

Philipp T. Tempel | Doctor of Engineering Engineering Cybernetics

✉ philipp.tempel@ieee.org • 🌐 philipptempel.me • 🐙 philipptempel • 🐙 philipptempel
in philipptempel • 🏠 IB9CABQAAAAJ • 🆔 0000-0003-2424-2007

- Well-rounded automation and robotics engineer with expertise in robot design and real-time control, experimental validation, research dissemination, and personnel management
- Interested in automated design and learning-based control of autonomous robots at the interface of safe human-robot collaboration and flexible robots with a focus on industrial and clinical applications

Education

Graduate School Simulation Technology (Cluster of Excellence EXC 310) **Stuttgart, Germany**
Doctor of Engineering (Doktoringenieur), magna cum laude *Jul. 2015–Jul. 2019*
thesis title Dynamics of Cable-Driven Parallel Robots with Elastic and Flexible, Time-Varying Length Cables
advisors Andreas Pott, Bernhard Haasdonk, Remco I. Leine
description Developed and validated model based on Cosserat theory of elastic bodies to include full cable dynamics in simulation, analysis, and control of cable-driven parallel robots

University of Stuttgart **Stuttgart, Germany**
Graduate Engineer (Diplomingenieur) Engineering Cybernetics, very good *Oct. 2007–Mar. 2013*
thesis title A Novel Way to Learning to Fly Quadrotors Using a Force Feedback Joystick
supervisors Sunil K. Agrawal, Oliver Sawodny
description Developed an impedance control in force feedback joystick to facilitate drone control
specialization optical systems; model predictive control; nonlinear and optimal control; biomedical engineering;

Research Experience

Laboratory of Digital Sciences of Nantes LS2N **Nantes, France**
Postdoctoral Research Associate *Nov. 2020–Oct. 2023*

- Head of task force *Continuum Parallel Robotics*;
- Managed ARMEN team's monthly scientific seminars;
- Co-supervised two PhD students and supervised one MSc student;

MAMBO: Manipulation of Soft Bodies by Multiples Drones *Sep. 2021–Oct. 2023*

- Developed low-dimensional model of flexible slender continuum bodies actuated by discrete wrenches at their extremities;
- Developed geometric controller to deform the slender bodies and move along spatial trajectories;
- Developed extended Kalman filter for state estimation of flexible slender continuum bodies;

COSSEROOTS: Cosserat Theory for Slender Robots *Sep. 2021–Oct. 2023*

- Developed Lie-algebra framework for the calculation of statics and dynamics of hybrid rigid–soft multibody systems;
- Published framework as open-source MATLAB Toolbox *COSSEROOTS* and ROS2 nodes;

ECO-DESIGN: Eco-Friendly Design of Continuum Structures and Robots *Nov. 2020–Aug. 2021*

- Developed model structure, mathematical framework, and non-linear optimization methods;
- Built simple planar stiffness-optimal parallel continuum structure to confirm theory;

Delft University of Technology **Delft, Netherlands**
Postdoctoral Research Associate *Oct. 2019–Sep. 2020*

- Supervised two MSc students and one group of four BSc students;

CARISA: Cable Robot for the Inspection and Scanning of Artwork *Oct. 2019–Sep. 2020*

- Built and designed cable robot *CARISA* from scratch using my *CDPyR* python-package and SolidWorks;
- Performed robot accuracy and repeatability experiments using a microscope mounted on the end effector;
- Developed version 2 of python package *CDPyR* for design and analysis of cable robots;
- Developed open-source control platform *TwinCATdpr* for cable robots based on TwinCAT by Beckhoff;

University of Stuttgart **Stuttgart, Germany**
Research Associate *Apr. 2013–Sep. 2019*

- Taught courses on robot dynamics and control, on automation solutions, and on research-focused software development;
- Defined the department's teaching paradigm on design of lab sessions and hands-on sessions;
- Supervised 12 MSc students and 11 BSc students;

