Integrated Components for Complexity Control in affordable electrified cars

Results

Project Information

3Ccar
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10.3030/662192

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€ 17 320 843,96

Coordinated by
INFINEON TECHNOLOGIES AG
Germany

Start date
1 June 2015

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31 October 2018

This project is featured in...

Charged up and ready to roll! Electric vehicles take to the road

NO. 77, NOVEMBER 2018
Deliverables

Documents, reports (5)

Final Plan for Use and Dissemination of the Foreground (PUDF) (T7.3)
This report outlines the objectives, approach and actions that the consortium will target early on in the project. The final PUDF will provide the paths to further exploitation of project results, after the project is finished. The plan contains current and future dissemination activities as well as the plans of future commercialization and exploitation possibilities.

Second report 3Ccar standardization and technology module platform (T7.6)
The second report of standardization and technology module platform will concentrate on the requirements and standards of the two-years project results, regarding the subsystems, system integration and system architectures for electric vehicles.

Third report 3Ccar standardization and technology module platform (T7.7)
The third report of standardization and technology module platform will concentrate on the requirements and standards of the overall project results, regarding the subsystems, system integration and system architectures for electric vehicles.

Engineering workshop (T7.2)
The report will outline the disseminational activities and workshops aiming to ensure the further exploitation of project results, thus reaching the wider audience of the target users.

First report 3Ccar standardization and technology module platform (T7.5)
The first report outlines the input to standardization organizations in which project partners are involved. The first report of standardization and technology module platform will concentrate on the requirements and standards of the first-year project results, regarding the subsystems, system integration and system architectures for electric vehicles.

Other (1)

Project website (T7.4)
3Ccar WEB portal established and operating; web portal will include a public part as well as a project internal part (document management system for archiving and...
Publications

Implementation and verification of the PMSM stator interturn short fault detection algorithm
Author(s): Lukas Otava, Ludek Buchta
Publisher: IEEE
DOI: 10.23919/EPE17ECCEEurope.2017.8099080

Adapting Unit Tests by Generating Combinatorial Test Data
Author(s): Hermann Felbinger, Franz Wotawa, and Mihai Nica
Publisher: IEEE

“A ""Strength of Decision Tree Equivalence""-Taxonomy and Its Impact on Test Suite Reduction.”
Author(s): Hermann Felbinger, Ingo Pill, and Franz Wotawa
Published in: Testing Software and Systems - 29th IFIP WG 6.1 International Conference, ICTSS 2017, 29th, 2017, Page(s) 15, ISBN 978-3-319-67548-0
Publisher: Springer

FPGA Master based on chip communications architecture for Cyclone V SoC running Linux
Author(s): R. Novickis, M. Greitān
Published in: 2018
Publisher: IEEE-2018 International Conference on Control, Decision and Information Technologies (CoDIT)

Performance of Adaptive Filters for Predicting the Future Values of the Vehicle Sideslip Angle
Comparison of soft-landing position control and energy minimization performance of two fluid-control solenoid valves

Author(s): J.R.M. van Dam, B.L.J. Gysen, M. Roes, E.A. Lomonova
Published in: EPE ’18 ECCE Europe: 20th European conference on power electronics and applications, 2018
Publisher: IEEE

**Soft-landing control of low-energy solenoid valve actuators**

Author(s): J. R. M. van Dam, B. L. J. Gysen, E. A. Lomonova, M. Dhaens
Publisher: IEEE
DOI: 10.1109/EVER.2018.8362372

Design, control, and comparison of low-energy solenoid valve actuators

Author(s): J.R.M. van Dam, B.L.J. Gysen, M. Dhaens, E.A. Lomonova
Published in: INTERMAG 2018 : IEEE 2018 International Magnetics Conference, 2018, Page(s) 1-5
Publisher: IEEE

Predictive Thermal Management Strategy for Fast Charging Electric Vehicles

Author(s): Bogdan Rosca, Steven Wilkins
Published in: EVS31, 2018
Publisher: The 31st International Electric Vehicle Symposium & Exhibition & International Electric Vehicle Technology Conference 2018

Directly Cooled HybridPACK Power Modules with Ribbon Bonded Cooling Structures

Author(s): Andre Uhlemann; Erwin Hymon
Published in: Proceedings of the PCIM Europe Conference 2018, 2018, Page(s) 17, ISBN 978-3-8007-4646-0
Publisher: VDE

