

List of publications

Prof. Dr.-Ing. Michael Botsch

Publications

- G. Dietl, M. Botsch, F.A. Dietrich and W. Utschick. Robust and reduced-rank matrix Wiener filter based on the conjugate gradient algorithm. In *IEEE Workshop on Signal Processing Advances in Wireless Communications*, New York, June 2005.
- M. Botsch, G. Dietl and W. Utschick. Iterative Multi-User Detection Using Reduced-Complexity Equalization. In *ITG-Conference on Source and Channel Coding*, München, April 2006.
- M. Botsch. Feature Selection and Ensemble Learning in Time-Series Classification Tasks. Technical Report TUM-LNS-TR-07-01, Technische Universität München, 2006.
- M. Botsch and J. A. Nossek. Feature Selection for Change Detection in Multivariate Time-Series. In *IEEE Symposium on Computational Intelligence and Data Mining*, Honolulu, HI, April 2007.
- M. Botsch and J. A. Nossek. Construction of interpretable Radial Basis Function classifiers based on the Random Forest kernel. In *IEEE International Joint Conference on Neural Networks*, Hong-Kong, June 2008.
- P. Bergmiller, M. Botsch, J. Speth, and U. Hofmann. Vehicle rear detection in images with generalized radial-basis-function classifiers. In *IEEE Symposium Intelligent Vehicles*, Eindhoven, June 2008.
- M. Botsch. Machine Learning Techniques for Time Series Classification. Cuvillier, 2009.
- M. Reichel, M. Botsch, R. Rauschecker, K. Siedersberger and M. Maurer. Situation aspect modelling and classification using the scenario based random forest algorithm for convoy merging situations. In *IEEE International Conference on Intelligent Transportation Systems*, Funchal, September 2010.
- M. Botsch and C. Lauer. Complexity reduction using the Random Forest classifier in a collision detection algorithm. In *IEEE Intelligent Vehicles Symposium*, San Diego, CA, June 2010.
- T. Dirndorfer, M. Botsch, and A. Knoll. Model-based analysis of sensor-noise in predictive passive safety algorithms. In *Enhanced Safety of Vehicles Conference*, Washington, DC, June 2011.
- M. Botsch and J. Stoll. Analysis of the aperture angle of exteroceptive sensors for automotive safety applications in traffic-scenarios with crossing objects. *European Congress on Computational Methods in Applied Sciences and Engineering*, Vienna, September 2012.

- G. Notomista and M. Botsch. Maneuver Segmentation for Autonomous Parking Based on Ensemble Learning. In *International Joint Conference on Neural Networks*, Killarney, July 2015.
- S. Herrmann, W. Utschick, M. Botsch, and F. Keck. Supervised learning via optimal control labeling for criticality classification in vehicle active safety. In *IEEE International Conference on Intelligent Transportation Systems*, Gran Canaria, September 2015.
- G. Notomista, M. Selvaggio, F. Sbrizzi, G. Di Maio, S. Grazioso, and M. Botsch. A fast airplane boarding strategy using online seat assignment based on passenger classification. *Journal of Air Transport Management*, 53:140-149, 2016.
- A. Chaulwar, M. Botsch, T. Krueger, and T. Miehling. Planning of safe trajectories in dynamic multi-object traffic-scenarios. *Journal of Traffic and Logistics Engineering*, 4(2), 2016.
- P. Nadarajan, and M. Botsch. Probability Estimation for Predicted-Occupancy Grids in Vehicle Safety Applications Based on Machine Learning. In *IEEE Intelligent Vehicles Symposium*, Gothenburg, Sweden, June 2016.
- G. Notomista, A. Kammenhuber, P. Nadarajan, M. Botsch, and M. Selvaggio. Relative Motion Estimation Based on Sensor Eigenfusion Using a Stereoscopic Vision System and Adaptive Statistical Filtering. In *International Symposium on Robotics*, Munich, Germany, June 2016.
- M. Müller, P. Nadarajan, M. Botsch, W. Utschick, D. Böhmländer, and S. Katzenbogen. A Statistical Learning Approach for Estimating the Reliability of Crash Severity Predictions. In *IEEE Intelligent Transportation Systems Society Conference*, Rio de Janeiro, Brazil, November 2016.
- A. Chaulwar, M. Botsch and W. Utschick. A Hybrid Machine Learning Approach for Planning Safe Trajectories in Complex Traffic-Scenarios. In *IEEE International Conference on Machine Learning and Applications*, Anaheim, USA, December 2016.
- P. Nadarajan, M. Botsch and S. Sardina. Predicted-Occupancy Grids for Vehicle Safety Applications based on Autotencoders and the Random Forest Algorithm. In *International Joint Conference on Neural Networks*, Anchorage, Alaska, USA, May 2017.
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- G. Notomista and M. Botsch. A Machine Learning Approach for the Segmentation of Driving Maneuvers and its Application in Autonomous Parking. *Journal of Artificial Intelligence and Soft Computing Research*, 7(4):243-255, 2017.
- M. Müller, M. Botsch, D. Böhmländer, and W. Utschick. A Simulation Framework for Ve-

