

Prof. Dr.-Ing. Tanja Schultz

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Business Address

Cognitive Systems Lab
Faculty Mathematics & Computer Science
University Bremen
Enrique-Schmidt-Str. 5
28359 Bremen, Germany
Phone: +49 421 218 64270
Fax: +49 421 218 98 64270
Email: tanja.schultz@uni-bremen.de
Web: <http://csl.uni-bremen.de>

Home Address

Schwachhauser Heerstr. 251
28211 Bremen
Mobile: +49 171 5479597

Personal Data

Birth Date: February 6, 1964
Birthplace: Oldenburg i.O., Germany
Citizenship: German

Education

1970 – 1974

Elementary School – Waldparkschule Heidelberg

1974 – 1983

High School – Gymnasium Wiesloch, "Abitur"

1983 – 1989

1st degree: State examination for teaching at grammar schools (Staats-examen für das Lehramt an Gymnasien) in Mathematics (July 1989), and Sports, Physical Education and Educational Science (November 1989), Ruprecht-Karl Universität Heidelberg, Heidelberg, Germany

Master thesis: *"Die Bedeutung der Normierung für die praxisnahe Gestaltung sportmotorischer Tests"*; Advisor: Prof. Dr. Klaus Bös

1990 – 1995

2nd degree: Diploma (Dipl.-Ing.) in Computer Science, Karlsruhe University (TH), Karlsruhe, Germany

Diploma thesis: *„Identifizierung von Sprachen -Exemplarisch aufgezeigt am Beispiel der Sprachen Deutsch, Englisch und Spanisch“*; Advisors: Prof. Dr. Alex Waibel and Dr. Ivica Rogina

Scientific Career

- **1995 – 2000** Graduate Research Assistant / PhD Student at the University of Karlsruhe, Germany, Faculty of Informatik, Institute for Logik, Complexity and Deduction Systems
- **July 2000** Doctoral Degree in Computer Science (Dr.-Ing.) at the University of Karlsruhe Dissertation on Multilingual Speech Recognition; Advisor: Alex Waibel (University of Karlsruhe), Co-Advisor: Dirk van Compernelle (Katholieke Universiteit Leuven, Belgium)
- **September 2000 – December 2000** Postdoctoral Fellowship at the Interactive Systems Laboratories, Carnegie Mellon University (CMU), Pittsburgh, Pennsylvania USA
- **January 2001 – June 2002** Promoted to Research Associate at the Language Technologies Institute, Interactive Systems Laboratories, CMU, Pittsburgh, Pennsylvania USA
- **July 2002 – May 2007** Promoted to Research Assistant/Associate Professor, Faculty at Language Technologies Institute, CMU, Pittsburgh, PA USA
- **October 2005 – 2010** Appointed Associate Director, InterACT: Center for Advanced Communication Technologies, Carnegie Mellon University and Karlsruhe University
- **March 2007 – March 2015** Full professor (W3) at Karlsruhe Institute of Technology, Department of Informatics, Chair for Cognitive Systems
- **2007 – 2021** Appointed Adjunct Professor, Faculty at Language Technologies Institute, Carnegie Mellon University, Pittsburgh, Pennsylvania USA
- **July 2007 – present** Director of the Cognitive Systems Laboratory (CSL)
- **April 2015 – present** Full Professor (W3), Chair for Cognitive Systems, Faculty of Mathematic/Informatics at University Bremen, Germany

Current Positions and Functions

- since 2022 Spokesperson of the DFG Research Unit FOR 5347 LifespanAI
- since 2022 Board of Trustees of Deutscher Studienpreis, Körber-Stiftung
- since 2022 Evaluation commission of the Wissenschaftsrat
- since 2021 Board of Directors DFG GRK 2739 KD²School
- since 2021 Co-spokesperson lead project “Artificial Intelligence” University Bremen Alliance of Research (UBRA)
- since 2021 Board of Directors “AICenter4healthcare”, UBRA
- since 2021 Board of Trustees of the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (IOSB)
- since 2020 Board of Trustees of the Fraunhofer Institut for Digital Media Technology (IDMT)
- since 2020 Chair of the Advisory Board of the UKRI Centre for Doctoral Training in Speech and Language Technologies, University of Sheffield, UK
- since 2019 Board of Directors, Leibniz-Science Campus on Digital Public Health
- since 2019 Spokesperson of high-profile area Minds, Media, Machines at Uni Bremen
- since 2017 Board of Directors, DFG CRC 1320 EASE
- since 2016 International Advisory Board of ISCA, International Speech Communication Association
- since 2007 Managing Director of the Cognitive Systems lab
- since 2003 Founder of XLingual LLC and Co-owner of XLingual GmbH & Co KG

Awards and Honors

- 2022 Elected IEEE Signal Processing Society Distinguished Lecturer for term 2022-2023
- 2021 Fellow of the Asia-Pacific Artificial Intelligence Association
- 2020 Google Faculty Research Award for the project on "EMG-to-Speech: End-to-End Silent Speech Conversion based on Electromyography"
- 2020 Elected Fellow of IEEE (for contributions to Multilingual Speech Recognition and Biosignal Processing)
- 2017 Elected Fellow of the European Academy of Sciences and Arts
- 2016 Elected Fellow of ISCA (for contributions to Multilingual Speech Recognition and Biosignal Processing for Human-Machine Interaction)
- 2013 Awarded with the Otto Haxel Price together with C. Amma and M. Georgi
- 2013 Google Faculty Research Award for the Topic "Aerial: Seamless interaction for wearable computers", together with Christoph Amma.
- 2012 Awarded with the "Technical Communication Research Prize" from the Alcatel-Lucent Stiftung for her scientific oeuvre in the field of „Humans and Machines in Communication Systems“, particularly in the area of "Silent Speech Communication".
- 2005 Awarded with Carnegie Mellon Language Technologies Institute Junior Faculty Chair
- 2002 Awarded with the "Allen Newell Medal for Research Excellence" in Speech-to-Speech Translation, School of Computer Science at Carnegie Mellon University
- 2001 Awarded with the "Forschungszentrum Informatik" prize for an exceptional Dissertation

