medicine, research and private everyday life. It is likely that they will become established in all areas of work and life just like computers and that they will change the quality of our work and life. For years, the growth rates in the robotics industry have been in double figures and an end to this trend is not anticipated, especially in view of the continuous improvements to artificial intelligence. Therefore, companies are already desperately looking for robotics engineers and experienced staff to develop and integrate applied and intelligent robotics systems. This need can be met by universities of applied sciences (UAS) with an independent bachelor’s degree programme in Robotics which has been conceived from scratch.

Therefore, this forum seeks to discuss the new professional profile of the “roboticist” in a dialogue with experts which gives sufficient consideration to software aspects in particular, and thus to provide stimuli for the academic training.

At the Schweinfurt Roboticist Forum, FHWS invites the participants to discuss the requirements faced by future robotics engineers who are to bring robots into all kinds of areas of application as universal machines, as well as the needs of the real world. Representatives of business and industry, as well as representatives of interested Bavarian and non-Bavarian higher education institutions, are invited to the forum. Selected international partner higher education institutions are also invited to define the professional profile of the “roboticist” and thus to help to shape a bachelor’s degree programme in “Robotics”.

The internationalisation of degree programmes is an important issue which, in particular, simplifies student and lecturer exchanges and double or multiple degrees throughout the world, gives students basic skills for their future professional environment and also promotes cross-border collaboration in applied research. Therefore, FHWS intends to offer a German-language bachelor’s degree programme in robotics (“Robotik”), which will have an English language counterpart (TWIN Programme) with the title “Robotics”. This is to be established at international partner higher education institutions in the same form (World TWIN). With the introduction of a degree programme in Robotics at several Bavarian and German universities of applied sciences, this type of higher education institution can continue or consolidate its tradition as a factory for engineers and can thus also continue to gain in attractiveness.

Such a degree programme corresponds to two Bavarian interests and challenges: Digitalization and the promotion of software expertise in academic training. Furthermore, there is no degree programme anywhere in Germany that focusses extensively on the software aspects of robot programming and is simply called “Robotics”. And perhaps the roboticist has the same potential to be a success story in the area of robotics as the computer scientist does in the area of computer science.

The idea of having the professional profile of a robotics engineer, who puts robots into practice, discussed and established jointly by the Bavarian universities of applied sciences and universities of technology came about after a discussion in November 2018 at FHWS with Assistant Secretary Schoppik regarding the social tasks of our type of higher education institution and after the cooperation agreement between Shenzhen Technology University (SZTU) and five Bavarian universities of applied sciences was signed in Shenzhen Town Hall two days later.

We hope that this forum will contribute towards anchoring the professional profile of the robotics engineer in the world of work and shaping society’s perception of it with the term “roboticist”.

Robert Grebner  Jean Meyer  Tobias Kaupp
Block I
Mobile Robotics
Mobile robots transport or locate goods and persons or serve as technology carriers. In both cases, large distances or effective radii in unrestricted or unprepared environments present the greatest challenge. Appropriate technical systems and methods, such as autonomous navigation, mapping and path and motion planning are used to meet this challenge.

The open environment for mobile robots and their motion is not just restricted to land. Mobile robots can also move in the air, on water and under water. Progress in the development of algorithms, increased computing power and the availability of inexpensive sensors for determining position and for recognising the environment have given mobile robotics a huge boost in recent years and have led to mobile platforms increasingly also being used for tasks in a private sphere.

Block II
Service Robotics
The focus of service robotics is on the performance of partially and fully automated services for people and organisations. Service robots are characterised by a high level of interaction with their changeable but clearly defined environment, in which they work autonomously and interact with people.

The interaction with people takes place in areas where robots are entrusted with social tasks or provide support with these. This may be the case in fields such as the food service sector, the leisure industry or the healthcare sector. In nursing, for example, extremely complex motion tasks have to be solved in order to help a bedridden patient out of bed or into bed unharmed and according to the individual case.

Block III
Industrial Robotics
Industrial robots have been an integral part of the manufacturing industry since the 1970s at the latest. It is no longer possible to imagine any production line in the automotive industry without them. Use of these robots has made a significant contribution to the increase in productivity, making them an indispensable tool for modern industrial countries.

A fast-growing branch of industrial robotics is collaborative robots (so-called co-bots), which are equipped with innovative interaction capabilities. Their ability to collaborate with one another, with other machines and with people will open up a range of new areas of application.