hicle Safety Testing. *Aktive Sicherheit und Automatisiertes Fahren*, pages 135–155, 2017. ISBN: 978-3816934059

- M. Müller, M. Botsch, D. Böhmländer, and W. Utschick. Machine Learning Based Prediction of Crash Severity Distributions for Mitigation Strategies. *Journal of Advances in Information Technology*, 2018.
- P. Nadarajan, M. Botsch, and S. Sardina. Machine Learning Architectures for the Estimation of Predicted Occupancy Grids in Road Traffic. *Journal of Advances in Information Technology*, 2018.
- V. Canas, E. Sanchez, M. Botsch, and A. Garcia. Wireless Communication System for the Validation of Autonomous Driving Functions on Full-Scale Vehicles. In *IEEE International Conference on Vehicular Electronics and Safety*, Madrid, Spain, September 2018.
- A. Chaulwar, M. Botsch, and W. Utschick. Generation of Reference Trajectories for Safe Trajectory Planning. In *International Conference on Artificial Neural Networks*, Rhodes, Greece, October 2018.
- O. Gallitz, O. De Candido, M. Botsch, and W. Utschick. Validation of Machine Learning Algorithms through Visualization Methods. In *VDI Electronics in Vehicles (ELIV) Market-Place*, Baden-Baden, Germany, October 2018.
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- E. Sanchez Morales, R. Membarth, A. Gaull, P. Slusallek, T. Dirndorfer, A. Kammenhuber, C. Lauer, and M. Botsch. Parallel Multi-Hypothesis Algorithm for Criticality Estimation in Traffic and Collision Avoidance. In *IEEE Intelligent Vehicles Symposium*, Paris, June 2019.
- E. Sanchez, M. Botsch, and B. Huber. High precision indoor positioning by means of LiDAR. In *DGON Inertial Sensors and Systems (ISS) Symposium Gyro Technology*, Braun-

schweig, Germany, September 2019.

