

SHORT-CV FOR NOMINATED SUPERVISORY TEAM MEMBERS

GUIDANCE

- The RDCV form is used to support applications to the FRDC that affect supervisory arrangements (RD1 and RD5)
- This short-CV is required for the nomination of supervisory team members in the following circumstances only:
 - Proposed role holder has no completions within the past 10 years
 - Proposed role holder is a member of staff within a faculty other than that of the postgraduate researcher's registration
 - Proposed role holder is external to UWE Bristol
- This form should be **attached** to a completed RD1 or RD5 and submitted to the Graduate School Office (graduateschool@uwe.ac.uk)

SECTION 1: POSTGRADUATE RESEARCHER DETAILS *(for the application which this RDCV will support)*

Name of postgraduate researcher Ahtisham Lone	Faculty <input type="checkbox"/> ACE <input type="checkbox"/> FBL <input type="checkbox"/> FET <input type="checkbox"/> HAS
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SECTION 2: DETAILS OF PROPOSED SUPERVISORY TEAM MEMBER

Name (including title) Prof. Dr.-Ing. Paolo Mercorelli	Place of work (if internal please specify Faculty and Department) Leuphana University of Lueneburg
Post Held Universtitaetsallee 1, C12.35 D-21335, Lueneburg (Germany)	E-mail address (if external to UWE Bristol) mercorelli@uni.leuphana.de
Correspondence address (if external to UWE Bristol) Please include a telephone number including area code +49.4131.677-1896	

SECTION 3: ACADEMIC QUALIFICATIONS

Name of Institution	Degree Title (e.g., MA)	Degree Name/Main Subjects	Date of Award	Class/GPA (e.g. 2:1, 4.3/5)
Leuphana Universität Lueneburg	Full Professor	Control and Drive Systems	01.03.2012	
Ostfalia University of Applied Science	Associate Professor	Process Informatics	01.03.2005	
ABB Research Center (Heidelberg-Germany)	PostDoc	Research in the area of Control Systems and Signal Processing	31.07.2000	
University of Bologna (Italy)	Dr.	Research in the area of Robotic Manipulation	16.04.1998	

SECTION 4: SUPERVISION EXPERIENCE

Please note your supervision experience below *(in the last 10 years)*

MPHil				MPHil			
PhD				PhD			
Prof Doc				Prof Doc			
DPhil				DPhil			
Successfully Completed				Currently Supervising			
as DoS	21	4	3	as DoS	3	5	0
as 2 nd Sup	34	5	0	as 2 nd Sup	3	0	3
Has the role holder attended the UWE Bristol Supervisor development session?						<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

SECTION 5: RESEARCH INTERESTS AND EXPERTISE

Please provide a brief statement of your current research/knowledge exchange interests and expertise with particular reference to the postgraduate researcher's field of research

The current research focuses on the field of Control Systems, Signal Processing and applied Mathematics in particular in the field of Applied Algorithms. The current main topics of research are: Kalman Filters, Lyapunov Control Approach, Model Predictive Control, Sliding Mode Control, Wavelets Packets, Fractional Calculus and Geometric Control. These tools are applied in different industrial and academic projects.

Projecta at Leuphana

-Since November 2020 I have been supervising Dr. Benedikt Haus who is a PostDoc student working on the project OptiRob concerning the control of a robot for new manufacturing with the help of laser measurements integrating Kalman Filters which is financed by European Commission.

- Since November 2020 I have been supervising Mr. Lennart Schäfer as a candidate PhD student working on the project related to drones control.

-Since December 2020 I have been supervising Dr. Manuel Schimmack who is a PostDoc student working on the topic identification of load in an industrial electrical power line with the help of Neural Networks in combination with wavelets. (Leuphana Project).

-Since 1st January 2021 I have been supervising Dr. René Sallier of the University of Applied Sciences for Technik, Economics and Culture of Leipzig on the project RWTec-Match. In particular, implementation of Kalman Filter to be applied in a radio frequency based desiccator. Dr. René Sallier is doing his Habilitation under my supervision here in Leuphana University.

-Starting during the last days, I'm supervising the PhD student Mr. Tareq Abuaisha on the topic "A new method for modelling electrical energy converters using fractional calculus. He will start officially with the PhD program, presumably, in March 2021.

Industrial Projects:

- Mr. Philipp Hüger is starting as a PhD student working on the topic Model Predictive Control for a steering system for vehicular application in collaboration with Volkswagen Research Center in Wolfsburg (Germany)
- Mr. Timo Iken is starting as a PhD student working on the topic Sliding Mode Control for hybrid vehicles using asynchronous motors in collaboration with Volkswagen Research Center in Wolfsburg (Germany)
- Ms. Tanja Zwerger, since 2017, has been working on the topic control and a synchronous motor for application in hybrid trains by means of sliding mode control reducing sensors with the help of Kalman Filters. The project is supported by Rolls-Royce, Friedrichshafen (Germany).