Non-isolating DC/DC converter for a fuel cell powered aircraft

Author(s): Otto Kreutzer, Markus Billmann, Martin Maerz, Axel Lange
Published in: 2016 International Conference on Electrical Systems for Aircraft,
Test-Suite Reduction Does Not Necessarily Require Executing the Program under Test

Author(s): Hermann Felbinger, Franz Wotawa, Mihai Nica
Publisher: IEEE
DOI: 10.1109/QRS-C.2016.8

Integrated model for battery Electric Vehicles with energy harvesting active suspension system

Author(s): T.H. Pham, J. Jacob, S. Wilkins, C. Lauwerys, M. Dhaens
Publisher: IEEE
DOI: 10.1109/ever.2017.7935863

System on chip battery state estimator: E-bike case study

Author(s): Rocco Morello, Roberto Di Rienzo, Federico Baronti, Roberto Roncella, Roberto Saletti
Published in: IECON 2016 - 42nd Annual Conference of the IEEE Industrial Electronics Society, 2016, Page(s) 2129-2134, ISBN 978-1-5090-3474-1
Publisher: IEEE
DOI: 10.1109/IECON.2016.7794140

Empirical Study of Correlation between Mutation Score and Model Inference Based Test Suite Adequacy Assessment

Author(s): Felbinger Hermann; Wotawa Franz; Nica Mihai
Published in: 3, 2017
Publisher: ZENODO
DOI: 10.1109/AST.2016.015

Sensorless battery cell temperature estimation circuit for enhanced safety in battery systems

Author(s): R. Schwarz, K. Semmler, M. Wenger, V. R. H. Lorentz, M. Marz
Published in: IECON 2015 - 41st Annual Conference of the IEEE Industrial Electronics Society, 2015, Page(s) 001536-001541, ISBN 978-1-4799-1762-4
Publisher: IEEE
DOI: 10.1109/IECON.2015.7392319
Aviation battery monitoring electronics in lithium-ion based battery systems for electrified sailplanes and aircrafts

**Author(s):** R. Schwarz, R. Waller, M. Wenger, M. Akdere, J. Neureuther, M. Gepp, S. Koffel, V. R. H. Lorentz, M. Marz, A. Holtsmark, V. Gribov, A. Lange

**Published in:** 2016 International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles & International Transportation Electrification Conference (ESARS-ITEC), 2016, Page(s) 1-4, ISBN 978-1-5090-0814-8

**Publisher:** IEEE

**DOI:** 10.1109/ESARS-ITEC.2016.7841387

Mutation Score, Coverage, Model Inference: Quality Assessment for T-Way Combinatorial Test-Suites

**Author(s):** Hermann Felbinger, Franz Wotawa, Mihai Nica

**Published in:** 2017 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), 2017, Page(s) 171-180, ISBN 978-1-5090-6676-6

**Publisher:** IEEE

**DOI:** 10.1109/ICSTW.2017.36

Simulink generated control algorithm for nine-phase PMS motor

**Author(s):** Matus Kozovsky, Petr Blaha

**Published in:** 2017 7th IEEE International Conference on Control System, Computing and Engineering (ICCSCE), 2017, Page(s) 59-64, ISBN 978-1-5386-3897-2

**Publisher:** IEEE

**DOI:** 10.1109/ICCSCE.2017.8284380

Test Suite Reduction Does Not Necessarily Require Executing the Program under Test

**Author(s):** Hermann Felbinger, Ingo Pill, Franz Wotawa

**Published in:** 2016, Page(s) 76-93, ISBN 9783-319411347

**Publisher:** Springer International Publishing

**DOI:** 10.1007/978-3-319-41135-4_5


**Author(s):** Franz Wotawa

**Published in:** 2016 IEEE International Conference on Software Quality, Reliability and Security Companion (QRS-C), 2016, Page(s) 305-310, ISBN 978-1-5090-3713-1

**Publisher:** IEEE

**DOI:** 10.1109/QRS-C.2016.47

Electronic module for the thermal monitoring of a Li-ion battery cell through the electrochemical impedance estimation
Empirical Study of Correlation Between Mutation Score And Model Inference Based Test Suite Adequacy Assessment

Author(s): Marco Ranieri, Diego Alberto, Helene Piret, Viviane Cattin
Publisher: IEEE
DOI: 10.1109/THERMINIC.2016.7749069

Electronic Module for the Thermal Monitoring of a Li-ion Battery Cell through the Electrochemical Impedance Estimation

Author(s): Marco Ranieri, Diego Alberto, Hélène Piret, Viviane Cattin
Published in: 22nd International Workshop on Thermal Investigations of ICs and Systems (THERMINIC), September 2016, 2016
Publisher: IEEE

