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MOBI - Electromobility research centre  
Electrical Engineering and Power Electronics  
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## Qualifications

PhD in Engineering Sciences and Technology (F.R.I.A. Grant)  
1 Oct 2012 → 20 Jan 2017  
Master in Electrical Engineering (Energy), Université libre de Bruxelles  
Sep 2010 → Jun 2012  
Bachelor in Electromechanical Engineering, Université libre de Bruxelles  
Sep 2007 → Jun 2010

## Employment

### **MOBI - Electromobility research centre**

Vrije Universiteit Brussel  
Brussels, Belgium  
4 May 2020 → present

### **postdoctoral researcher**

Electrical Engineering and Power Electronics  
Vrije Universiteit Brussel  
Brussels, Belgium  
8 Apr 2019 → 31 Dec 2025

### **Project Engineer**

GreenWatch  
Belgium  
17 Oct 2017 → 31 Dec 2018

### **Researcher**

University of Nottingham  
Nottingham, United Kingdom  
1 Aug 2015 → 30 Sep 2015

### **Trainee**

ESTEC  
Netherlands  
1 Aug 2011 → 28 Oct 2011

### **Researcher**

Instituto Superior Técnico  
Lissabon, Portugal  
1 Oct 2010 → 20 Jan 2017

## Research outputs

### **Lifetime and Cost Analysis of DC-DC Solid State Transformers for Wind Applications**

Ogan, S. E., Chakraborty, S., Geury, T. & Hegazy, O., 21 Jun 2024, *2024 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)*. IEEE, p. 611-618 8 p.

### **Accelerated Lifetime Model-Based Design Optimization Strategy With Efficiency, Reliability, and Cost Trade-Off for High-Power Modular AFE Rectifiers**

Zhaksylyk, A., Polat, H., Jaman, S., Geury, T. & Hegazy, O., 20 May 2024, In: *IEEE Access*. 12, p. 71286-71303 17 p.

### **Modeling and Control of a Modular Multilevel Converter Based on a Battery Energy Storage System with Soft Arm State-of-Charge Balancing Control**

Wang, Y., Chakraborty, S., Geury, T. & Hegazy, O., 4 Feb 2024, In: *Energies*. 17, 3, 24 p., 740.

### **Inductance and Power Losses Analysis of an Arm Inductor for a Modular Multilevel Converter**

Wang, Y., Chakraborty, S., Geury, T. & Hegazy, O., 30 Jan 2024, *2023 IEEE Vehicle Power and Propulsion Conference (VPPC)*. IEEE, 6 p. (2023 IEEE Vehicle Power and Propulsion Conference, VPPC 2023 - Proceedings).

### **A High-Level Optimal Charging Management Strategy Using Model Predictive Control for Megawatt Charging Station**

Dalir, A., Jaman, S., Geury, T. & Hegazy, O., 2024, p. 351-356. 6 p.

### **Development and Comparison of Rule- and Machine Learning-Based EMS for HESS Providing Grid Services**

Polat, H., Unamuno, E., Cabezuolo, D., Geury, T. & Hegazy, O., 2024, In: *IEEE Access*. 12, 10 p.

### **Architecture design for converter applications**

Ogan, S. E., Chakraborty, S., Geury, T. & Hegazy, O., 21 Dec 2023, *SiC4GRID Project Horizon 2020*. 46 p.

### **Development of Smart Charging Scheduling and Power Management Strategy of a PV-ESS based Scalable EV Charging Station**

Jaman, S., Verbrugge, B., Zhaksylyk, A., Geury, T., El Baghdadi, M. & Hegazy, O., 13 Dec 2023, In: *Transportation Research Procedia*. 72, 1, p. 1240-1247 8 p., TRPRO15962.

### **Assessing the Impact of EV Charging and Discharging Profiles on T-Type Active Front End Charger Lifetime**

Polat, H., Hosseinabadi, F., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., 16 Nov 2023, *IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society*. Singapore: IEEE, p. 1-7 7 p. (IECON Proceedings (Industrial Electronics Conference)).