- A. Chaulwar, M. Botsch, and W. Utschick. Efficient Hybrid Machine Learning Algorithm for Trajectory Planning in Critical Traffic-Scenarios. In *International Conference on Intelligent Transportation Engineering*, Singapore, September 2019.
- E. Sanchez, M. Botsch, B. Huber, and A. Garcia Higuera. High Precision Indoor Navigation for Autonomous Vehicles. In *International Conference on Indoor Positioning and Indoor Navigation*, Pisa, Italy, October 2019.
- O. Gallitz, O. d. Candido, M. Botsch, and W. Utschick. Interpretable Feature Generation using Deep Neural Networks and its Application to Lane Change Detection. In *IEEE International Conference on Intelligent Transportation Systems*, Auckland, New Zealand, October 2019.
- M. Botsch und W. Utschick. *Fahrzeugsicherheit und automatisiertes Fahren: Methoden der Signalverarbeitung und des maschinellen Lernens*. Carl Hanser Verlag. June 2020. <https://www.hanser-fachbuch.de/buch/Fahrzeugsicherheit+und+automatisiertes+Fahren/9783446453265>.
- O. d. Candido, M. Koller, O. Gallitz, R. Melz, M. Botsch and W. Utschick. Towards Feature Validation in Time to Lane Change Classification using Deep Neural Networks. In *IEEE International Conference on Intelligent Transportation Systems*, Virtual Conference, September 2020.
- E. Sanchez, F. Kruber, M. Botsch, B. Huber, and A. Garcia Higuera. Accuracy Characterization of the Vehicle State Estimation from Aerial Imagery. In *IEEE Intelligent Vehicles Symposium*, Las Vegas, USA, October 2020.
- F. Kruber, E. Sanchez, S. Chakraborty, and M. Botsch. Vehicle Position Estimation with Aerial Imagery from Unmanned Aerial Vehicles. In *IEEE Intelligent Vehicles Symposium*, Las Vegas, USA, October 2020.
- J. Wurst, A. Flores Fernandez, M. Botsch, and W. Utschick. An Entropy Based Outlier Score and its Application to Novelty Detection for Road Infrastructure Images. In *IEEE Intelligent Vehicles Symposium*, Las Vegas, USA, October 2020.
- A. Chaulwar, H. Al-Hashimi, M. Botsch, and W. Utschick. Sampling Algorithms Combination with Machine Learning for Efficient Safe Trajectory Planning. *International Journal of Machine Learning and Computing*, 2020. Accepted for publication.
- O. Gallitz, O. d. Candido, M. Botsch, R. Melz, and W. Utschick. Interpretable Machine Learning Structure for an Early Prediction of Lane Changes. In *International Conference on Artificial Neural Networks*, September 2020.

Patents (DEPATIS)

- Kollisions- und/oder Personenschutzsystem für ein Kraftfahrzeug, Publication No. DE102006044085B4, EP000002161163B1.
- Verfahren zur Ansteuerung einer Bremsvorrichtung eines Kraftfahrzeugs, Publication No. DE102010021872A1.
- Verfahren zur Auswertung von insbesondere wenigstens teilweise gemessenen, wenigstens einen Testdatensatz umfassenden Testdaten eines vorausschauenden Sicherheitssystems eines Kraftfahrzeugs zur Bewertung des vorausschauenden Sicherheitssystems, Publication No. DE102009029955A1.
- Verfahren zur Emulation eines Umgebungssensors in einem Kraftfahrzeug und zum Testen eines vorausschauenden Sicherheitssystems sowie Emulationsvorrichtung, Publication No. DE102011012961B3, EP000002495543B1, US000009159234B2, CN000102654753A.
- Fahrerassistenzsystem für ein Fahrzeug und Verfahren zum Vermeiden einer Kollision eines Fahrzeugs mit einem Objekt, Publication No. DE102011013486A1.
- Verfahren zum Steuern eines reversiblen Gurtstraffers eines Sicherheitsgurts in einem Kraftfahrzeug, Publication No. DE102011106247B4, EP000002726329B1, US000009150194B2, WO002013004342A1, CN000103635362A.
- Verfahren zum präventiven Schutz von Insassen eines Fahrzeugs vor einer Kollision, Publication No. DE102012005867B4.
- Verfahren zur Zuordnung eines Senders zu einem detektierten Objekt in der Kraftfahrzeug-zu-Kraftfahrzeug-Kommunikation und Kraftfahrzeug, Publication No. DE102012020297B4, EP000002722833A1, US020140104077A1, CN000103778796A.
- Verfahren zur Ermittlung eines eine Kollision betreffenden Prognoseergebnisses, Publication No. DE102016218549B3.