With collaboration, the issue of “vision” is increasingly coming to the fore. Visual perception via optical sensors gives the industrial robots, which are actually “blind”, the ability to dynamically adapt their motion directly to altered environmental conditions and to perform sophisticated visual inspection tasks.

Block IV
Humanoid Robotics
Humanoid robots are characterised by kinematics based on the human locomotor system. A major challenge is controlling several axles at the same time for the hands, arms and legs. Walking upright is a specific function which does not occur in other types of robots. Another challenge is replicating the cognitive abilities of a human.

The handling effort is much higher for humanoid robots than for other types of robot. The humanoid robots which are currently available are far from having the physical and mental capacity of a human, even though there are promising developments in some functional areas.

It is anticipated that artificial machine intelligence will constantly continue to develop in the coming years. The developments in this field will dramatically extend the areas of application not only for humanoid robots, but also for all other types of robot.

The humanoid robot has many aspects and facets which we would like to feature at a subsequent 2nd International Roboticist Forum. Therefore, it is not a focus of this 1st Roboticist Forum.
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<td><strong>17 January 2019, Schweinfurt</strong></td>
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| 09:00 - 09:30 | Welcome: Prof. Dr. Robert Grebner  
President of the University of Applied Sciences Würzburg-Schweinfurt (FHWS) |                                                                                                                                         |
| 09:30 - 10:00 | Driving the Digital Enterprise  
Ralf-Michael Franke  
CEO Business Unit Factory Automation (FA)  
Digital Factory Division (DF) Siemens AG, Nuremberg |
| 10:00 - 10:15 | Practical Areas of Application of Telepresence Robots - Human-Robot-Robot Interaction  
Prof. Dr. Nicholas Müller  
FHWS - Professor of Social Informatics |
| 10:15 - 10:30 | Possible Applications of Social Robots  
Prof. Dr. Dagmar Unz  
FHWS - Dean of the Faculty of Applied Social Sciences (FAS) |
| 10:30 - 10:45 | Autonomous Flying Robots  
Dr. Nils Gageik  
Managing Director of Emqopter GmbH |
| 10:45 - 11:00 | Coffee break                                                                                                                                  |
| 11:00 - 13:00 | Workshop I  
Mobile Robotics                                                                                                                          |
| 13:00 - 14:00 | Lunch                                                                                                                                 |
| 14:00 - 15:00 | Digitalization and the Job Market: Are Intelligent Machines Taking Our Jobs?  
Prof. Dr. Ulrich Walwei  
Director of the Institute for Employment Research (IAB) |
| **18 January 2019, Schweinfurt** |                                                                                                                                         |
| 09:00 - 09:30 | Chinese Market for Robotics  
Prof. Dr. Qitao Lue  
Dean at the Sino-German College of Intelligent Manufacturing of Shenzhen Technology University  
Executive Vice President and Chief Technology Officer  
Han’s Laser Technology Industry Group Co., Ltd., Shenzhen, China |
| 10:00 - 10:15 | Coffee break                                                                                                                                  |
| 10:15 - 12:30 | Workshop III  
Industrial Robotics                                                                                                                       |
| 12:30 - 13:30 | Lunch                                                                                                                                 |
| 13:30 - 14:30 | Summary of the professional profile and definition of a roboticist made in Bavaria by universities of applied sciences |
| 14:30        | End of the event                                                                                                                            |
**PARTICIPANTS**

**Prof. Dr. Arndt Balzer** has taught at the Faculty of Computer Science and Business Information Systems at FHWS since 2008 in the area of computer engineering. His research focuses on so-called smart systems. These include systems which can be made smart with the help of sensors and actuators as well as the corresponding software. In his laboratory, he operates (partially) autonomously moving and flying platforms.

**Dr. Andreas Bley** is the Managing Director of MetraLabs GmbH New Technologies and Systems based in Ilmenau. The company develops, produces and implements professional mobile robots for the retail sector, especially for transport, stocktaking and as guides. Dr. Bley studied Industrial Engineering, specialising in automation technology, and did his doctoral degree in the field of economics at the Friedrich Alexander University of Erlangen-Nuremberg with a grant from the Germany Business Foundation.