- ENDLESS-Z:** *Kinematic Modeling of Cable-Driven Parallel Robots with Unlimited Rotational Axis* Aug. 2017–Jul. 2019
- Developed mathematical model of cable robots with endless rotation;
 - Derived algorithms for efficient calculation of workspace boundaries and robot stiffness;
- FORZDM:** *Integrated Zero Defect Manufacturing Solution for High Value Adding Multi-Stage Manufacturing Systems* Oct. 2016–Sep. 2019
- Created a parametric model of a rotor shaft axle and a stream-of-variation model of the manufacturing system;
 - Implemented learning-based compensation strategies for downstream error compensation using pytorch;
- CARoCTRLCONF:** *Development of a Method and Strategy for On-Line Reconfiguration of Cable-Driven Parallel Robots as Handling Devices* Feb. 2017–Jan. 2019
- Developed symbolic-numeric method to calculate geometric reconfiguration of planar cable robots;
- PN3-7:** *Improved Modeling of Kinematics and Dynamics of Light-Weight Parallel Robots* Jan. 2014–Dec. 2018
- Experimentally validated cable elasticity model based on standard linear solid model;
 - Built COPACABANA cable robot as validation and test bed for my research;
 - Derived and validated cable dynamics model based on Cosserat theory of elastic bodies;
 - Estimated in experiments inertial and mechanical parameters of cable robots CoGiRO, COPACABANA, IPANEMA;
 - Implemented real-time motion control and real-time workspace calculation of cable robots in C/C++ and ROS;
 - Implemented design and analysis algorithms of cable robots in GUI software *WireCenter* in C/C++ 11;
 - Created and validated general-purpose MATLAB/Simulink real-time simulation toolbox *CDPRlab* for cable robots;
 - Collaborated with Fraunhofer IPA on industrialization of cable robot technology and industrial use cases;
 - Developed python package *CDPyR* for design and analysis of cable robots;
 - Joined Joint Robotics Laboratory, Chonnam National University, Gwangju, Republic of Korea as invited researcher;
 - Joined Laboratory of Informatics, Robotics and Microelectronics of Montpellier, France as visiting researcher;
- FASTSTORAGEBW2:** *Development of a Hybrid System of Battery and Capacitor* Oct. 2015–Dec. 2017
- Managed field trials of industry partners, including design iteration, trial planning, and performance evaluation;
 - Verified sufficient energy providing and recuperation through experiments on automated storage and retrieval systems;
- CONTROLCABINET4.0:** *Automation and Digitization in Manufacturing of Control Cabinets* Sep. 2016–May. 2017
- Conducted survey through questionnaire and on-site visits;
 - Identified digital twin and automated cable routing as ideal contender for automation;
 - Derived use-case for robot-based cable routing for the IRTG 2198 Soft Tissue Robotics S-1/II;
- BEEEYECARo:** *Cable Robots for the German Pavilion at World Expo 2015 in Milan, Italy* Apr. 2014–Mar. 2015
- Designed two cable robots in consultation with architects to ensure safety standard-compliant design of event space;
 - Developed and tested safety of the robots' real-time motion control software;
 - Developed software using Blender and Python for artists to program robot motion more intuitively;
- OTOlab:** *Design and Implementation of Lab Session for Measurement of Otoacoustic Emissions and Electrical Impedance Tomography* May.–Dec. 2013
- Developed didactic plan for lab session on the use of various otoacoustic measuring devices;
 - Supervised the lab session for several groups of up to 4 masters students;
 - Created software for simplified measurement of data using dSPACE and LabView;
 - Developed a web-based app to manage student activities and theses in PHP;

Research Visits

- Laboratory of Informatics, Robotics and Microelectronics of Montpellier** Montpellier, France
Guest researcher Mar.–Jun. 2016
- Validated enhanced simulation model of suspended under-constrained cable robots;
 - Performed inertial parameter estimation of a suspended under-constrained cable robot;
 - Improved motion planner accuracy by incorporating cable mass into model;
- Robotics Research Initiative RRI, Chonnam National University CNU** Gwangju, Korea
Invited researcher Apr.–Jun. 2014
- Designed and built cable robots for manipulation tasks and for motion simulation;
 - Performed operational safety checks of cable robot;
- University of Delaware** Newark, DE, USA
Exchange student May. 2012–Jan. 2013
- Conducted experiments with subjects on drone control training through a force-feedback joystick;
 - Assisted in experiments on gait training using exoskeleton *ALEX II*;