Current exchanges

Current exchanges are established with the University of Lodz (Poland) which are active in the context of a Visiting Professorship exchanges in the field of Sliding Mode Control. Through Erasmus exchanges two other collaborations are active. The first one is established with Miskolc University which deals with an application of Kalman Filter in an accelerometer system. I'm co-supervisor of Dr. Ahmed Bouzid who is working as a PostDoc on the topic "Application of the accelerometer with help of Kalman Filter in mechanical applications". The second one is active with the University of Bologna which deals with the Geometric Approach being applied to control a Permanent Magnet Machine. The third one is an Erasmus Project with Craiova University in which I'm lecturer at the PhD school holding a course on Kalman Filters once per year. The program started in January 2020.

Through a Visiting Scientist Fellow at the Academy of Science of Prague, Bernstein Polynomials are considered to control the dynamics of robot manipulators in the field of manufacturing. On this topic I'm supervising the Master Student Roman Daniel Stefan of the Leuphana University of Lüneburg.

SECTION 6: RELEVANT PUBLICATIONS

Please list any relevant publications within the last 10 years (do not attach a full CV)

2021

1. Yuxin Su, Chunhong Zheng, **Paolo Mercorelli**, "Velocity-free friction compensation for motion systems with actuator constraint, *Mechanical Systems and Signal Processing*", Volume 148, 2021.

2020

1. **Mercorelli P.** et al., "Influence of data clouds fusion from 3D real-time vision system on robotic group dead reckoning in unknown terrain", *IEEE/CAA Journal of Automatica Sinica*, vol. 7, no. 2, pp. 368-385, 2020.
2. Benz K., Rech C., **Mercorelli P.** and Sergiyenko O., "Two Cascaded and Extended Kalman Filters and Sliding Mode Control for Sustainable Management of Marine Fish Stocks", *Journal of Automation, Mobile Robotics & Intelligent Systems (Jamris)*, (Publisher: Industrial Research Institute for Automation and Measurements PIAP), , vol. 14, no 3, pp. 28-35, 2020.
3. Haus B. and **Mercorelli P.**, "Polynomial Augmented Extended Kalman Filter to Estimate the State of Charge of Lithium-Ion Batteries", *IEEE Trans. on Veh. Technol.* vol. 7, no. 2, pp. 1452-1463, 2020.
4. Mironova A., Haus B., Zedler A. and **Mercorelli P.** "Extended Kalman Filter for Temperature Estimation and Control of Peltier Cells in a Novel Industrial Milling Process", *IEEE Trans. on Ind. Appl.*, vol. 56, no.2, pp. 1670-1678, 2020.
5. Su. Y., Zheng C. and **Mercorelli P.**, "Comments on "Modular-Controller-Design-Based Fast Terminal Sliding Mode for Articulated Exoskeleton Systems"", *IEEE Trans. on Control Syst. Technol.*, vol. 64, no.10, pp. 8187-8189, 2020.
6. Zheng C., Su Y. and **Mercorelli P.**, "Robust approximate fixed-time tracking control for uncertain robot manipulators", *Mechanical Systems and Signal Processing* (Elsevier publishing), vol. 135, 2020.

2019

1. Schimmack M. and **Mercorelli P.**, "A Structural Property of the Wavelet Packet Transform Method to Localise Incoherency of a Signal", *Journal of the Franklin Institute*, vol. 356, no. 16, pp. 10123-10137, 2019.
2. Schimmack M. and **Mercorelli P.**, "An adaptive derivative estimator for fault-detection Using a dynamic system with a suboptimal parameter", *Algorithms*, vol. 12, no. 5, 101, 2019.
3. Zheng C., Su Y. and **Mercorelli P.**, "Simple saturated relay nonlinear PD control for uncertain motion systems with friction and actuator constraint", *IET Control Theory & Applications*, vol. 13, no. 12, pp. 1920-1928, 2019.
4. Zheng, C., Su, Y., **Mercorelli P.**, "Faster Positioning of One Degree-of-Freedom Mechanical Systems with Friction and Actuator Saturation", *Journal of Dynamic Systems, Measurement and Control*, *Trans. of the ASME*, vol. 141, no. 6, 2019.
5. Zheng C., Su Y. and **Mercorelli P.**, "A simple nonlinear PD control for faster and high-precision positioning of servomechanisms with actuator saturation", *Mechanical Systems and Signal Processing* (Elsevier publishing), vol. 121, pp. 215-226, 2019.