Awards at Scientific Conferences

- 2021 Best Student Paper Finalist at the BIOSTEC Conference on Biosignals for the paper entitled "Feature Space Reduction for Human Activity Recognition Based on Multi-Channel Biosignals" by Yale Hartmann, Hui Liu, and Tanja Schultz
- 2019 Best Student Paper Award BIODEVICES on "A Wearable Real-time Human Activity Recognition System using Biosensors Integrated into a Knee Bandage" with H. Liu
- 2018 BCI Award 3rd place with the contribution "Brain-to-Speech: Direct Synthesis of Speech from Intracranial Brain Activity Associated with Speech Production" with C. Herff, L. Diener, E. Mugler, M. Slutzky, D. Krusienski
- 2016 The publication "Brain-to-Text: Decoding spoken sentences from phone representations" nominated among the "100 Articles in the Spotlight" in Frontiers Blob (top 4 downloads of 12.500 publications in year 2015, 99% view rank).
- 2015 ICSA / EURASIP Best Journal paper award of the Speech Communication Journal for the publication "Silent Speech Interfaces"
- 2015 Best Student Paper Award BIOSIGNALS with M. Georgi and C. Amma
- 2015 Finalist for the 2015 Brain-Computer-Interfaces Award with C. Herff and D. Heger
- 2014 Finalist for the 2014 CeBIT Innovation Award with C. Amma und F. Winnen
- 2013 Geographic Finalist Europe IEEE Engineering in Medicine and Biology Society with D. Heger, F. Putze und C. Herff
- 2013 Best Student Paper Award BIOSIGNALS 2013 together with Michael Wand, Matthias Janke and Christopher Schulte for the publication "Array-based Electromyographic Silent Speech Interface".

- 2012 Best Paper Award, International Symposium on Wearable Computers (ISWC), together with Christoph Amma and Markus Georgi for the publication "Airwriting: Hands-free mobile text input by handwriting with inertial sensors".
- 2011 PLUX Wireless Biosignals Award for the project "Airwriting Recognition using Wearable Motion Sensors" by Christoph Amma, Dirk Gehrig and Tanja Schultz awarded at International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC 2011).
- 2010 Best Student Paper Finalist at the International Conference on Social Robotics in Singapore for the paper entitled "An Adaptive Information System for an Empathic Robot using EEG Data" by Dominic Heger, Felix Putze and Tanja Schultz.
- 2009 BIOSTEC - BIOSIGNALS 2009 best selected papers Michael Wand, Tanja Schultz, Towards Speaker-Adaptive Speech Recognition based on Surface Electromyography.
- 2008 BIOSTEC - BIOSIGNALS 2008 best selected papers Tanja Schultz und Szu-Chen Jou „Automatic Speech Recognition based on Electromyographic Biosignals“.
- 2006 ISCA Best Demo Award for the most far-sighted demonstration at Interspeech 2006 "An Electromyographic Silent Speech Translation Prototype".
- 2002 ICSA Best journal paper award for the publication in the Speech Communication Journal between 2000 and 2001 entitled: Language Independent and Language Adaptive Acoustic Modeling for Speech Recognition

Inventions and Patents

- 2022 Invention: Control and Interaction and Sensor-Based Foot Activity Recognition, with H. Liu, Patent in process, University of Bremen
- 2014 Patent „Method and system for handwriting and gesture recognition“ with C. Amma filed Februar 2014, granted April 2018 as EP2911089B1; filed in WO2015128151A1 and JP2017516176A, pending.
- 2013 Invention: "Methods and system for handwriting and gesture recognition", July 2013.
- 2013 Patent "Methods and apparatus for the transformation of myoelectric signals into audible speech", filed Dec 2013 PCT/EP2014/003372, WO2015090562A2 pending
- 2012 Invention: Methods and apparatus for the transformation of myoelectric signals into audible speech, filed March 2012
- 2012 Development and Licensing of Software "BioKIT" Decoder for the processing, recognition, and interpretation of Biosignals, KIT
- 2011 Methods and Apparatuses for Myoelectric-based Speech Processing, T. Schultz and A. Waibel, US Patent 8,082,149, filed Oct 2006, granted December 2011
- 2003 Founder and president of the company XLingual, LLC that owns the copyrights for GlobalPhone and licenses the database, distributions with ELRA and Appen Ltd.
- 2001 Invention: Design, collection, and distribution of the multilingual speech and text database GlobalPhone for the development of multilingual speech recognition and translation systems for large vocabularies in 22 languages.

Main Research Focus and Research Projects

Biosignal and Processing: advance machine learning and AI methods and algorithms for low-latency processing, recognition, and interpretation of biosignals resulting from speech, motion, muscle and brain activities; Record and fuse multimodal signals from a wide range of sensors, such as microphones, cameras, eyetracker, Electromyography (EMG), Electroencephalography (EEG and intracranial ECoG), and functional Nearinfrared spectroscopy (NIRS).

Multilingual Speech Processing: rapid adaptation of speech recognition and synthesis for low-resource languages, code-switching.

Biosignal-adaptive cognitive systems: develop real-time intelligent systems that dynamically adapt to users needs interpreted from biosignals, for the application in

- *social interaction and communication:* silent speech interfaces, hate speech, neuro speech prostheses, gesture and airwriting
- *social robotics:* model and interpret human behavior to enable robots mastering everyday activities
- *health prediction and inference:* early prediction of cognitive impairments from speech and language as biomarkers, track health outcome over lifespan, support early disease detection and prevention
- *health care and assistance:* intelligent bandages, activation systems for people with dementia, speech, gait & frailty
- *economy:* focus of attention, decision making

Current Grants (as PI, Co-PI, Budget CSL)

Tanja Schultz has raised more than 20 Million Euros in funding since 2018, about 7.5 Million Euros of which go to her working group, the Cognitive Systems Lab.