**Prof. Dr. Chi Chiu Chan** received his bachelor’s degree (1st class honours) in 1996 and his doctorate in 2000 at the Department of Electrical Engineering at Hong Kong Polytechnic University. From 2000 to 2003, he was a postdoc at the Department of Electrical Engineering at Hong Kong Polytechnic University. He was an assistant professor at the School of Electrical and Electronic Engineering at Nanyang Technological University in Singapore and was promoted to tenured associate professor at the School of Chemical and Biomedical Engineering at Nanyang Technological University in Singapore in 2003 and 2010. He has been a distinguished professor at the Sino-German College of Intelligent Manufacturing of Shenzhen Technology University, China, since 2017. His fields of research are optical fibre sensors, fibre Bragg grating, chemical sensors for fibre optics, fibre-optic biosensors and smart structures; his achievements in these areas can be seen in his 170 SCI journals and 5 patents. His research papers have been cited more than 2500 times; he has an h-index of approximately 30. He has been appointed an associate editor of the IEEE Sensors Journal and the Journal of Sensors and is a senior member of the IEE, a senior member of the IES, a member of the OSA and a life member of the SPIE. He has recently been awarded a number of titles: Shenzhen Overseas High-Caliber Personnel (Level B), Pengcheng Distinguished Scholar, Fellow of Hong Kong Institution of Engineers (FHKIE) and Fellow of the Society of Operations Engineers (FSOE), UK.

**Dr. Nils Einecke** did his doctoral degree at Ilmenau University of Technology in the field of real-time capable stereo image processing in 2012. Since 2007, he has worked at the Honda Research Institute, where he has led various research projects. The focuses of his research include stereo image processing, visual odometry and obstacle avoidance, outdoor localisation, embedded programming and efficient algorithms. On the basis of this expertise, he has made a decisive contribution towards the realisation of a prototype of an autonomous lawn mower with visual obstacle avoidance.

**Viktor Ewert** has been the Business Development Manager for Robotics at Schneider Electric in Marktheidenfeld since January 2016. Before that, he was employed at Bosch Rexroth AG in Lohr am Main for 8.5 years in various positions in the machine tool industry and at IMAK GmbH in Ingolstadt for 1.5 years as a systems engineer. In the period between 2001 and 2005, he studied Electrical Engineering, specialising in “automation and robotics”, at the University of Applied Sciences in Fulda, graduating with the qualification “Dipl.-Ing. (FH)”. 
PARTICIPANTS

Ralf-Michael Franke
CEO of Factory Automation
Born on 21 April 1958 in Hildesheim
Professional career
After studying Electrical Engineering at the University of Kassel, Ralf-Michael Franke joined Siemens in Erlangen in 1985, starting with the development of drive technology, followed by various tasks in the PLM process at the electronics manufacturing plant in Erlangen.
In 1998, he became Head of Quality Assurance, and in 2000 he took on the coordination of the cross-business unit development of the new drive platform SINAMICS.
As of 2003, Franke has managed the top+ programme for innovation in Munich.
In 2004, Ralf-Michael Franke became CEO of the Siemens Industrial Automation Systems Business Unit.
In April 2011, he became Head of the Drive Technologies Division.
Since October 2014, Ralf-Michael Franke has presided over the Factory Automation Business Unit. The Factory Automation Business Unit (Nuremberg) provides a comprehensive range of automation products and systems for all sectors of the manufacturing industry. The portfolio also includes customer-specific designs and turnkey logistics and manufacturing plants. Factory Automation is shaping the global automation technology market as a market leader and is a clear trendsetter.

Dr. Nils Gageik completed his studies in Computer Engineering at RWTH in Aachen in 2010 with a diploma. From 2010 to 2016, he was a research assistant to the Chair of Aerospace Computer Science at the University of Würzburg and completed his doctoral degree summa cum laude on the subject of “autonomous quadrocopters for indoor exploration”. In 2014, Dr. Gageik received the University Sponsorship Award of the Main-Franconian Economy and in 2016, he received the Faculty of Computer Science Prize and the Lower Franconian Memorial Year Foundation Prize. From 2016 to 2017, Dr. Gageik was an Exist grant holder. In 2016, he founded the company Emqopter, which he has managed ever since as the Managing Director.

Markus Gast has worked at WAREMA Renkhoff SE since 2003. He is responsible for the areas of production technology, maintenance and plant procurement at the company. In particular for new technologies and innovations.