### **Development and Validation of an Integrated EV Charging Station with Grid Interfacing Inverter for Residential Application**

Jaman, S., Abdel Monem, M., Geury, T. & Hegazy, O., 10 Oct 2023, In: *IEEE Access*. 11, 1, p. 115751-115774 24 p.

### **Modeling and Validation of Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G) Operation with Combo CCS Type 2 Connector for Medium Duty Electric Vehicle Applications**

Jaman, S., Hernandez Garcia, O., Abdel Monem, M., Geury, T. & Hegazy, O., 2 Oct 2023, *2023 25th European Conference on Power Electronics and Applications (EPE'23 ECCE Europe)*. Aalborg, Denmark: IEEE, p. 1-8 8 p. (2023 25th European Conference on Power Electronics and Applications, EPE 2023 ECCE Europe).

### **Simulation Analysis of the 5-Leg Inverter for a Fault-Tolerant Dual-Motor Drive System**

Al Sakka, M., Geury, T., El Baghdadi, M., Dhaens, M., Al Sakka, M. & Hegazy, O., 2 Oct 2023, *European Conference on Power Electronics and Applications*. IEEE, 10 p. (2023 25th European Conference on Power Electronics and Applications, EPE 2023 ECCE Europe).

### **30 kW Three-Phase T-Type Active Front End 3D Electro-thermal Design**

Polat, H., Egin Martin, G., Tran, M. T., Geury, T., El Baghdadi, M. & Hegazy, O., 4 Sep 2023, *2023 25th European Conference on Power Electronics and Applications (EPE'23 ECCE Europe)*. IEEE, 8 p. (2023 25th European Conference on Power Electronics and Applications, EPE 2023 ECCE Europe).

**Performance Assessment of a Grid-Connected Two-Stage Bidirectional Converter for a Combined PV–Battery Energy Storage System**

Hasan, M. M., Jaman, S., Geury, T. & Hegazy, O., 1 Jun 2023, In: *Energies*. 16, 11, p. 1-20 20 p., 4486.

**A Review on Multilevel Converters for Efficient Integration of Battery Systems in Stationary Applications**

Rauf, A. M., Geury, T. & Hegazy, O., May 2023, In: *Energies*. 16, 10, 38 p., 4133.

**Co-design Optimization Framework for Grid Reinforcing Hybrid Battery Energy Storage System**

Hasan, M. M., Geury, T. & Hegazy, O., 30 Mar 2023.

**Review of Active Front-End Rectifiers in EV DC Charging Applications**

Zhaksylyk, A., Rasool, H., Abramushkina, E., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., Mar 2023, In: *Open access journal Batteries- Special Issue on Advances in Charging Systems and Charging Management Strategies for Battery Electric Vehicles*. 9, 3, p. 1-35 36 p., 150.

**Power Electronics and Battery Cooling Methods**

Polat, H., Hosseinabadi, F., Hasan, M. M., Chakraborty, S., Geury, T., El Baghdadi, M., Wilkins, S. & Hegazy, O., 27 Feb 2023, *Batteries*.

**A Review of DC Fast Chargers with BESS for Electric Vehicles: Topology, Battery, Reliability Oriented Control and Cooling Perspectives**

Polat, H., Hosseinabadi, F., Hasan, M. M., Chakraborty, S., Geury, T., El Baghdadi, M., Wilkins, S. & Hegazy, O., 8 Feb 2023, In: *Open access journal Batteries- Special Issue on Advances in Charging Systems and Charging Management Strategies for Battery Electric Vehicles*. 9, 2, p. 1-36 36 p., 121.

**Development of Smart Charging Scheduling and Power Management Strategy of a PV-ESS based Scalable EV Charging Station**

Jaman, S., Verbrugge, B., Zhaksylyk, A., Geury, T., El Baghdadi, M. & Hegazy, O., 2023, In: *Transportation Research Procedia*. 72, p. 1240-1247 8 p.

**Design and Simulation of a Grid-Connected Two-Stage Bidirectional Converter for a Combined PV-Stationary Energy Storage System**

Hasan, M. M., Jaman, S., Geury, T. & Hegazy, O., 23 Dec 2022, *2022 Second International Conference on Sustainable Mobility Applications, Renewables and Technology (SMART)*. IEEE, p. 1-8 8 p. (2022 2nd International Conference on Sustainable Mobility Applications, Renewables and Technology, SMART 2022).