2023-2026	DFG FOR 5347 Lifespan AI: From Longitudinal Data to Lifespan Inference in Health, which will blend epidemiological studies with biosignal data over the lifespan to advance Machine Learning (ML) and Deep Learning (DL) methods to uncover the causes of disease outcomes and optimize prevention strategies. Cooperation between Uni Bremen and BIPS with 10 PIs, Role Schultz Spokesperson CSL 1040 T€; overall Budget over 4100T€
2022-2025	DFG D-A-CH MyVoice: Ein myoelektrisches Sprachverarbeitungssystem zur Interaktion und Kommunikation, cooperation with Dr. Michael Wand, Istituto Dalle Molle di studi sull'Intelligenza Artificiale (IDSIA-Lab Jürgen Schmidhuber) USI-SUPSI, Polo universitario Lugano CH, and Profs. Inmaculada Hernáez Rioja and José A. González, Universities of Bilbao and Malaga, Spain; Budget 563T€
2022-2025	DFG Beethoven HateSpeech: Hate speech – From automatic classification to understanding emotional dynamics, DFG Beethoven CLASSIC 4 – Polish-German Funding Initiative, joint proposal with Dr. Aleksandra Świdorska, Psychology Department, University of Warsaw; Budget 257T€
2022-2025	DFG SPP 2134 The Active Self – Project Cognitive control of social resonance; Partner: Uniklinikum Dresden, ZIB Berlin; Role of Schultz Team: measure social resonance in comprehensive and automatized fashion; Budget approx. 286T€
2022-2025	BMG ETAP: Evaluation von teilautomatisierten Pflegeprozessen in der Langzeitpflege am Beispiel von KI-basiertem Bewegungsmonitoring,

- Collaborative Project funded by the German Ministry of Health with partners Westfälische Hochschule (Coordinator), Universität Bremen IPP and CSL, FutureApp Solutions, AWO Karlsruhe, and Stift Tilbeck; Budget **415T€**
- 2022-2025 BMBF IntEL4CoRo - Integrierte Lernumgebung für kognitive Robotik, German Ministry of Education and Research, Cooperation with Bremen partners, Institute for Artificial Intelligence (coordinator) and Center for Multimedia in der Teaching, Network Center, Virtual Akademie Nachhaltigkeit, Center for Media, Commincaiton and Informationresearch; Budget **128T€**
- 2021-2026 DFG GRK 2739 KD²School – Adaptive Systems for Economic Decisions (Speaker Weinhardt, KIT, Co-Speaker Schultz); Partner: KIT, Uni Bremen, Uni Gießen; Role of Schultz Team: Advising Doctoral Students on Modeling User States from Biosignals, Adaptive Technical Systems for Decision Making; Linking Laboratories Bremen-Karlsruhe; Budget approx. **600T€**
- 2021-2024 NAKO+ILSE, UBRA AI Center 4 Healthcare Bremen State Funding (Speaker Schultz), Partner: MEVIS Fraunhofer; Role of Schultz Team: Acquisition of spoken interviews plus MRI Images of NAKO volunteers, fusion of multimodal data dementia prediction from speech and brain images; Budget **376T€**
- 2021-2025 AI-Center for Health Care, Bremen State Funding for AI (Co-Speaker Schultz); Total Budget approx. **6050T€**
- 2021-2025 DFG CRC 1320 Everyday Activity Science and Engineering, Phase2 (Schultz leader of Research Area H Descriptive models of human everyday activities); Role of Schultz' Team: H3 Discriminative and Generative Human Activity Models for Cognitive Architectures; Budget approx. **600T€**
- 2021-2023 BMBF-NSF ADSPEED Adaptive low-latency Speech Decoding and Synthesis using intracranial signals; Multilateral Cooperation in Computational Neuroscience funded by BMBF and NSF; Partner: Prof. Dean Krusienski, ASPEN Neuroscience Lab at Virginia Commonwealth University, USA; Budget **334T€**
- 2020-2024 University Bremen High-profile area Minds, Media, Machines (Spokesperson), Bremen State Funding; Coordination and initiation of research initiatives and projects, research network; Budget: **2500T€**
- 2020-2021 Google Faculty Research Award on the project "EMG-to-Speech: End-to-End Silent Speech Conversion based on Electromyography"; Schultz Awardee, sponsored by Google Ireland Ltd.; approx. **75T€**
- 2019-2022 BMWi SmartHelm – An attention-aware assistant system integrated into a bicycle helmet; Federal Ministry of Transport and Digital Infrastructure BMWi; Partner: Universität Oldenburg, VLBA, CITIPOST, Ubimax, UVEX Sports Group Rytte; Role: Multimodal detection of attention from EEG and eyetracking and multilingual speech recognition for cargo bikers; Budget approx. **504T€**
- 2019-2021 DFG ALMED Akustische und Linguistische Merkmale zur Früherkennung kognitiver Defizite; Partner: Prof. Johannes Schröder, Universität Heidelberg; Role of Schultz' Team: Development of automatic speech recognition, feature extraction, and automatic dementia screening systems based on spoken interviews of the ILSE corpus; Budget approx. **341T€**
- 2017-2022 International Gradschool „Empowering Digital Media“ (Speaker Malaka); Sponsor: Klaus-Tschira-Foundation; Role of Schultz' team: stipend for one PhD student on the topic "Interpret digital traces via machine learning"

- 2017-2021 DFG CRC 1320 Everyday Activity Science and Engineering, Phase1 (Schultz leader of Research Area H Descriptive models of human everyday activities); Role of Schultz' Team: H3, H4; Budget approx. **600T€**
- Since 2012 Karlsruhe Decision & Design Lab, DFG-funded laboratory for biosignal processing, DFG 91b (Weinhardt/Schultz); 40-unit lab with modern mobile devices to capture biosignals (brain – EEG, fNIRS, muscles – EMG, physio – EDA, EKG, as well as Eyetracking, Video and Audio for interaction monitoring, etc.) and allows to investigate human-machine interaction
- Since 2004 GlobalPhone, RLAT Rapid Language Adaptation Toolkit, Web-based tools to efficiently initialize and rapidly port speech processing systems to new languages and domains (different funding bodies, industry, NSF), in context with the projects of Spice, GlobalPhone and Festival.