Tamara Gelpke has been Head of Industrial Engineering for Ball Bearings at Schaeffler Technologies in Schweinfurt since 2018. From 2015 to 2017, she was Head of Industrial Engineering at the Ellershausen plant. From 2010 to 2015, she was Head of Industrial Engineering in the wheel bearings segment in Schweinfurt (Schaeffler Technologies). Before that, she worked for 3.5 years as a specialist in the development of manufacturing processes, also at Schaeffler Technologies. Ms Gelpke received her diploma in Mechanical Engineering (Production Engineering) and as a specialist welding engineer from the University of Applied Sciences Würzburg-Schweinfurt in 2006.
Prof. Dr. Robert Grebner studied Computer Science at the Friedrich Alexander University of Erlangen-Nuremberg. During his studies, he founded a software company with one of his fellow students. There, he developed and sold system-oriented and business-oriented software. Then he did his doctoral degree at the same university in the field of computer-aided group work and developed software agents on the basis of approaches from cognitive science. During this period, he also led and worked on projects for the Federal Ministry for Education and Research (BMBF) on the subjects of teleteaching and distance learning. After his doctoral degree, he moved to Freudenberg Spezialdichtungsprodukte GmbH & Co. KG, where he developed and was responsible for production planning and manufacturing execution systems as well as ERP system components, as Head of Information Management. In 2002, he was appointed Professor of Computer Science at the Friedrich Alexander University of Erlangen-Nuremberg. He followed his doctoral degree in pattern recognition with industrial activities in the area of robot control software. In 1991, he was appointed to what is now the Nuremberg Institute of Technology Georg Simon Ohm to teach in the areas of robot technology, production automation and applied computer science. Since 2012, he has also been involved in the Nuremberg Campus of Technology (a joint research campus of the University of Erlangen-Nuremberg and the Nuremberg Institute of Technology). His fields of research are industrial robots and human-robot collaboration.

Prof. Dr. Andreas Hagerer is Professor of Computer Engineering and Engineering Mathematics at Ingolstadt University of Technology and Programme Director of a master’s degree programme in International Automotive Engineering with a focus on vehicle mechatronics. In the course of a restructuring of the faculties and a realignment/redesign of existing and new degree programmes, he has undertaken the task of coordinating associated discussions. The degree programmes which are to be redesigned include the Mechatronics degree programme, which is to teach robotics themes more intensely in the future.

Prof. Dr. Peter Hess studied Computer Science at the Friedrich Alexander University of Erlangen-Nuremberg. He followed his doctoral degree in pattern recognition with industrial activities in the area of robot control software. In 1991, he was appointed to what is now the Nuremberg Institute of Technology Georg Simon Ohm to teach in the areas of robot technology, production automation and applied computer science. Since 2012, he has also been involved in the Nuremberg Campus of Technology (a joint research campus of the University of Erlangen-Nuremberg and the Nuremberg Institute of Technology). His fields of research are industrial robots and human-robot collaboration.

Prof. Dr.-Ing. Dirk Jacob After studying Mechanical Engineering at the Technical University of Munich (TUM), Prof. Dr.-Ing. Jacob also did his doctoral degree in the area of automated micro-assembly at the TUM. After moving to industry, he worked at KUKA Roboter GmbH for seven years in various positions. He was responsible for the development of applications for robot systems, amongst other things. For just under eight years, Prof. Dirk Jacob has worked in the field of manufacturing automation and robotics at Kempten University of Applied Sciences. He was responsible for setting up the bachelor’s degree programmes in Mechatronics and Systems Engineering and the master’s degree programme in Automation Technology and Robotics. He has been Vice President of Teaching and Quality Management at Kempten University of Applied Sciences for 3 years. In addition, he advises companies on solutions in the area of the automation of production plants, especially using robot technology.
PARTICIPANTS

Prof. Dr. Tobias Kaupp has been research professor of digital production and robotics at the University of Applied Sciences Würzburg-Schweinfurt since November 2018. Before that, he worked for ten years as the Managing Director and co-founder of a mobile robotics company in Australia. Prof. Kaupp completed his doctoral degree at the University of Sydney in the field of “collaborative human-robot interaction” in 2008. Prof. Dr. Kaupp received a diploma in Physical Engineering from a university of applied sciences in 2001 and an M.Sc. in Mechatronics in 2003. Both qualifications were awarded by the Ravensburg-Weingarten University of Applied Sciences.