Grants

2017: Kinematic Modeling of Cable-Driven Parallel Robots with Unlimited Rotational Axis (Endless-Z): Deutsche Forschungsgemeinschaft DFG (German Research Foundation), 246 k€

2016: Development of a Method and Strategy for On-Line Reconfiguration of Cable-Driven Parallel Robots as Handling Devices (CaRoCtrlConf): Deutsche Forschungsgemeinschaft DFG (German Research Foundation), 195 k€

Teaching Experience

Modeling, Analysis, and Design of New Robot Kinematics

graduate level, lecture and tutorials

Fundamentals of rigid body dynamics, robot design and control, workspace analysis, and computational methods.

University of Stuttgart

Oct. 2015–Mar. 2019

Planning of Robotic Systems

graduate level, lecture

Concepts of process automation, choice of robots, and safety and operational considerations.

University of Stuttgart

Oct. 2017–Mar. 2019

Development of Scientific and Technical Software

graduate level, lecture and coding classes

Develop software for research, design patterns, software architecture, version control, and code generation.

University of Stuttgart

Apr. 2017–Sep. 2018

Closed-loop Control of a Feed Axes using MATLAB and Simulink

undergraduate level, lab session

Linear PID control laws, controller parametrization and stability, cascaded control, and state feedback.

University of Stuttgart

Oct. 2014–Mar. 2019

Publications

Books

P. Tempel, *Dynamics of Cable-Driven Parallel Robots with Elastic and Flexible, Time-Varying Length Cables* (Stuttgarter Beiträge zur Produktionsforschung). Stuttgart: Fraunhofer Verlag, 2019, vol. 94, ISBN: 978-3-8396-1536-2. DOI: 10.18419/opus-10818

Peer Reviewed Articles

M. Alfeld, **P. Tempel**, and V. van der Wijk, "Cable robots as conventional linear stage alternatives for the investigation of complex-shaped objects via macroscopic x-ray fluorescence imaging," *Quantum Beam Science*, vol. 7, no. 4, p. 37, Nov. 2023, ISSN: 2412-382X. DOI: 10.3390/qubs7040037

F. Boyer, A. Gotelli, **P. T. Tempel**, V. Lebastard, F. Renda, and S. Briot, "Implicit time integration simulation of robots with rigid bodies and cosserat rods based on a newton-euler recursive algorithm," *IEEE Transactions on Robotics*, pp. 1–20, 2023, ISSN: 1941-0468. DOI: 10.1109/TR0.2023.3334647 early access.

P. T. Tempel and S. Briot, "Geometric deformation control of passive flexible slender bodies," *ASME Journal of Mechanisms and Robotics*, 2023, in preparation.

F. Eger, S. Oechsle, C. Reiff, M. C. Magnanini, **P. Tempel**, A. Lechler, A. Verl, and M. Colledani, "Part variation modeling to avoid scrap parts in multi-stage production systems," *Procedia CIRP*, vol. 107, pp. 851–856, 2022. DOI: 10.1016/j.procir.2022.05.074

F. Eger, C. Reiff, **P. Tempel**, M. C. Magnanini, D. Caputo, A. Lechler, and A. W. Verl, "Reaching zero-defect manufacturing by compensation of dimensional deviations in the manufacturing of rotating hollow parts," *Procedia Manufacturing*, vol. 51, pp. 388–393, 2020. DOI: 10.1016/j.promfg.2020.10.055

C. Reiff, F. Eger, **P. Tempel**, M. C. Magnanini, J. A. Ortiz, M. Colledani, A. Verl, and I. Sarries, "Smart centering for rotation-symmetric parts in multi-stage production systems for zero-defect manufacturing," *Procedia CIRP*, vol. 79, pp. 27–32, 2019, ISSN: 2212-8271. DOI: 10.1016/j.procir.2019.02.006