Selected Past Grants (as PI, Co-PI, key personal)

as PI/Co-PI at Bremen University, Germany:

RESPONSE (2017-2019, BMBF-NSF), AsaROB (2017-2019, BMBF), I-CARE (2016-2019, BMBF), Arthrokinemat (2016-2019, BMWi)

as PI/Co-PI at Karlsruhe Institute of Technology, Germany:

MAPS (2013-2016, DFG), GonyTech (2013-2016, BMWi), AKTIV (2013-2016, Ba-Wü Stiftung) Wearable Computing (2013, Google), HeiKA1,2 (2012-2013, KIT-HD Exc funds), QUAERO (2008-2013, OSEO France), DFG CRC 588 Humanoid Robots, WP lead (2008-2012, DFG), Code-Switch (2010-2012, Temasec Labs, Singapore), WHISPER, SILENT (industrial projects)

as PI/Co-PI at Carnegie Mellon University, Pittsburgh, PA:

GALE (2005-2010, DARPA), ASR (2009-2011, RADC), FarSID (2007-2009, ITIC, DARPA), Multilingual Speech Recognition (2006-2008, CSIT Singapore), SPICE (2004-2008, NSF), TransTac-I+II (2004-2006, DARPA), NineOneOne (NSF), Laser ACTD I + II (2003-2006, DARPA), CHIL (2003-2006, EU) Koordination CMU, Str-Dust (2003-2006, NSF), Dolphins (2002-2003, Wild Dolphins Foundation), CHENGO (2002-2004, Department of Education);

as consultant/commission member:

EU ICT COST Action IC1206 „De-identification for privacy protection in multimedia content”, (2013-2018, Commission Member Germany, CogniFit (2009-2011, Germany KIT- Charité Excellence Funding); Thinking Head (2007-2011, Australian Research Council)

as key personal in Germany and USA:

Babylon (2002-2004, DARPA), Avenue (2001-2003, NSF), Nespole! (2000-2002, EU) C-Star, Lingwear (DARPA), Verbmobil (1995-2000, BMBF).

Functions of Honor

Boards, Chairs, President

- since 2022 Member of the Board of Trustees Körber-Stiftung Deutscher Studienpreis
- since 2021 Member of the Board of Trustees of the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (IOSB)
- since 2020 Member of the Board of Trustees of the Fraunhofer Institut for Digital Media Technology (IDMT)
- since 2020 Chair of the Advisory Board of the UKRI Centre for Doctoral Training in Speech and Language Technologies, University of Sheffield, UK
- since 2017 Member of the ISCA Fellow Committee
- since 2016 Member of the ISCA International Advisory Board
- 2015-2021 Selection Committee member, Marsilius-Kolleg, Universität Heidelberg
external member appointed by the Rector
- 2013-2015 Elected President of the International Speech Communication Association
- 2007-2015 Member of the ISCA Board, International Speech Communication Association
(elected for four years, reelected 2011 for another four-years term)

Evaluation Panels and Committees

- Since 2020 Alexander von Humboldt, Germany
- Since 2015 Grant Evaluation Panels European Union
- Since 2014 Evaluation Panels BMBF, Germany
- 2011-2012 Chist-ERA Grants evaluation panels
- Since 2010 Reviewer to DFG, Germany
- Since 2009 Reviewer / Expert to SNF, Switzerland
- Since 2001 Reviewer and Evaluation Panels, National Science Foundation, USA
CRCNS panels, CAREER, IIS

Invited Panels and Expert Groups

- since 2022 Member of Committee to assess German higher education system, invited by the German Wissenschaftsrat
- since 2022 IEEE Signal Processing Society Distinguished Lecturer
- 2021 Invited Expert for the Research Assessment Exercise of KTH, Stockholm, Sweden
- 2021 Invited Expert of the German Ethics Council on the subject of AI and Human-Machine Interfaces
- 2020 Invited Expert at the International Workshop for Speech-to-Speech Machine Translation supported by Meity, Government of India
- 2020 Invited Expert at the Radcliffe Institute, Decoding Speech from Neural Signals
- 2020 Invited Expert at Dagstuhl seminar, cancelled
- 2017 Invited Expert at the BMBF future congress
- 2016 Invited Panelist at the Language Technology Industry Summit
- 2015- Expert for BMBF, EU, Deutscher Bundestag for various High-Tech Strategies on Man-Machine Interfaces, Berlin, Brüssel, Bonn.
- 2013 Invited Expert for NSF Video and Audio Resources (AARDVARC), NYC, New York, USA and Eastern Michigan University, USA

- 2011 Elected expert for the Zientzia Foroa, organized by Government Foundation Ikerbasque, Bilbao, Spain
- 2011 Invited Expert for "How will Biomedical Technology Enhance Human Life?" at BIOSTEC 2011, Rome, Italy
- 2010 Invited Expert for "Social Robotics" at International conference on Social Robotics, Singapore
- 2010 JSPS-DFG Round Table on "Cooperative Technology in Future: Cognitive Technical Systems", Tokyo, Japan
- 2009 Invited Expert on "Biosignals and Multimodal Information Fusion" at IEEE conference ICASSP, Taipei, Taiwan, April 2009.
- 2007-2008 Invited Expert on "Cognitive Systems – Future Steps" organized by InterLink, European Union ECRIM, Cannes, Nice, France
- 2007 Invited expert for „E-Language Learning" by The William and Flora Hewlett Foundation, California and China.
- 2005 Panel chair on subject: "Robust Speech Recognition – How to achieve it" at the DARPA Speech Translation project (GALE) kick-off, San Juan, CA.
- 2005 Invited Expert on the „Colloquium on Technology – Young Language Learners" by The William and Flora Hewlett Foundation, Menlo Park, CA.
- 2004 Panel expert on Language Processing Support Services, International Conference on Speech and Language Systems for Human Communication, Delhi, India.
- 2004 Invited expert on „Human Language Technologies - Development in South Africa", Kruger National Park, Skukuza, South-Africa.
- 2002-2004 Member of the Expert Technical Work Group on E-Language Learning, invited by the U.S. Department of Education within the scope of the U.S.-China E-Language Project. Group leader: "System Design, Development, and Evaluation".
- 2001 Expert Panel on *Portability of Automatic Speech Recognition Technology to new Languages*. Automatic Speech Recognition and Understanding (ASRU-2001), Madonna di Campiglio, Italy, December 2001.

Invited Extended Research Stays

- 2015 Taiwan three weeks: Academia Sinica and National Taiwan University Taipei, National Tsing-Hua University Hsinchu, National Cheng Kung University Tainan.
- 2014 India two weeks: IIIT and Winter School on Speech and Audio Processing - Deep Learning for Multi-Lingual Speech Processing, Hyderabad, India.
- 1996 Japan six weeks: Advanced Technologies Research (ATR), *Japanese Large Vocabulary Speech Recognition with Janus-3 Recognition Toolkit*. Kyoto, Japan.