User dependent aging prediction model for automotive controllers with power electronics

Author(s): S. Malipatolla, A. Unutulmaz, D. Helms
Published in: 2017 27th International Symposium on Power and Timing Modeling, Optimization and Simulation (PATMOS), September 2017, 2017
Publisher: IEEE Xplore

An improved impedance-based temperature estimation method for Li-ion batteries

Author(s): Beelen, Raijmakers, Donkers, Notten, Bergveld
Published in: 4th IFAC Workshop on Engine and Powertrain Control, Simulation and Modeling E-COSM 2015 , August 2015, 2015, Page(s) 383-388
Publisher: Elsevier B.V.

Machine and Actuator Design: Modeling 3-D Fields and Forces using the Analytical Surface Charge Expressions

Author(s): van Dam, J.R.M., Paulides, J.J.H., Dhaens, M. & Lomonova, E.A.
Published in: International Conference On Sustainable Mobility Applications, Renewables and Technology (SMART2015), November 2015, 2015, Page(s) 1-5
Publisher: IEEE
Verification of nine-phase PMSM model in d-q coordinates with mutual couplings

**Author(s):** Matus Kozovsky, Petr Blaha, Pavel Vaclavek  
**Published in:** 2016 6th IEEE International Conference on Control System, Computing and Engineering (ICCSCE), 2016, Page(s) 73-78, ISBN 978-1-5090-1178-0  
**Publisher:** IEEE  
**DOI:** 10.1109/ICCSCE.2016.7893548

Reducing Power Consumption of an Active Suspension System using Improved Control and/or Energy Harvesting Module

**Author(s):** T. Pham, S. Wilkins, C. Lauwerys, M. Dhaens  
**Published in:** 26th Aachen Colloquium Automobile and Engine Technology 2017, 2017  
**Publisher:** RWTH Aachen University

Characterization of the spatial resolution capability a novel carbon fiber strain sensor based on characteristic impedance measurements impedance

**Author(s):** Robin Höhne, Pavel Kostka, Niels Modler  
**Published in:** AMA Conferences 2017, 2017  
**Publisher:** AMA Service GmbH

Crosstalk interferences on impedance measurements in battery packs

**Author(s):** Raijmakers, L.H.J., Mundaragi Shivakumar, K., Donkers, M.C.F., Lammers, M.J.G. & Bergveld, H.J.  
**Published in:** Proceedings of the IFAC International Symposium on Advances in Automotive Control (IFAC-PapersOnline), 2017, Page(s) pp. 42-47  
**Publisher:** Elsevier

Damper-to-Damper Path Loss Characterization for Intra-Vehicular Wireless Sensor Networks

**Author(s):** Carlos A. M. Costa Júnior, Hao Gao, Thibault Le Polain, Rainier van Dommele, Bart Smolders, Miguel Dheans, Peter Baltus  
**Published in:** 2017  
**Publisher:** to be clarified

A computationally efficient implementation of an electrochemistry-based model for Lithium-Ion batteries

**Author(s):** Xia, L., Najafi, E., Bergveld, H.J. & Donkers, M.C.F.  
**Published in:** Proceedings of the IFAC World Congress, 2017, ISSN 0306-2619  
**Publisher:** Elsevier
Joint state and parameter estimation for discrete-time polytopic linear parameter-varying systems

Author(s): Beelen, H.P.G.J. & Donkers, M.C.F.
Published in: Proceedings of the IFAC World Congress, 2017
Publisher: Elsevier

Cyclic testing of novel carbon fiber based strain sensor with spatial resolution

Author(s): Robin Höhne, Pavel Kostka and Niels Modler
Published in: 2016
Publisher: ECCM17 - 17th European Conference on Composite Materials

Peer reviewed articles (6)

3D Printed acceleration sensor: a case study
Author(s): G. Moagār-Poladian, C. Tibeicā, V. Moagār-Poladian
Published in: Romanian Journal of Information Science and Technology, Vol. 21 No. 1, 2018, Page(s) 61-81, ISSN 1453-8245
Publisher: Publishing House of the Romanian Academy

Intelligent Torque Vectoring Approach for Electric Vehicles with Per-Wheel Motors
Author(s): Alberto Parra, Asier Zubizarreta, Joshué Pérez, Martín Dendaluce
Published in: Complexity, 2018, 2018, Page(s) 1-14, ISSN 1076-2787
Publisher: John Wiley & Sons Inc.
DOI: 10.1155/2018/7030184

A computationally efficient implementation of a full and reduced-order electrochemistry-based model for Li-Ion batteries
Author(s): Xia, L.; Najafi, E.; Li, Z.; Bergveld, H.J.; Donkers, M.C.F.
Published in: Applied Energy, 2, 2017, Page(s) 208, ISSN 0306-2619
Publisher: Pergamon Press Ltd.