Prof. Dr. Ing. Gerald Kupris is Dean of the Faculty of Electrical Engineering, Media Technology and Computer Science at the Deggendorf Institute of Technology. After studying Electronics, he started out as a development engineer in 1989 and completed his doctoral degree in 1994 at Ilmenau University of Technology. From 1997 to 2009, he worked at Motorola and Freescale Semiconductor as a senior field application engineer. There, he supervised a number of projects in industry and the automotive sector. In 2009, he became a professor at Deggendorf Institute of Technology, where he represents the area of embedded systems. In 2018, he set up the new autonomous systems / driver assistance systems laboratory, in which autonomously driving lab cars and driving robots are used.

Prof. Dr. Qitao Lue is the Executive Vice President and Chief Technology Officer of Han’s Laser Technology Industry Group Co., Ltd. After completing his studies at the Chinese Huazhong University of Science & Technology in 1984, Prof. Dr. Lue received a grant from the Konrad Adenauer Foundation and started by studying at the Department of Physics at the University of Kaiserslautern. Then he worked as a research assistant in Prof. Horst Weber’s renowned working group at TU Berlin and successfully completed his doctoral degree in 1992. He began his professional career at the Solid State Laser Institute in Berlin and demonstrated his abilities as a senior employee at numerous leading laser companies (Rofin-Sinar Laser GmbH, Bavarian Photonics GmbH and Coherent Deutschland Inc.) for more than 15 years. In June 2008, he returned to China and joined the Han’s Laser Technology Industry Group. For the past 10 years, he has been a member of the board and is responsible for the development of numerous laser beam sources and laser systems as the CTO. Han’s Laser currently employs more than 12,000 people throughout the world, achieves an annual turnover of approx. 2 billion USD and is one of the global industry leaders. Since 2016, he has been the Dean and a distinguished professor at the Sino-German College of Intelligent Manufacturing of Shenzhen Technology University.

Martin Kraus is Head of the IT Service Centre at the University of Applied Sciences Würzburg-Schweinfurt. He supports the university management in the University Development Unit with strategic and innovative areas of activity. After gaining his diploma in Business Information Systems and a Master of Science in Information Systems, he completed further training courses in futurology and creativity research. This was done with a view to developing processes for shaping the future in theory and in practice in order to secure the future viability of employees and organisations. He gained more than 10 years of practical experience in business with an international supplier of the automotive and mechanical engineering industry.

Stefan Kunkel has been with Warema Kunststofftechnik und Maschinenbau GmbH in the field of special machine construction for more than 20 years. His area of activity is, in particular, construction and project management. In 2012, Mr Kunkel became head of development and construction. Mr Kunkel is head of the mechanical engineering since 2017. The use of robotics is common practice in plastic injection moulding production. Warema uses 6-axis robots and multi-axis system also in special machine construction.

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Prof. Dr. Jean Meyer has taught at the University of Applied Sciences Würzburg-Schweinfurt (FHWS) since 2017. His fields of teaching include robotics (with a focus on industrial robotics) and foundation modules of mechanical engineering. Prof. Dr. Jean Meyer studied aerospace engineering and completed his doctoral degree in the field of the non-destructive testing of carbon fibre-reinforced plastics. In his professional career, he worked as a systems engineer for the fighter plane Eurofighter and as a research assistant at the Bundeswehr Research Institute for Materials, Fuels and Lubricants (WITec).

Prof. Dr. Norbert Nitzsche
2000-2005: Doctoral degree at the Chair of Automatic Control Engineering at the Technical University of Munich, supervised by Prof. Günther Schmidt in the field of robotics and telepresence. 2005-2016: BMW, chassis control vertical and lateral, highly automated driving. since 2016: Professor of Control Engineering at FK03 at Munich University of Applied Sciences.

Prof. Dr. Martin Orehek
studied Electrical Engineering and completed his doctoral degree in 2003 in the area of software development for embedded real-time systems in the course of his research work at the Technical University of Munich. After that, he worked in various research and development projects in the industry. The key themes were the model-based development of embedded systems and the networking of these systems. In September 2011, he was appointed a professor at the Department of Computer Science and Mathematics at Munich University of Applied Sciences, where he has been involved in research and teaching in the area of embedded software engineering ever since.