Invited Talks and Tutorials

Tanja Schultz has given several hundred talks over the last 20 years with a focus on biosignal processing and multilingual speech recognition. She was invited as keynote speaker to many communities and countries in Europe (Austria, Belgium, Czech Republic, France, Germany, Greece, Italy, Malta, Polen, Portugal, Spain, Slovenia, Switzerland, Turkey, United Kingdom), USA and Canada, India, Asia (China, Japan, South Korea Singapore, Taiwan, Vietnam), Australia, and South-Africa and Egypt. Here, selected keynotes of the past five years are listed, many of which are available on youtube and other channels.

- 2022 Keynote speaker at the 4th International Conference on AI and Speech Technology, Delhi, India, virtual, December 2022
- 2022 Keynote speaker for the 10th anniversary of the Dept of Medical Physics & Acoustics, Faculty of Medicine and Health Sciences University of Oldenburg, July 2022.
- 2022 Plenary Speaker at the IEEE International Conference on Acoustics, Speech, & Signal Processing (ICASSP), Singapore, May 2022.
- 2022 Invited Speaker at gTec BCI & Neurotechnology Spring School, virtual, April 2022.
- 2022 Keynote Speaker at IEICE Signal Processing on Applied Acoustics and Speech Processing, Speech SIG of Information Processing Society Japan, virtual, March 2022.
- 2021 Invited Speaker to the University Zurich Lecture Series on Speech and Text Technology, virtual, December 2021.
- 2021 Invited Panel Speaker at the Online Podium discussion on “Krank laut KI – Wer übernimmt in Zukunft die Verantwortung für Diagnosen“, University Göttingen, virtual, December 2021.
- 2021 Keynote Speaker at the 3rd International Conference on Artificial Intelligence and Speech Technology (AIST), Indira Gandhi Delhi TU entitled “Beyond Acoustic Speech Communication, virtual, November 2021.
- 2021 Keynote Speaker at bidt Bayerisches Forschungsinstitut für Digitale Transformation, on Sprachkommunikationssysteme jenseits der Akustik, Munich, October 2021.
- 2021 Invited Speaker at TU Berlin “Biosignal-based Spoken Communication“, virtual, April.
- 2020 Invited Speaker on Brain-to-Text Neuro speech prosthesis, Radcliffe Institute for Advanced Study, Harvard University, Boston MA, virtual, September 2020.
- 2020 Invited Speaker at the CeTI Summer School 2020 (Center for Tactile Internet for Human-in-the-loop), talk on Biosignal Processing – Capturing, Recognition, and Interpretation for Cognitive Systems and Applications, virtual, August 2020.
- 2020 Invited ICASSP-ETON speaker, IEEE International Conference on Acoustics, Speech, and Signal Processing, talk on Biosignal-based Spoken Communication, Barcelona (virtual conference), May 2020.
- 2020 Keynote Speaker at Bremen AI, talk on Human-Maschine Interaction based on Biosignals, Bremen, February 2020.
- 2019 Keynote Speaker at ASRU (Automatic Speech Recognition and Understanding), talk on Biosignal-based Spoken Communication, Singapore, December 2019
- 2019 Invited Speaker at IROS Workshop on Semantic Policy and Action Representations, Biosignal Processing for Modeling Human Everyday Activities, Macau, November
- 2019 Invited Speaker at Futuras Res, Fraunhofer, Berlin, November 2019
- 2019 Keynote Speaker at Interspeech, Flagship conference of ISCA, Graz, September 2019
- 2019 Keynote Speaker at PETRA conferences, Rhodes, June 2019
- 2019 Invited speaker at HADF, Oldenburg, June 2019
- 2019 Invited demonstration of I-CARE at the Deutsche Ethikrat, Berlin, June 2019
- 2019 Invited speaker at Nutzerkongress, Düsseldorf, May 2019
- 2019 Invited speaker at CogSys, Osnabrück, January 2019
- 2018 Invited speaker and panelist at the Iberspech Conference, talk on Biosignal-based Spoken Communication, Barcelona, November 2018
- 2018 Invited speaker that Specom, Leipzig, September 2018
- 2018 Invited speaker at the KI Symposium on Cognitive Systems, Braunschweig, June 2018
- 2018 Invited Speaker at the AISV meeting of the Italian association for Speech Sciences, talk on Biosignal-based Spoken Communication Bozen, January 2018

Organisation of International Conferences and Workshops

2026	Local Co-Chair for IJCAI 2026 in Bremen, Germany
2023	Program Co-Chair InterConf on Multimodal Interaction (ICMI 2023), Paris
2022	Organizing Committee and Tutorial Chair ICASSP 2022, Singapore
2021	Technical Program Committee SPECOM, Speech and Computer, St. Petersburg
2020	Technical Program Committee Interspeech 2020, Shanghai/virtual
2019	Technical Program Committee ICMI 2019
2019	Program Committee SLSP Statistical Speech and Language Processing, Ljubljana
2019	Technical Program Committee BIOSIGNALS 2019
2019	Technical Program Committee Interspeech 2019, Graz
2018	Program Committee SLTU, Underresourced Languages 2018, Gurugram
2018	Program Committee Statistical Speech and Language Processing 2018, Mons
2018	Program Committee ITG Fachtagung Sprachkommunikation 2018, Oldenburg
2018	Program Committee BIOSIGNALS, PhyCS, ICPRAM
2018	Technical Program Committee Interspeech 2018, Hyderabad
2017	Technical Program Committee Interspeech 2017, Stockholm
2017	Program Committee BIOSIGNALS, PhyCS
2016	Technical Program Committee Interspeech 2016, San Francisco
2016	Program Committee BIOSIGNALS, PhyCS
2015	Technical Program Committee Interspeech 2015, Dresden
2015	Program Chair BIOSIGNALS
2014	Technical Program Chair BIOSIGNALS
2013	Technical Program Chair ASRU
2013	Technical Program Committee (Meta Area Chair) Interspeech 2013, Lyon
2012	Technical Program Committee (Area Chair), Interspeech 2012, Portland
2011	Technical Program Committee (Area Chair), Interspeech 2011, Italy
2010	Program Chair, KI 2010, Karlsruhe, Germany
2010	Technical Program Committee (Area Chair), Interspeech 2010, Japan
2010	Technical Program Committee (Reviewer), LREC
2010	Program Committee SLTU, Panang, Malaysia
2009	Technical Program Committee (Area Chair), Interspeech 2009, UK
2009	Program Committee (Technical Co-Chair), ASRU, Italy
2009	Technical Committee, (Reviewer), NIPS
2008	Workshop Chair, IWSLT 2008, Hawaii, US
2008	Demo Chair, SLT 2008, Goa, India
2008	Technical Program Committee (Area Chair), Interspeech 2008, Australia
2008	Program Committee ISUC 2008, Osaka, Japan
2008	Program Committee IS-LTC 2008, Ljubljana, Slovenia
2008	Program Committee CogSys, Karlsruhe, Germany
2008	Program Committee SLTU, Hanoi, Vietnam
2007	General Program Chair for Speech NAACL/HLT 2007
2007	Technical Committee (Reviewer) for Interspeech, EMNLP 2007, ICASSP 2007
2006	General Co-Chair Interspeech/ICSLP 2006
2006	Evaluator for the European Science Foundation, ESF-PESC, 2006
2006	Technical Committee (Reviewer) for ACL-Coling, EAACL 2006, ICASSP 2006
2006	Program Committee for KI 2006 (Artificial Intelligenz)