High Speed Operation Tests of Resolver Using AURIX Microcontroller Interface
Author(s): M. Kozovsky, P. Blaha
Published in: IFAC-PapersOnLine, 51/6, 2018, Page(s) 384-389, ISSN 2405-8963
Publisher: IFAC
DOI: 10.1016/j.ifacol.2018.07.184

E-transportation: the role of embedded systems in electric energy transfer from grid to vehicle
A comparison and accuracy analysis of impedance-based temperature estimation methods for Li-ion batteries

Author(s): Federico Baronti, Mo-Yuen Chow, Chengbin Ma, Habiballah Rahimi-Eichi, Roberto Saletti
Published in: EURASIP Journal on Embedded Systems, 2016/1, 2016, Page(s) 1-12, ISSN 1687-3963
Publisher: Springer Open
DOI: 10.1186/s13639-016-0032-z

Testing Autonomous and Highly Configurable Systems: Challenges and Feasible Solutions

Author(s): H.P.G.J. Beelen, L.H.J. Raijmakers, M.C.F. Donkers, P.H.L. Notten, H.J. Bergveld
Published in: Applied Energy, 175, 2016, Page(s) 128-140, ISSN 0306-2619
Publisher: Pergamon Press Ltd.
DOI: 10.1016/j.apenergy.2016.04.103

Book chapters (1)

Testing Autonomous and Highly Configurable Systems: Challenges and Feasible Solutions
Author(s): Franz Wotawa
Published in: Automated Driving - Safer and More Efficient Future Driving, 2017, Page(s) 519-532, ISBN 978-3-319-31893-6
Publisher: Springer International Publishing
DOI: 10.1007/978-3-319-31895-0_22

Other (28)

Damper-to-Damper Path Loss Characterization for Intra-Vehicular Wireless Sensor Networks
Author(s): C. A. M. Costa Júnior, H. Gao, T. Le Polain, R. van Dommele, B. Smolders, M. Dheans, P. Baltus
Published in: 2017
Publisher: -

Analytical surface charge method for rotated permanent magnets: boundary element method comparison and experimental validation
Author(s): van Dam, J.R.M., Paulides, J.J.H., Robertson, W.S.P., Dhaens, M. & Lomonova, E.A.
Published in: IEEE Transactions on Magnetics, January 2016, 2016, Page(s) 1-8
Publisher: IEEE
Modeling and control of ac electric drives during fault conditions
Author(s): M. Kozovsky, P. Blaha
Published in: 2017
Publisher: -

Inverse calculation of strain profiles from ETDR measurements using artificial neuronal networks
Author(s): H. Robin, K. Pawel, M. Niels
Published in: 2017
Publisher: -

Simulink generated control algorithm for nine-phase PMS motor
Author(s): M. Kozovsky, P. Blaha
Published in: 2017
Publisher: -

Tuning of Moving Window Least Squares-based Algorithm for Online Battery Parameter Estimation
Author(s): R. Morello, R. Di Rienzo, R. Roncella, R. Saletti and F. Baronti
Published in: 2016
Publisher: -

Benefits of new CoolSiC™ MOSFET in HybridPACK™ Drive package for electrical drive train applications
Published in: 2017
Publisher: -

Model-order reduction of a nonlinear Lithium-ion battery model using proper orthogonal decompositions and discrete empirical interpolations
Author(s): Li, Donkers, Danilov, Bergveld
Published in: IEEE CDC, 2016
Publisher: IEEE

Characterization and Mission Profile Analysis of a SiC Hybrid Module for Main Inverter Application of Electric Vehicle
Author(s): A. P. Pai, T. Reiter, M. Maerz
Published in: 2017
A Reconfigurable Receiver with 38 dB Frequency-Independent Blocker Suppression and Enhanced In-Band Linearity and Power Efficiency

**Author(s):** K. Ying, C. A. M. Costa Júnior, B. Wang, D. Milos  
**Published in:** 2017

Advances in Li-Ion Battery Management for Electric Vehicles

**Author(s):** R. Morello, R. Di Rienzo, R. Roncella, R. Saletti, R. Schwarz, V.R.H. Lorentz, E.R.G. Hoedemaekers, B. Rosca, F. Baronti  
**Published in:** 2016

Characterization of Damper-to-Damper Wireless Channel in Small Cars

**Author(s):** C. A. M. Costa Júnior, H. Gao, T. Le Polain, M. Dheans, P. Baltus  
**Published in:** 2017

Degradation mechanisms of C6/LiFePO4 batteries: experimental analysis of calendar aging

**Author(s):** Li, Danilov, Xie, Raijmakers, Gao, Yang, Notten  
**Published in:** Electrochimica Acta Volume 190, February 2016, 2016, Page(s) 2016  
**Publisher:** Elsevier B.V.