Prof. Dr. Ing. Martin Ochs
studied Electrical Engineering at the Technical University of Munich. After graduating as an engineer in 1991, he worked as a research associate to the Chair of Precision Engineering at the Technical University of Munich. In this role, he took on a series of research tasks, including in the Collaborative Research Centre 336 at the Technical University of Munich and in the Brite/Euram 2 project BRE20628. He did his doctoral degree in 1996 at the Department of Mechanical Engineering at the Technical University Munich in the field of roughness metrology. In 1996, he moved to Karl Süss KG in Garching as a development engineer for hardware and software. There, he achieved a 150 % increase in the machine throughput for the main product of Karl Süss KG through an optimisation of the runtime software. In 1997, he became the team leader for hardware and software at the Garching site. In this role, he led the 10 developers in the team and streamlined the development processes for the special machines. These tasks were associated with a number of visits and, in some cases, with longer stays at the subsidiary in the USA. Since 1 October 2000, Martin Ochs has taught control engineering as a professor at Hof University of Applied Sciences. After initial smaller research projects, he took on the leadership of the Engineering Department as the Dean from 2003.
PARTICIPANTS

Prof. Dr. Ruan Shuangchen received his bachelor’s degree in 1986 and his master’s degree in 1989 at Northwest University. From 1993 to 1994, he studied at Imperial College London. In 1994, he was appointed as a professor. In 2004, he completed his doctoral degree at Tianjin University. Since 2005, he has been Vice President of Shenzhen University. In 2016, he was appointed President of Shenzhen Technology University. He received third prize in the Award for Progress in Science and Technology at a state level. In the Award for Progress in Science and Technology on a province and ministry level, he has won first prize once, second

Prof. Dr. Jörg Roth has taught in the area of computer communication at Nuremberg Institute of Technology since 2006 and offers elective modules in the area of geographical reference and self-localisation. His research interests include the areas of mobile robotics and geographic data. He deals with environmental modelling, geometric and graph-based algorithms and processes for path planning. He successfully uses two mobile robot platforms in his teaching within the framework of special lectures, study projects and final theses. Professor Dr. Jörg Roth is the founder of the annual expert discussion group “Location-based Applications and Services”, and chairman of the international conference “Theory and Practice in Modern Computing”.

Torsten Reiher completed his training as a machine and systems technician at FAG Kugelfischer. After his training, he worked in spindle bearing production as a cell operator. From 2010, he moved to tool management after completing his training as a mechanical engineering technician at the DAA in Würzburg. He was then responsible for supplying and redesigning tools for production. Since August 2018, he has been Head of Tool Management.

Dr. Sven Rebhan did his doctoral degree in 2010 at Ilmenau University of Technology in the area of cognitive robotics. Since 2005, he is working at Honda Research Institute in the fields of computer vision, scene representation, driver assistance systems, autonomous driving, energy management. On the basis of this expertise, he has made a decisive contribution towards the realisation of a predictive driver assistance system which entered series production in 2015.

Prof. Dr. Günther Pröbstle studied Physics at the Friedrich Alexander University of Erlangen-Nuremberg. After three years of research at the Paul Scherrer Institute, a so-called annex institute of ETH Zürich, he did his doctoral degree at the Karlsruhe Institute of Technology, KIT. For 20 years, he held various senior roles in the plant construction industry, including the fields of fluid mechanics and thermal engineering, system simulation, as well as control and automation technology. In his last position, he was overall manager of a business segment for the conversion, modernization and servicing of large-scale plants. Since 2001, he teaches the subject areas maintenance, technical diagnostics, and plant reliability at Ansbach University of Applied Sciences. Long-term cooperation in the Center of Excellence for TPM, CETPM, today a so-called annex institute of Ansbach University of Applied Sciences. Since 2012, he is vice president of Ansbach University of Applied Sciences and thus responsible for the areas research and transfer.

Prof. Dr. Ing. Plenk has been Scientific Head of the Institute of Information Systems at Hof University of Applied Sciences.