2006	Program Committee für Language Technologies Conference IS-LTC
2006	Program Committee for ESSLI (Resource-Scarce Language Engineering)
2006	Technical Committee (Reviewer) for NLP IASTED CI 2006
2006	Program Committee for HLT-Workshop in Medical Speech Translation
2005	Program Committee IWSLT (Workshop on Spoken Language Translation)
2005	Technical Committee for Eurospeech 2005
2005	Technical Committee for IJCAI 2005 (Conference on Artificial Intelligence)
2005	Invited Session Chair ICASSP and Technical Committee for ICASSP 2005
2004-2010	Member of the permanent committee of the International Conference on Signal, Speech, and Audio (PC-ICSLP), 6-year term
2004	Program Committee ICSLP 2004, Invited Session Chair for ICASSP 2004 for „Topics in Speaker and Language Recognition“
2003-2006	Member of the Organization Committee ICSLP 2006
2004	Organizer and Chair of the Special Session “Multilingual Speech Processing”, International Conference on Spoken Language Processing ICSLP 2004
2004	Technical Committee, International Conference on ICASSP 2004
2003	Invited Session Chair on ICASSP 2003
2002	International Conference on Multimodal Interfaces ICMI 2002
2002	Nominated for the IEEE Speech Technical Steering Committee
2001	Technical Committee, Human Language Technologies HLT 2001

Editorials

2022	Editor, Special Issue on Sensors for Human Activity Recognition, Sensors, MPDI
2021	Editorial Board of Neuroscience Applied, ECNP
2019	Lead Editor, Special Issue on Speech & Dementia, CSL
2017	Lead Editor, Special Issue on Biosignal-based Spoken Communication, IEEE Transaction on Audio, Speech, and Language Processing
2012	Guest Editor, Special Issue on Speech Processing for Low-Resource Languages, Speech Communication, Elsevier
Since 2010	Associate Editor of ACM Transactions on Asian Language Information Processing (TALIP)
2010	Guest Editor, Special Issue on Speech Translation, CSL Journal, Elsevier
2009	Guest Editor, Special Issue on Silent Speech Interfaces, Speech Communication, Elsevier
2009	Guest Editor, Morphological Rich Languages, IEEE Transaction on Audio, Speech, and Language Processing
Since 2005	Reviewer for the Journal of Artificial Intelligence Research
Since 2004	Editorial Board Member for Speech Communication, Elsevier
2002-2004	Associate Editor for the IEEE Transactions on Speech and Audio Processing
Since 2004	Reviewer for the Journal Computer, Speech and Language
Since 2004	Reviewer for the Iranian Journal of Electrical and Computer Engineering
Since 2004	Reviewer for the South-African Computer Journal
Since 1999	Reviewer for the Journal of „Speech Communication“
Since 1999	Reviewer for the IEEE Transactions on Speech and Audio Processing

Membership in Professional Societies

- Since 2022 Member of Association for Computing Machinery (ACM)
- Since 2017 Member (and Fellow) of the European Academy of Sciences and Arts
- Since 2015 Member of the Brain Computer Interface Society (BCI Society)
- Since 2001 Member of the Association for Computational Linguistics (ACL)
- Since 2000 Member of the Institute of Electrical and Electronic Engineers (IEEE)
(2017 Senior Member, 2020 Fellow)
- Since 1999 Member of the International Speech Communication Association (ISCA)
(2016 Fellow)
- Since 1993 Member of the European Language Resources Association (ELRA)
- Since 1990 Member of the Society of Computer Science (Gesellschaft für Informatik)

Consulting

- Since 2008 Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (IOSB), consulting expert on Biosignal Capturing, Processing, and Interpretation for man-machine interfaces.
- 2010-2017 Hector School of Engineering and Management, Master Program for Green Mobility, Lecturer for Human Behavior Modeling, Karlsruhe.
- 2012-2014 Consulting for Amazon, Multilingual Speech Technologies
- 2003 Mobile Technologies, LLC. Development of software and generation of pronunciation dictionaries in English language spoken by native and non-native speakers for the purpose of speech recognition.
- 2003 Cepstral, LLC. Service for the development of speech synthesis for German and non-native English language.
- 2002-2004 Northrop Grumman. Scientific and technical service for the design, development, and implementation of a web-based, distance learning education program for children to learn English as a second language.

Service and Department Committee Work

Departmental Responsibilities, Computer Science, University of Bremen

- Since 2019 Host and Co-Organizer of MindTalks, a lecture series funded by “Iris und Hartmut Jürgens Stiftung. Jointly with Profs. Udo Ernst and Olivia Masseck
- Since 2016 Host and Organizer of the Bremen Big Data Challenge, a yearly competition event for students
- 2015-2020 Internationalisation, Representative of Faculty 3

Departmental Responsibilities, Computer Science Department, KIT

- 2013-2015 Member of the Council for Research and Promotion of Young Scientists (CRYS)
- 2008-2015 Member of the Doctoral Degree Committee, Department for Informatics

Departmental Responsibilities, Language Technologies Institute, CMU

- 2001-2003 Member of Admissions Committee

Departmental Responsibilities, Computer Science, University of Karlsruhe

- 1998-2000 Departmental Representative to Graduate Students and Staff, Karlsruhe, Germany.
- 1996-2000 Departmental Representative to Female Students, Karlsruhe, Germany.