Electronic Module for the Thermal Monitoring of a Li-ion Battery Cell through the Electrochemical Impedance Estimation

**Author(s):** M. Ranieri, D. Alberto, H. Piret, V. Cattin  
**Published in:** 2016

E-transportation: the role of embedded systems in electric energy transfer from grid to vehicle

**Author(s):** F. Baronti, M.-Y. Chow, C. Ma, H. Rahimi-Eichi, and R. Saletti  
**Published in:** EURASIP Journal of Embedded Systems, May 2016, 2016, Page(s) 11-12  
**Publisher:** Springer Open
Testing Self-Adaptive Systems using Fault Injection and Combinatorial Testing

**Author(s):** F. Wotawa  
**Publisher:** IEEE

Intelligent Torque Vectoring approach for Electric Vehicles with per-wheel motors

**Author(s):** A. Parra, A. Zubizarreta, J. Perez, M. Dendaluce  
**Published in:** 2017  
**Publisher:** -

Sensorless Battery Cell Temperature Estimation Circuit for Enhanced Safety in Battery Systems

**Author(s):** Radu Schwarz  
**Published in:** Industrial Electronics Society, IECON 2015 - 41st Annual Conference of the IEEE, November 2015, 2015  
**Publisher:** IEEE

Mutation Score, Coverage, Model Inference: Quality Assessment for T-Way Combinatorial Test-Suites

**Author(s):** Felbinger, H.; Wotawa, F.; Nica, M.  
**Published in:** 2017  
**Publisher:** -

Classifying Test Suite Effectiveness via Model Inference and ROBBDs

**Author(s):** H. Felbinger, I. Pill, and F. Wotawa  
**Published in:** Volume 9762 of the series Lecture Notes in Computer Science, June 2016, 2016, Page(s) 76-93  
**Publisher:** Springer International Publishing

Integrated Model for Battery Electric Vehicles with Energy Harvesting Active Suspension System

**Author(s):** T.H. Pham, J. Jacob, S. Wilkins, C. Lauwerysy and M. Dhaens  
**Published in:** 2016  
**Publisher:** -

Flux linkage characterization-based technique for cross-coupling effects compensation dealing with IPMSM sensorless control

**Author(s):** W. Zine, E. Monmasson, L. Idkhajine, A. Bruyere, B. Condamin, P.A. Chauvenet, L. Kobylanski
Evaluation of comfort level and harvested energy in the vehicle using controlled damping

**Author(s):** V. Bucinskas, P. Mitrouchev, E. Sutinys, N. Sesok, I. Iljin, I. Morkvenaite-Vilkonciene

**Published in:** 2017
**Publisher:** -

Degradation mechanisms of C6/LiFePO4 batteries: experimental analysis of cycling-induced aging

**Author(s):** Li, Danilov, Gao, Yang, Notten

**Published in:** Electrochimica Acta Volume 210, August 2016, 2016
**Publisher:** Elsevier B.V.

Sensor “conversion” by 3D Printing- A case study

**Author(s):** G. Moagăr-Poladian, C. Tibeică, V. Moagăr-Poladian

**Published in:** 2016
**Publisher:** -

Path Loss Characterization for Intra-Vehicular Wireless Sensor Networks

**Author(s):** C. Costa Junior, T. Le Polain et al.

**Published in:** European Conference on Antennas and Propagation (EUCAP2017), March 2017, 2017
**Publisher:** IEEE

Performances analysis of saliency-based sensorless control in low speed region and standstill for automotive applications

**Author(s):** W. Zine, E. Monmasson, L. Idkhajine, A. Bruyere, B. Condamin, P.A. Chauvenet

**Published in:** 2016
**Publisher:** -

System on chip battery state estimator: E-bike case study

**Author(s):** Morello, R.; Di Rienzo, R.; Baronti, F.; Roncella, R.; Saletti, R.

**Published in:** 2016, 2016
**Publisher:** IEEE Computer Society