J. Port, Z. Tao, A. Junger, C. Joppek, **P. Tempel**, K. Husemann, F. Singer, P. Latzin, S. Yammine, J. H. Nagel, and M. Kohlhäufel, "A simple method to reconstruct the molar mass signal of respiratory gas to assess small airways with a double-tracer gas single-breath washout," *Medical & biological engineering & computing*, vol. 55, no. 11, pp. 1975–1987, 2017. DOI: 10.1007/s11517-017-1633-y eprint: 28357624.

P. Tempel and A. Pott, "Parallele Seilroboter in Theorie und Praxis, Leichtbau, Energieeffizienz und hohe Dynamiken als Potential, Elastizität als Hauptherausforderung," *wt Werkstatttechnik online*, vol. 106, no. 9, pp. 643–647, 2016, ISSN: 1436-4980.

P. Tempel, P. Miermeister, A. Lechler, and A. Pott, "Modelling of kinematics and dynamics of the IPAnema 3 cable robot for simulative analysis," *Applied Mechanics and Materials*, vol. 794, pp. 419–426, 2015, ISSN: 1662-7482. DOI: 10.4028/www.scientific.net/AMM.794.419

P. Tempel, F. Schnelle, A. Pott, and P. Eberhard, "Design and programming for cable-driven parallel robots in the German pavilion at the EXPO 2015," *Machines*, vol. 3, no. 3, pp. 223–241, 2015, ISSN: 2075-1702. DOI: 10.3390/machines3030223

Peer Reviewed Conference Proceedings.....

P. Tempel, F. Boyer, S. Briot, P. R. Giordano, and A. Chriette, "Simulating the manipulation of flexible bodies through drones," in *Proceedings of the Workshop "New Frontiers of Parallel Robotics"*, IEEE International Conference on Robotics and Automation (ICRA) (Pennsylvania Convention Center, May 23–27, 2022), Philadelphia, PA, USA, May 27, 2022.

M. Alfeld, **P. Tempel**, and V. van der Wijk, "CaRISA, Eine Seilroboter-basierte Kameraplattform für die Untersuchung dreidimensionaler Kunstobjekte," in *Archäometrie und Denkmalpflege 2021*, (Bochum, Germany, Mar. 17–19, 2021), S. Klein, F. Schlütter, S. Greiff, and A. Kronz, Eds., ser. METALLA, 2021.

P. Tempel, M. Alfeld, and V. van der Wijk, "Design and analysis of cable-driven parallel robot CaRISA, A cable robot for inspecting and scanning artwork," in *ROMANSY 23, Robot Design, Dynamics and Control*, Proceedings of the 3rd CISM IFToMM Symposium (Sapporo, Japan, Sep. 20–24, 2020), G. Venture, J. Solis, Y. Takeda, and A. Konno, Eds., ser. CISM International Centre for Mechanical Sciences, vol. 601, Cham: Springer, 2021, pp. 136–144. DOI: 10.1007/978-3-030-58380-4_17

T. Reichenbach, **P. Tempel**, A. Verl, and A. Pott, "On kinetostatics and workspace analysis of multi-platform cable-driven parallel robots with unlimited rotation," in *Robotics and Mechatronics (ISRM 2019)*, Proceedings of the 6th IFToMM International Symposium on (Taipei, Taiwan, Oct. 28–30, 2019), C.-H. Kuo, P.-C. Lin, T. Essomba, and G.-C. Chen, Eds., ser. Mechanisms and Machine Science, vol. 78, Cham: Springer, 2020, pp. 79–90. DOI: 10.1007/978-3-030-30036-4_7

F. Trautwein, T. Reichenbach, **P. Tempel**, A. Pott, and A. Verl, "COPacabana, Ein modularer paralleler Seilroboter," in *Sechste IFToMM D-A-CH Konferenz 2020*, (Lienz, Austria, Feb. 27–28, 2020), M. Pfurner and F. Dohnal, Eds., 2020, ISBN: 978-3-940402-28-8. DOI: 10.17185/uepublico/71189