Promotion of Young Talents / Student Advising

Tanja Schultz has led 20 doctoral students to their doctorates as first advisor and over 40 doctoral students as second advisor or external examiner. Her PhD students became professors (6 out of the 20 first-advisor students as of today), technical leaders in industry, or researchers at universities and research labs.

Current PhD students

Uni Bremen, main advisor:

- Lars Steinert “Engagement Recognition, Dementia” (defense planned by 4/2023),
- Moritz Meier “Human Activity Modeling” (planned 8/2023),
- Daniel Reich “Visually grounded Question Answering” (planned 9/2023),
- Ay Abulimiti “Speech-based Dementia Screening” (planned 2023),
- Kevin Scheck “Silent Speech with Deep Learning Methods” (planned 2024),
- Marvin Borsdorf “Multiparty Speaker Separation” (with Haizhou Li, planned 2024),
- Yale Hartmann “Multimodal Human Activity Recognition” (planned 2025),
- Darius Ivucic “Neuro Speech Prosthesis” (planned 2026),
- Gabriel Ivucic “Auditory Attention Decoding” (planned 2026),
- Abdul Haq “Cognitive Control of Social Resonance” (planned 2026),
- Elisa Brauße “Early Detection of Dementia via Speech+MRT” (planned 2026),
- Rathi Adarshi Rammonhan “Detecting Hatespeech” (planned 2026),
- Saurav Pahuja “Auditory Attention Modeling with DNNs” (planned 2027),
- Rinu Elisabeth Paul “Frailty Prediction from Gait Recognition” (planned 2027);

External, main advisor / co-advised:

- Sreeja Manghat “Code-Switching in Malayalam” (planned 2023),
- Catarina Botelho “Speech as Biomarker for Diseases” (co-advisor planned 2023),
- Pantea Kock “Prediction of Falls in Care Recipients” (co-advisor planned 2025)

Completed PhD students

2022: Lisa-Marie Vortmann (Uni Bremen, main advisor), Florian Ahrens (Uni Bremen, second advisor)

2021: Miguel Angrick (Uni Bremen, main advisor), Hui Liu (Uni Bremen, main advisor), Lorenz Diener (Uni Bremen, main advisor), Mazen Salous (Uni Bremen, main advisor), Konrad Gadzicki (Uni Bremen, second advisor), Joana Correia (CMU, thesis committee)

2020: Chenglin Xu (Nanyang Technology University, Examiner), Fabian Honecker (Bundeswehr Uni München, second advisor)

2019: Hakim Si Mohammed (INSA/INRIA Rennes, Examiner), Tobias de Taillez (Uni Oldenburg, second advisor), Bahman Mirheidari (Uni Sheffield, External examiner), Berthold Bäumlner (Uni Bremen, committee member)

2018: Marina Zimmermann (EPFL, Thesis Committee)

2017: Vivian Mast (Uni Bremen, Thesis Committee), Daniel Nyga (Uni Bremen, Thesis Committee); Florent Bocquet (Universite Grenoble Alpes Frankreich, External Examiner)

2016: Matthias Janke (KIT, main advisor), Christian Herff (Bremen, main advisor; **Assistant Professor** at Maastricht University), Mathias Landhäußer (KIT, second advisor)

- 2015: Dirk Gehrig (KIT, main advisor), Christoph Amma (KIT, main advisor), Dominic Heger (KIT, main advisor), Dominic Telaar (KIT, main advisor), Sabine Weyand (University of Toronto, external examiner), Joao Miranda (Carnegie Mellon, Thesis committee)
- 2014: Michael Wand (KIT, main advisor; **Assistant Professor** at IDSIA/SUPSI, Switzerland), Thang Ngoc Vu (KIT, main advisor; **Full Professor** at Stuttgart University); Felix Putze (KIT, main advisor), Tim Schlippe (KIT, main advisor; **Full Professor** at IU International University of Applied Sciences), Tim Pozehl (TU Berlin, external examiner), Arseniy Gorin (Universite Lorraine, external examiner), Thiago Fraga (Universite Paris Sud, external examiner)
- 2013: Udhay Nallasamy (CMU, Main advisor, Thesis Committee Chair); David Imseng (EPFL/IDIAP, Schweiz, second advisor)
- 2012: Roger Hsiao (CMU, Main advisor, Thesis Committee Chair); Farzaneh Ahmadi (Nanyang Technological University, Singapur, External Examiner), Hui Liang (EPFL/IDIAP Lausanne, Switzerland, Rapporteur)
- 2011: Hanno Harland (KIT, second advisor), Stephan Heuer (KIT, second advisor), Andreas Sandmair (KIT, second advisor), Kornel Laskowski (CMU, Thesis Committee), Tong Rong (NTU, Singapore, External Examiner)
- 2010: Matthias Paulik (KIT, second advisor), Sopheap Seng (LIG, Grenoble, Frankreich, Rapporteur), Kishore Prahallad (CMU, Thesis Committee)
- 2009: Wilson (Yik-Cheung) Tam (CMU, Main advisor, Thesis Committee Chair; **Full Professor** at NYU Shanghai), Sebastian Stüker (KIT, second advisor), Rania Bayeh (l'École Nationale Supérieure des Télécommunications, Paris, Rapporteur)
- 2008: Stan (Szu-Chen) Jou (CMU, Main advisor, Thesis Committee Chair), Matthias Eck (KIT, Ko-Referat), Christian Fügen (KIT, second advisor), Alex Fexa (KIT, second advisor), John Kominek (CMU, Thesis Committee), Ciro Martins (Universidade de Aveiro, Portugal, External Examiner)
- 2007: Qin Jin (CMU, Main advisor; **Full Professor** at Renmin University), Girija Chetty (University of Canberra, Australia, External Examiner), Stephen Choularton (Macquarie University, Sydney Australia, External Examiner)
- 2000-2007: Yue Pan (CMU, Committee Member), Rong Zhang (CMU, Committee Member), Fei Huang (CMU, Committee Member), Hua Yu (CMU, Committee Member), Laura Tomokyo Mayfield (CMU, Committee Member)