Prof. Dr. Ruan Shuangchen received his bachelor’s degree in 1986 and his master’s degree in 1989 at Northwest University. From 1993 to 1994, he studied at Imperial College London. In 1994, he was appointed as a professor. In 2004, he completed his doctoral degree at Tianjin University. Since 2005, he has been Vice President of Shenzhen University. In 2016, he was appointed President of Shenzhen Technology University. He received third prize in the Award for Progress in Science and Technology at a state level. In the Award for Progress in Science and Technology on a province and ministry level, he has won first prize once, second
Dipl.-Ing. (FH) Hans-Jürgen Schneider has been responsible for the management of the Schweinfurt site of ZF Friedrichshafen AG since 2016. After studying Electrical Engineering, he began his professional career in medical technology in 1983, before moving to what was then Fichtel & Sachs in 1986, where he became Head of Software Development in 1991. After management of the development of mechatronics came the responsibility for the development of the double clutch in 2000, which was followed by management of the car driveline technology trial in 2005. As of 2008, management of the development of electrical drives was transferred to him, which he directed as a business unit manager from 2014. He did this as a dual role in parallel to the site management until January 2017. During this time, H. J. Schneider gave a number of international talks on the subject of e-mobility.

Prof. Dr.-Ing. Gerhard Schillhuber studied Industrial Mathematics at the Technical University of Munich. After graduating, he worked at the German Aerospace Centre (DLR) in collaboration with the robot manufacturer KUKA. Then he did his doctoral degree at the Chair for Applied Mechanics at the Technical University of Munich in the field of telerobotics. After his doctoral degree, he took over the management of the field of research biomechanics at the Polyclinic for Orthodontics at LMU Munich. He accepted the appointment as Professor of Systems Analysis in Mechatronics at Kempten University of Applied Sciences. He now works as a professor at the Department of Electrical Engineering and Information Technology at Munich University of Applied Sciences and undertakes research and teaching in the fields of computer engineering, embedded systems and robotics.

Prof. Dr. Gudrun Schiedermeier has been responsible for the management of the Schweinfurt site of ZF Friedrichshafen AG since 2016. After studying Electrical Engineering, he began his professional career in medical technology in 1983, before moving to what was then Fichtel & Sachs in 1986, where he became Head of Software Development in 1991. After management of the development of mechatronics came the responsibility for the development of the double clutch in 2000, which was followed by management of the car driveline technology trial in 2005. As of 2008, management of the development of electrical drives was transferred to him, which he directed as a business unit manager from 2014. He did this as a dual role in parallel to the site management until January 2017. During this time, H. J. Schneider gave a number of international talks on the subject of e-mobility.

Prof. Dr. Ing. Gerhard Schillhuber studied Industrial Mathematics at the Technical University of Munich. After graduating, he worked at the German Aerospace Centre (DLR) in collaboration with the robot manufacturer KUKA. Then he did his doctoral degree at the Chair for Applied Mechanics at the Technical University of Munich in the field of telerobotics. After his doctoral degree, he took over the management of the field of research biomechanics at the Polyclinic for Orthodontics at LMU Munich. He accepted the appointment as Professor of Systems Analysis in Mechatronics at Kempten University of Applied Sciences. He now works as a professor at the Department of Electrical Engineering and Information Technology at Munich University of Applied Sciences and undertakes research and teaching in the fields of computer engineering, embedded systems and robotics.

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Prof. Dr. Frank-Michael Schleif has taught at the University of Applied Sciences Würzburg-Schweinfurt since 2016 in the area of data management and business intelligence, as well as on various courses connected to data science. His research interests include topics in machine learning and computational intelligence for non-standard data. In particular, he deals with learning methods for non-metric similarities.

Prof. Dr. Nobert Strobel
After studying Electrical and Computer Engineering at UC Santa Barbara (UCSB), Prof. Dr. Norbert Strobel also completed his doctoral degree at this higher education institution in the field of image transfer and archiving for digital satellite image databases ("Multiresolution based storage, browsing and retrieval for digital image libraries"). After he moved into industry, he developed a procedure for 3D imaging with angiography systems (syngo DynaCT) at Siemens Healthineers. Following the development of the algorithm, Prof. Dr. Strobel moved to Stanford University for four years to clinically evaluate this reconstruction procedure in collaboration with the doctors and scientists there. After a successful 510k approval of the method, he returned to the German Innovation Department of Siemens Healthineers, where he worked on 3D-based navigation procedures for X-ray-supported, minimally invasive therapy (augmented fluoroscopy). For two years now, Prof. Dr. Strobel has been a professor at the University of Applied Sciences Würzburg-Schweinfurt. Here, he particularly occupies himself with medical technology, computer science and robotics.