F. Eger, **P. Tempel**, M. C. Magnanini, C. Reiff, M. Colledani, and A. Verl, "Part variation modeling in multi-stage production systems for zero-defect manufacturing," in *Industrial Technology (ICIT 2019)*, 2019 IEEE International Conference on (Melbourne, VIC, Australia, Feb. 13–15, 2019), IEEE, 2019, pp. 1017–1022. DOI: 10.1109/ICIT.2019.8754964

A. Pott and **P. Tempel**, "A unified approach to forward kinematics for cable-driven parallel robots based on energy," in *Advances in Robot Kinematics (ARK 2018)*, Proceedings of the 2018 16th International Symposium on (Bologna, Italy, Jul. 1–5, 2018), J. Lenarčič and V. Parenti-Castelli, Eds., ser. Springer Proceedings in Advanced Robotics, vol. 8, Cham: Springer, 2019, pp. 401–409, ISBN: 978-3-319-93187-6. DOI: 10.1007/978-3-319-93188-3_46

A. Pott, **P. Tempel**, A. Verl, and F. Wulle, "Design, implementation and long-term running experiences of the cable-driven parallel robot CaRo printer," in *Cable-Driven Parallel Robots (CableCon 2019)*, Proceedings of the Fourth International Conference on (Krakow, Poland, Jul. 1–4, 2019), A. Pott and T. Bruckmann, Eds., ser. Mechanisms and Machine Science, vol. 74, Cham: Springer, 2019, ISBN: 978-3-030-20750-2. DOI: 10.1007/978-3-030-20751-9_32

T. Reichenbach, **P. Tempel**, A. Verl, and A. Pott, "Static analysis of a two-platform planar cable-driven parallel robot with unlimited rotation," in *Cable-Driven Parallel Robots (CableCon 2019)*, Proceedings of the Fourth International Conference on (Krakow, Poland, Jul. 1–4, 2019), A. Pott and T. Bruckmann, Eds., ser. Mechanisms and Machine Science, vol. 74, Cham: Springer, 2019, ISBN: 978-3-030-20750-2. DOI: 10.1007/978-3-030-20751-9_11

P. Tempel, D. Lee, F. Trautwein, and A. Pott, "Modeling of elastic-flexible cables with time-varying length for cable-driven parallel robots," in *Cable-Driven Parallel Robots (CableCon 2019)*, Proceedings of the Fourth International Conference on (Krakow, Poland, Jul. 1–4, 2019), A. Pott and T. Bruckmann, Eds., ser. Mechanisms and Machine Science, vol. 74, Cham: Springer, 2019, pp. 295–306, ISBN: 978-3-030-20750-2. DOI: 10.1007/978-3-030-20751-9_25

P. Tempel, F. Trautwein, and A. Pott, "Experimental identification of stress-strain material models of UHMWPE fiber cables for improving cable tension control strategies," in *Advances in Robot Kinematics (ARK 2018)*, Proceedings of the 2018 16th International Symposium on (Bologna, Italy, Jul. 1–5, 2018), J. Lenarčič and V. Parenti-Castelli, Eds., ser. Springer Proceedings in Advanced Robotics, vol. 8, Cham: Springer, 2019, pp. 258–265, ISBN: 978-3-319-93187-6. DOI: 10.1007/978-3-319-93188-3_30

P. Tempel, A. Schmidt, B. Haasdonk, and A. Pott, "Application of the rigid finite element method to the simulation of cable-driven parallel robots," in *Computational Kinematics (CK 2017)*, Proceedings of the 7th International Workshop on (Futuroscope-Poitiers, France, May 22–24, 2017), S. Zeghloul, L. Romdhane, and M. A. Laribi, Eds., ser. Mechanisms and Machine Science, Cham: Springer, 2018, pp. 198–205, ISBN: 978-3-319-60867-9. DOI: 10.1007/978-3-319-60867-9_23