2018

1. Fuhrhop C., **Mercorelli P.** and Quevedo D., "Q-Adaptive Control of the Nonlinear Dynamics in the Cantilever-sample System of an Atomic Force microscopy", *IEEE Latin American Transactions*, vol. 17, no. 9, 2400-2408, 2018.
2. Zheng C., Su Y. and **Mercorelli P.**, "Simple relay non-linear PD control for faster and high-precision motion systems with friction", *IET Control Theory & Applications*, vol. 12, no. 17, pp. 2302-2308, 2018.
3. Schimmack M., Haus B. and **Mercorelli P.**, "An Extended Kalman Filter as an Observer in a Control Structure for Health Monitoring of a Metal-Polymer Hybrid Soft Actuator", *IEEE/ASME Trans. on Mechatronics*, vol. 33, no. 3, pp. 1477-1487, 2018.
4. Mironova A., **Mercorelli P.** and Zedler A., "Thermal Disturbances Attenuation using a Lyapunov Controller for Ice-Clamping Device Actuated by Thermoelectric Coolers", *Thermal Science and Engineering Progress* (Elsevier Publishers), vol. 6, pp. 290-299, 2018.
5. Mironova A., **Mercorelli P.** and Zedler A., "Lyapunov Control Strategy for Thermoelectric Cooler Activating an Ice-Clamping System", *Journal of Thermal Science and Engineering Applications* (ASME), vol. 10, no. 4 , 2018.
6. Mironova A., **Mercorelli P.** and Zedler A., "A Multi Input Sliding Mode Control for Peltier Cells using a Cold-Warm Sliding Surface", *Journal of Franklin Institute* (Elsevier Publishers), vol. 355, no. 18, pp. 9351-9373, 2018.
7. Schimmack M. and **Mercorelli P.**, "A Wavelet Packet Tree Denoising Algorithm for Images of Atomic-Force Microscopy", *Asian J. Control* (Wiley & Sons publishing), vol. 20, no. 4, pp. 1367-1378, 2018.

8. Schimmack M. and **Mercorelli, P.**, “An on-line orthogonal wavelet denoising algorithm for high-resolution surface scans“, *Journal of Franklin Institute* (Elsevier Publishing), vol. 355, no. 18, pp. 9245-9270, 2018.
9. Haus B., Aschemann H. and **Mercorelli, P.**, “Tracking Control of a Piezo-Hydraulic Actuator Using Input-Output Linearization and a Cascaded Extended Kalman Filter Structure“, *Journal of Franklin Institute* (Elsevier Publishing), vol. 355, no. 18, pp. 9298-9320, 2018.

2017

1. **Mercorelli, P.**, “A motion sensorless control for intake valves in combustion engines“, *IEEE Trans. on Ind. Electron.*, vol. 64, no. 4, pp. 3402–3412, 2017.
2. **Mercorelli, P.** and Werner, N., “An adaptive resonance regulator design for motion control of intake valves in camless engine systems“, *IEEE Trans. on Ind. Electron.*, vol. 64, no. 4, pp. 3413–3422, 2017.
3. **Mercorelli, P.** et al., “Improve a 3D distance measurement accuracy in stereo vision systems using optimization methods’ approach“, *Opto-Electronics Review* (Elsevier Publishing), 25, no. 1, pp. 24–32, May 2017.
4. Su Y., Zheng C. and **Mercorelli P.**, “Global Finite-Time Stabilization of Planar Linear Systems with Actuator Saturation“, TCAS-II-00858-2016, *IEEE Trans. on Circuits and Systems II*, 264, no. 8, pp. 947-951, 2017.
5. Su Y., Zheng C. and **Mercorelli P.**, “Nonlinear PD Fault-Tolerant Control for Dynamic Positioning of Ships with Actuator Constraints“, *IEEE/ASME Trans. on Mechatronics*, vol. 22, no. 3, pp. 1132-1142, 2017.
6. Su Y., Zheng C. and **Mercorelli P.**, “Comments on “Tracking Control of Robotic Manipulators with Uncertain Kinematics and Dynamics“, *IEEE Trans. on Ind. Electron.*, vol. 64, no. 10, pp. 8187-8189, 2017.
7. **Schimmack M.** and **Mercorelli P.**, “Sliding mode Control using an extended Kalman filter as an observer for stimulus-responsive polymer fibres as actuator“, *International Journal of Modelling, Identification and Control*, Inderscience Publishing, vol. 27, no. 2, pp. 84-91, 2017.