Current and former Post-Docs

- Felix Putze (Uni Bremen, permanent position),
- Dennis Küster (Uni Bremen, permanent position),
- Hanna Voudouri (Uni Bremen, Executive Manager Minds, Media, Machines),
- Mazen Salous (since 2021),
- Hui Liu (since 2021),
- Rafael Reisenhofer (since 2022),
- Stephan Verschoor (since 2022),
- Zhao Ren (starting 3/2023)
- Faramarz Faghihi (2019-2021, Uni Bremen),
- Sromona Chatterjee (2019-2020, Uni Bremen),
- Christian Herff (2016-2018, Uni Bremen),
- Arthur Toth (2008, CMU),
- Dau-Cheng Lyu (2010, I2R),

- Keigo Nakamura (2011, NAIST)
- Ian Lane (2004-2006, CMU)
- Mark Fuhs (2005-2006, CMU)

Habilitations

- Claude Barras (2011, LIMS CRNS),
- Robert Porzel (2022, Uni Bremen iP)

Completed MS.C. Students

- Since 2015: About 80 Bachelor and Master Theses at Cognitive Systems Lab (University of Bremen)
- 2007-2015: About 120 Bachelor and Master Theses at Cognitive Systems Lab (Karlsruher Institut of Technology)
- 2000-2007: At Carnegie Mellon University
- graduated MS.C. students: Sameer Badaskar, Roger Hsiao, Sharath Rao, Shirin Saleem, Sinaporn Suebvisai, Zhirong Wang
 - advised research programmer and other staff
 - InterACT Masters Student (10, co-advised with Germany): Jan Calliess, Marek Wester, Aneliya Mircheva, Lena Maier-Hein, Matthias Honal, Michael Katzenmaier, Matthias Paulik, Mirjam Killer, Jamal Abu-Alwan, Michael Wand.

Teaching

Material, scripts, and slides are online available at <http://csl.uni-bremen.de>.

Teaching at University Bremen (since 10/2015)

Co-Initiator and leader of a news Master's program in AI: A new Master of Science program in "Artificial Intelligences and Intelligent Systems (AIIS)" at the Faculty 3 – Mathematics and Informatics of the University of Bremen has been proposed. It is designed to give international students a comprehensive framework for AI in one of the three areas cognition-enabled robots, machine learning and data science, and cognitive systems. The accreditation process is under way.

Bremen Big Data Challenge (BBDC): To increase interest in practical applications of machine learning methods, the CSL team initiated the Bremen Big Data Challenge, a yearly 4week-challenge for students that takes place at Bremen University since 2016. The first BBDC of March 2016 had 24 competing teams, the third BBDC in March 2018 had 77 teams. Newsletters reach over 600 people.

New Bachelor and Master courses at established in machine learning, signal processing, and biosignal-adaptive cognitive systems in the "Artificial Intelligence, Cognition and Robotics (KIKR)" area, basic courses on identified gaps in signal processing, machine learning, and technical cognitive systems, new courses were created and started.

Course	Typ, SWS	CP	Semester
Advanced Machine Learning	Master, Lectures 2+1	6	Since SS 2021
Sensor Data Processing	Bachelor, Lectures 2	6	Since WS 2019/20
Fundamentals of Machine Learning	Bachelor, Lecture 2	6	Since SS 2017
Biosignals and Interfaces	Bachelor, Lecture 3+1	6	Since SS 2016
Bremen Big Data Challenge	Challenge, Seminar 2	3	Since SS 2016
Automatic Speech Recognition	Master, Lecture 3+1	6	Since WS 2015/16
Praxis of Brain Pattern Recognition	Bachelor, Lecture 2	3	Since WS 2015/16
LabLinking VR	Bachelor Project	18	SS+WS 2022
Bioguitar	Bachelor Project	18	SS+WS 2021
IRPAM	Master Project	8	WS+SS 2021
Roborinth	Master Project	8	WS+SS 2020
HoloAI	Bachelor Project	18	SS+WS 2019
BOWSR 2.0	Master Project	8	WS+SS 2019
Build your own ASR (BOWSR)	Bachelor Project	3	SS+WS 2018
AR/VR	Master Project	3	WS+SS 2018
Biosignal-based Butler	Bachelor Project	18	SS+WS 2016
User Modeling for interaction	Master, Lecture 2	3	SS 2016

Teaching at Karlsruhe Institute of Technology, KIT (2007-03/2015)

Undergrad Courses at KIT (orientation examinations in Informatics) with 890 (WS2011/12) and 1050 (WS2012/13) student attendees, tutorials taught by 40 teaching assistants; 7 newly developed lecture courses, 2 seminars, 4 hands-on practical courses for the bachelor and master program at KIT in the special areas of „Anthropomatics“ and „Cognitive Systems“ in computer science with a particular emphasis on the recording, processing, and interpretation of biosignals for intuitive human-machine interfaces. Such as Multilinguale Mensch-Maschine Kommunikation (lecture, 6 CP), Biosignale und Benutzerschnittstellen (6 CP), Modellierung Menschlicher Bewegungen (lecture, 2CP), Multilingual Speech Processing (hands on, 2 CP), Technical Cognitive Systems (lecture, 2CP).

Joint Teaching at University Bremen and KIT (since 4/2022)

In the framework of the DFG GRK KD2School, an interdisciplinary research training program funded by DFG, a joint course was established on “Biosignal-adaptive Systems”, it has been taught jointly with former colleagues at KIT and becomes an integral part of the interdisciplinary Master’s and PhD training at KIT and Bremen University.

Teaching at Carnegie Mellon University (2001-2007)

Speech Processing Seminar Series, Lecture Series for Masters and Ph.D. Students at the Language Technologies Institute; Multilingual Speech-to-Speech Translation, Seminar and Laboratory for Master and Ph.D. students; Speech Recognition and Understanding, Core course for Master and Ph.D. students at the Language Technologies Institute; Advanced Speech Laboratory, Advanced Hands-on Lab for Master and Ph.D. Students.

Teaching at University Heidelberg (1986-1990)

1986 – 1990 EDV-Courses for Statistical Methods in Social Science (toolkits such as SPSS and SAS) for Master and Ph.D. students of Sport and Physical Education.