F. Trautwein, **P. Tempel**, and A. Pott, "A symbolic-numeric method to capture the impact of varied geometrical parameters on the translational workspace of a planar cable-driven parallel robot," in *Reconfigurable Mechanisms and Robots (ReMAR)*, 2018 IEEE International Conference on (Delft, Netherlands, Jun. 20–22, 2018), J. L. Herder and V. van der Wijk, Eds., Piscataway, NJ: IEEE, 2018, pp. 1–7, ISBN: 978-1-5386-6380-6. DOI: 10.1109/REMAR.2018.8449891

P. Tempel, P.-E. Hervé, O. Tempier, M. Gouttefarde, and A. Pott, "Estimating inertial parameters of suspended cable-driven parallel robots, Use case on CoGiRo," in *Robotics and Automation (ICRA 2017)*, 2017 IEEE/RAS International Conference on (Singapore, Singapore, May 29–Jun. 3, 2017), IEEE, 2017, pp. 6093–6098, ISBN: 978-1-5090-4633-1. DOI: 10.1109/ICRA.2017.7989723

P. Tempel, A. Verl, and A. Pott, "On the dynamics and emergency stop behavior of cable-driven parallel robots," in *ROMANSY 21, Robot Design, Dynamics and Control*, Proceedings of the 21st CISM-IFTToMM Symposium (Udine, Italy, Jun. 20–30, 2016), V. Parenti-Castelli and W. Schiehlen, Eds., ser. CISM International Centre for Mechanical Sciences, vol. 569, Cham: Springer, 2016, pp. 431–438, ISBN: 978-3-319-33713-5. DOI: 10.1007/978-3-319-33714-2_48

P. Tempel, P. Miermeister, and A. Pott, "Kinematics and dynamics modeling for real-time simulation of the cable-driven parallel robot IPAnema 3," in *Mechanism and Machine Science 2015*, Proceedings of the 14th IFTToMM World Congress on (Taipei, Taiwan, Oct. 25–30, 2015), vol. 2, airti Library, 2015, pp. 117–123. DOI: 10.6567/IFTToMM.14TH.WC.OS4.020

Talks

P. T. Tempel, "Deforming slender soft bodies through discrete wrenches at their extremities," presented at the Dutch Soft Robotics Symposium 2023 (University of Twente, Enschede, Netherlands, May 16–17, 2023), 2023.

P. T. Tempel, "Hamiltonian integration, Integrating mechanical systems with symplectic and variational integrators," presented at the August-Meeting Working Group "Underactuated Mechanisms" (Nantes, France, Aug. 26, 2021), Aug. 26, 2021.

P. T. Tempel, "Isogeometric collocation analysis, Modeling of continuum robots using shape functions," presented at the January Meeting Working Group "Underactuated Mechanisms" (Nantes, France, Jan. 25, 2021), Jan. 25, 2021.

P. T. Tempel, "Solving IVPs, BVPs, Numerical integration, collocation, shape functions," presented at the January "ARMEN" Team Seminar (Nantes, France, Jan. 21, 2021), Jan. 21, 2021.

P. Tempel, "Cable-driven parallel robots, Handling precious items from humans to cultural heritage objects," presented at the NUACCESS/PIRE International Seminar Series on Cultural Heritage Research (Jul. 29, 2020), online, 2020.

P. Tempel, "The dynamics of cable-driven parallel robots with elastic and flexible, time-varying length cables," Stuttgart, Germany, 2018.

P. Tempel, "Improved modeling of cables for kinematics and dynamics of light-weight robots," Stuttgart, Germany, 2016.

P. Tempel, "Modeling dynamics of cables for use in cable-driven parallel robots," presented at the 2nd International Conference on Simulation Technology (Mar. 26–28, 2016), Stuttgart, Germany, Mar. 28, 2016.

Academic Services

Organization of Conferences, Workshops, etc.....