2016

1. **Mercorelli, P.**, “Robust adaptive soft landing control of an electromagnetic valve actuator for camless engines“, *Asian J. Control* (Wiley & Sons publishing), vol. 18, no. 4, pp. 1299–1312, 2016.
2. **Mercorelli, P.** and Werner N., “Integrating a piezoelectric actuator with mechanical and hydraulic devices to control camless engines“, *Mechanical Systems and Signal Processing* (Elsevier publishing), vol. 78, pp. 55-70, 2016.
3. **Mercorelli P.** and Nils Werner, “A servo piezo mechanical hydraulic actuator and its control for camless internal combustion engines“, *International Journal of Modelling, Identification and Control*, Inderscience Publishing, vol. 25, no. 3, pp. 227-238, 2016.
4. **Schimmack M.** and **Mercorelli P.**, “Noise Detection for Biosignals Using an Orthogonal Wavelet Packet Tree Denoising Algorithm“, *Jet, Intl. Journal of Electronics and Telecommunications*, (De Gruyter Publishing), vol. 62, no. 1, pp. 15-21, 2016.
5. **Schimmack M.** and **Mercorelli P.**, “Scaling-based least squares method with implemented Kalman filter Approach for nano-parameters identification“, *International Journal of Modelling, Identification and Control*, Inderscience Publishing, vol. 25, no. 2, pp. 85-92, 2016.

From 2013 until 2015

1. **Mercorelli, P.**, “A two-stage sliding-mode high-gain observer to reduce uncertainties and disturbances effects for sensorless control in automotive applications“, *IEEE Trans. on Ind. Electron.*, vol. 62, no. 9, pp. 5929–5940, 2015.
2. **Mercorelli, P.**, “An adaptive and optimized switching observer for sensorless control of an electromagnetic valve actuator in camless internal combustion engines“, *Asian J. Control* (Wiley & Sons publishing), vol. 16, no. 4, pp. 959–973, 2014.
3. **Mercorelli, P.** et al., “Optimization of 3D laser scanning speed by use of combined variable step“, *Optical and Laser in Engineering* (Elsevier publishing), vol. 54, pp. 141-151, 2014.
4. **Mercorelli P.** et al., “Optical 3D laser measurement system for navigation of autonomous mobile robot“, *Optical and Laser in Engineering* (Elsevier publishing), vol. 54, pp. 159-169, 2014.
5. **Mercorelli P.**, “A denoising procedure using wavelet packets for instantaneous detection of pantograph oscillations“, *Mechanical Systems and Signal Processing* (Elsevier publishing), vol. 35, no. 1-2, pp. 137-149, February 2013.
6. **Mercorelli P.** and Nils Werner, “A hybrid actuator modelling and hysteresis effect identification in camless internal combustion engines control“, *International Journal of Modelling, Identification and Control*, Inderscience Publishing, vol. 21, no. 3, pp. 253-263, 2014.
7. **Mercorelli P.**, “Parameter identification in a permanent magnet three-phasesynchronous motor of a city bus for an intelligent drive assistant“, *International Journal of Modelling, Identification and Control*, Inderscience

Publishing, vol. 21, no. 4, pp. 352-361, 2014.

2012

1. **Mercorelli, P.**, “An antisaturating adaptive preaction and a slide surface to achieve soft landing control for electromagnetic actuators”, *IEEE/ASME Trans. on Mechatronics*, vol. 17, no. 1, pp. 76–85, 2012.
2. **Mercorelli, P.**, “A two-stage augmented extended Kalman filter as an observer for sensorless valve control in camless internal combustion engines”, *IEEE Trans. on Ind. Electron.*, vol. 59, no. 11, pp. 4236–4247, 2012.
3. **Mercorelli, P.**, “A hysteresis hybrid extended kalman filter as an observer for sensorless valve control in camless internal combustion engines”, *IEEE Trans. on Ind. Appl.*, vol. 48, no. 6, pp. 1940–1949, 2012.
4. Fabbrini, A., Garulli, A. and **Mercorelli, P.**, “A trajectory generation algorithm for optimal consumption in electromagnetic actuators”, *IEEE Trans. on Control Syst. Technol.*, vol. 20, no. 4, pp. 1025–1032, 2012.
5. **Mercorelli, P.**, “A geometric algorithm for the output functional controllability in general manipulation systems and mechanisms”, *Kybernetika* (International journal published by Institute of Information Theory and Automation of the Academy of Science of Prague), vol. 48, no. 6, pp. 1266-1288, 2012.
6. **Mercorelli, P.**, “Invariant subspaces for grasping internal forces and non-interacting force-motion control in robotic manipulation”, *Kybernetika* (International journal published by Institute of Information Theory and Automation of the Academy of Science of Prague), vol. 48, no. 6, pp. 1229-1249, 2012.

PLEASE RETURN THIS FORM TO THE GRADUATE SCHOOL OFFICE