**Reliability Assessment of SiC-Based Depot Charging Infrastructure with Smart and Bidirectional (V2X) Charging Strategies for Electric Buses**

Verbrugge, B., Rasool, H., Hasan, M. M., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., 23 Dec 2022, In: *Energies*. 16, 1, p. 1-15 15 p., 153.

**Active Thermal Control of a WBG-based AC-DC Converter Using Dynamic Gate-drive for Lifetime Improvement**

Hosseinabadi, F., Polat, H., Egin Martin, G., Bhoi, S. K., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., 9 Dec 2022, *IECON 2022 – 48th Annual Conference of the IEEE Industrial Electronics Society*. IEEE, 6 p. (IECON Proceedings (Industrial Electronics Conference); vol. 2022-October).

**Comparative Performance Assessment of Predictive Torque Control Strategy for Motor Drive Applications**

Jaman, S., Zhaksylyk, A., Chakraborty, S., Tran, D-D., El Baghdadi, M., Geury, T. & Hegazy, O., 9 Dec 2022, *48th Annual Conference of the IEEE Industrial Electronics Society*. IEEE Xplore, p. 1-6 6 p. (IECON Proceedings (Industrial Electronics Conference); vol. 2022-October).

**Effects of modularity on the performance and reliability of SiC MOSFET-based active front-end rectifiers in EV charging application**

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### **Development and Validation of V2G Technology for Electric Vehicle Chargers Using Combo CCS Type 2 Connector Standards**

Jaman, S., Verbrugge, B., Hernandez Garcia, O., Abdel Monem, M., Oliver, B., Geury, T. & Hegazy, O., 7 Oct 2022, In: *Energies*. 15, 19, p. 1-24 24 p., 7364.

### **A Cloud-Connected In Situ Junction Temperature Measurement of a SiC Power MOSFET Module**

Hasan, M. M., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., 6 Oct 2022. 1 p.

### **Real-Life Mission Profile Oriented Lifetime Estimation of a SiC Interleaved Bidirectional HV DC/DC Converter for Electric Vehicle Drivetrains**

Chakraborty, S., Hasan, M. M., Paul, M., Tran, D. D., Geury, T., Davari, P., Blaabjerg, A., El Baghdadi, M. & Hegazy, O., 2 Oct 2022, In: *IEEE Journal of Emerging and Selected Topics in Power Electronics*. 10, 5, p. 5142 - 5167 26 p., Volume: 10, Issue: 5.

### **Modelling and Control of a 50kW SiC-based Isolated DAB Converter for Off-Board Chargers of Electric Vehicles**

Rasool, H., Tran, M. T., Chakraborty, S., Van Mierlo, J., Geury, T., El Baghdadi, M. & Hegazy, O., 9 Sep 2022, *24th European Conference on Power Electronics and Applications, EPE 2022 ECCE Europe*. Hanover, Germany: IEEE, p. P1-P9 9 p. (24th European Conference on Power Electronics and Applications, EPE 2022 ECCE Europe).

### **Review of Fault Tolerant Multi-Motor Drive Topologies for Automotive Applications**

Al Sakka, M., Geury, T., El Baghdadi, M., Dhaens, M., Al Sakka, M. & Hegazy, O., 29 Jul 2022, In: *Energies*. 15, 15, 24 p.

### **Review on Integrated On-Board Charger-Traction Systems: V2G Topologies, Control Approaches, Standards and Power Density State-of-the-Art for Electric Vehicle**

Jaman, S., Chakraborty, S., Tran, D-D., Geury, T., El Baghdadi, M. & Hegazy, O., 25 Jul 2022, In: *Energies*. 15, 15, p. 1-39 39 p., 5376.

### **A Multi-Objective Co-Design Optimization Framework for Grid-Connected Hybrid Battery Energy Storage Systems: Optimal Sizing and Selection of Technology**

Hasan, M. M., Berseneff, B., Meulenbroeks, T., Cantero, I., Chakraborty, S., Geury, T. & Hegazy, O., 24 Jul 2022, In: *Energies*. 15, 15, p. 1-21 21 p., 5355.