2023: Member local organizing committee *6th International Conference on Cable-Driven Parallel Robots, CableCon2023*, Nantes, France, Jun. 25–28, 2023

2020: Member local organizing committee *9th International Summer School on Screw-Theory Based Methods in Robotics*, Delft, Netherlands, Jul. 25–Aug. 2, 2020

Peer Reviewer.....

Journals:

- AsianJournal of Control AsJoCo;
- Elsevier Mechanism and Machine Theory MechMT, Mechatronics MECH, Robotics and Autonomous Systems ROBOT;
- Frontiers in Robotics and AI;
- IEEE Robotics and Automation Letters RA-L, Transactions on Robotics T-RO;
- IEEE/ASME Transactions on Mechatronics TMECH;
- Mechanics Based Design of Structures and Machines LMBD;
- MDPI Applied Sciences, Machines, Micromachines, Sensors, Symmetry;
- Springer Multibody System Dynamics MUBO;

Conferences:

- Advanced Intelligent Mechatronics *AIM*, IEEE/ASME International Conference on
- Advances in Robot Kinematics *ARK*, International Symposium on
- Cable-Driven Parallel Robots *CableCon*, International Conference on
- Computational Kinematics *CK*, IFToMM International Workshop on
- Intelligent Robots and Systems *IROS*, IEEE International Conference on
- Mechanism Science *EUCOMES*, European Conference on
- Robot Design, Dynamics and Control *ROMANSY*, CISM IFToMM Symposium on
- Robotics and Automation *ICRA*, IEEE International Conference on
- System Integration *SII*, IEEE/SICE International Symposium on

Memberships.....

Sep. 2023–present: IEEE Robotics and Automation Technical Committee on Soft Robotics

Mar. 2018–present: IEEE, IEEE Robotics and Automation Society (IEEE/RAS), IEEE Young Professionals

Jan. 2018–present: Wikimedia Germany e.V.

Work Experience

German Patent and Trade Mark Office

Munich, Germany

Patent Examiner

Apr. 2024–present

- Examination of patent applications for formal and substantive patentability requirements: novelty, inventive step, industrial applicability.;
- Execution of comprehensive prior art searches in national and international patent and literature databases.;
- Drafting of examination reports and legally binding decisions: granting of patents or rejection of applications.;
- Leading and conducting oral proceedings in examination procedures.;

Valeo Schalter und Sensoren GmbH

Bietigheim-Bissingen, Germany

Comfort & Driving Assistance Systems, Internship

Nov. 2011–Apr. 2012

System Simulation of Pedestrian Recognition Through Combination of UPA-Sensor and Camera Functionality

- Benchmarked software tools for simulation of camera-based ADAS;
- Simulated a car driving onto a curb using IPG CarMaker;
- Performed SiL and HiL simulation of lidar-based parking sensors;

Competencies

technical: mechatronic and robotic system design; robot modeling; real-time robot control; data analysis; design and perform experiments; research dissemination; project management; stakeholder management;

software: MATLAB; VCS (git, svn, hg); L^AT_EX; Python 3; Julia; TwinCAT; C/C++ 15; Docker; SolidWorks; functional programming; object-oriented programming; robot programming; CNC programming;

language: German (ILR Level 5); English (ILR Level 5); French (ILR Level 3); Dutch (ILR Level 2);

References

Sébastien Briot: CNRS researcher, CNRS Section 7, Laboratory of Digital Sciences of Nantes LS2N (CNRS UMR 6004), École Centrale de Nantes ECN: sebastien.briot@ls2n.fr

Just Herder: Professor, Department of Precision and Microsystems Engineering PME, Delft University of Technology: j.l.herder@tudelft.nl

Andreas Pott: Assistant professor and doctoral advisor, Institute for Control Engineering of Machine Tools and Manufacturing Units ISW, University of Stuttgart: andreas.pott@isw.uni-stuttgart.de

Marc Gouttefarde: CNRS Senior Researcher (DR2), CNRS Section 7, Team DEXTER, Robotics Department, Laboratory of Informatics, Robotics and Microelectronics of Montpellier (CNRS UMR 5506): marc.gouttefarde@lirmm.fr