Prof. Dr. Gabriele Saueressig studied Business Education, specialising in business information systems, at the Friedrich Alexander University of Erlangen-Nuremberg. After her studies, she worked as an IT consultant at the international IT consultancy company CSC Ploenzke and, after a year, moved back to the same university to do her doctoral degree. She wrote her thesis on the subject of "Internet-based self-service systems for customer-oriented service processes at public bodies.” Projects in the area of e-business and her occupation with business processes and the improvement of these supplemented her research activities. After completing her doctoral degree in 2000, Prof. Dr. Saueressig assumed responsibility for e-business for the region of southern Germany at CSC Deutschland AG and transferred to account management after 2 years. There, she was responsible for various IT projects with a focus on the automation of business processes, as well as the strategic development of IT and e-business for industrial companies.

In 2005, Prof. Dr. Saueressig took on a half professorship at Ingolstadt University of Technology in the field of software engineering. In 2007, she moved to Stanford University for four years to clinically evaluate this reconstruction procedure in collaboration with the doctors and scientists there. After a successful 510k approval of the method, she returned to the German Innovation Department of Siemens Healthineers, where she worked on 3D-based navigation procedures for X-ray-supported, minimally invasive therapy (augmented fluoroscopy). For two years now, Prof. Dr. Strobel has been a professor at the University of Applied Sciences Würzburg-Schweinfurt. Here, he particularly occupies himself with medical technology, computer science and robotics.

In 2008 to 2012, Prof. Dr. Saueressig was Dean of the Faculty of Computer Science and Business Information Systems at FHWS and she has been responsible for the areas of quality and university development since 2012 as a vice president.
**PARTICIPANTS**

Prof. Yan Ping  
Is a professor at the College of Creative Design at Shenzhen Technology University, a graphic designer, and a visiting scholar at the University of Kansas. Formerly, she was Head of the Department for Academic Affairs at Academy of Fine Arts, Director of the Advertising Studies Department at the College of Mass Communication at Shenzhen University, and supervisor of the master’s students.  
For a long time, Prof. Yan has been active in teaching and practice-oriented research in the areas of logo design, mascot design, graphic design and advertising design. She has won a gold medal in the area of mascot design in the People’s Republic of China City Games. Her works have been awarded with numerous gold, silver and bronze prizes on a provincial and national level. She has published dozens of papers. She was involved in the preparation of the national quality course “Digital Colour” and in video presentations. She published a number of textbooks, for example “Mascot Design”, “An Analysis of Modern Animation Art Design”, “Experimental Tutorial on Logo and Mascot Design”, “Graphic Design and Performance for Advertising”. The water colour work “Bloom” was acquired by the PTP headquarters in Kansas, USA. In 2016, she was invited to design a campus mascot for Shenzhen University – “Li Li”, which was extremely well received.

Prof. Dr. Dagmar Unz  
Diploma in Psychology at Saarland University, doctoral degree at the University of Tübingen, post-doctoral qualification at the Philosophical Faculty III: Empirical Humanities, Saarland University; field of teaching communication studies and media psychology; addresses the use of digital and social media in the areas of activity of social work, empirical methods for the analysis of the usage patterns of digital media services, and emotional and cognitive processing operations, the emotional and cognitive effects of the use of digital and social media. She also tackles socio-pedagogical audience research and questions relating to the implementation of measures.

Prof. Dr. Ulrich Walwei  
Is Vice Director of the Institute for Employment Research (IAB) and has been Honorary Professor of Labour Market Research at the Institute of Economics and Econometrics at the University of Regensburg since 6 December 2017. He studied Economics at Paderborn University and did his doctoral degree in issues relating to law and economics (Dr. rer. pol.). There, he was a research assistant to the Chair of Public Finance, Prof. Dr. Friedrich Buttler. He has worked at the IAB since 1988. He held various positions there. He was, for example, head of the IAB research division “Growth, Demography and the Labour Market”. Since 2003, he has been on the management board of the IAB as a vice director. He was a lecturer at the University of Regensburg for many years.

Prof. Dr. Zeng Siyu  
Was at South China Normal University from 2004 to 2008. In 2008, she started work as a lecturer at Shenzhen University. Since 2016, she has been Director of the International Cooperation and Student Affairs Office and an associate professor at Shenzhen Technology University.
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