### **Real-Time Charging Scheduling and Optimization of Electric Buses in a Depot**

Verbrugge, B., Rauf, A. M., Rasool, H., Abdel-Monem, M., Geury, T., El Baghdadi, M. & Hegazy, O., 9 Jul 2022, In: *Energies*. 15, 14, p. 1-18 18 p., 5023.

### **Direct Predictive Power Control Strategy to Improve Charging and Power Quality of Autonomous Robotic Electric Vehicle Charging Systems**

Rasool, H., Jaman, S., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., 24 Jun 2022, *2022 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)*. Sorrento, Italy: IEEE, p. 574-580 7 p.

### **Impact of Smart Charging on the Reliability of Charging Infrastructure**

Verbrugge, B., Rasool, H., Hasan, M. M., Chakraborty, S., Geury, T., El Baghdadi, M. & Hegazy, O., Jun 2022, *EVS35 Proceedings*. EVS35, p. 1-9 9 p.

### **Small Signal Average Switch Modeling and Dual Loop Control of Bidirectional Integrated Converter for G2V and V2G Application in Battery EVs**

Jaman, S., El Baghdadi, M. (ed.), Chakraborty, S. (ed.), Geury, T. (ed.) & Hegazy, O. (ed.), 30 Mar 2022.

### **Two-layer control approach of a V2G capable off-board charger for electric buses**

Verbrugge, B., Rasool, H., El Baghdadi, M., Geury, T. & Hegazy, O., 30 Mar 2022.

**Design and Real-Time Implementation of a Control System for SiC Off-Board Chargers of Battery Electric Buses**

Rasool, H., Verbrugge, B., Jaman, S., Abramushkina, E., Geury, T., El Baghdadi, M. & Hegazy, O., 16 Feb 2022, In: *Energies*. 15, 4, p. 1-19 19 p., 1434.

**An Interoperable EMS for the Provision of Grid Services with Hybrid Energy Storage Systems**

Unamuno, E., Polat, H., Cabezuelo, D., Galarza, J., Anta, A., Toutain, E., Geury, T. & Hegazy, O., 2022, *IECON 2022 – 48th Annual Conference of the IEEE Industrial Electronics Society*. IEEE, 7 p. (IECON Proceedings (Industrial Electronics Conference); vol. 2022-October).

**Design and Optimization of the Arm Inductor for Modular Multilevel Converter**

Wang, Y., Chakraborty, S., Tran, D-D., Geury, T. & Hegazy, O., 2022, p. 354-359. 6 p.

**Development of Smart Charging Scheduling and Power Management Strategy of a PV-ESS based Scalable EV Charging Station**

Jaman, S., Verbrugge, B., Zhaksylyk, A., Geury, T., El Baghdadi, M. & Hegazy, O., 2022, *Transportation Research Procedia*. Elsevier, 8 p.

**Report on the Design Optimization Framework of the Power Electronics Interfaces**

Hasan, M. M. & Geury, T., 30 Nov 2021, iSTORMY Project Horizon 2020. 33 p.

**Smart Integration of Electric Buses in Cities: A Technological Review**

Verbrugge, B., Hasan, M. M., Rasool, H., Geury, T., El Baghdadi, M. & Hegazy, O., 4 Nov 2021, In: *Sustainability*. 13, 21, 23 p., 12189.

**Design and Implementation of a Multifunctional 6-phase Interleaved Bidirectional DC/DC Converter for Battery Electric Vehicle Applications**

Chakraborty, S., Rasool, H., Tran, D-D., Geury, T., El Baghdadi, M. & Hegazy, O., 25 Oct 2021, *2021 23rd European Conference on Power Electronics and Applications (EPE'21 ECCE Europe)*. IEEE, p. 1-10 10 p.

**Modelling and bi-level control design of a SiC off-board charging system for battery electric buses with V2G capability**

Verbrugge, B., Rasool, H., El Baghdadi, M., Geury, T. & Hegazy, O., 25 Oct 2021, *EPE'21 Proceedings*. IEEE, 10 p. (2021 23rd European Conference on Power Electronics and Applications, EPE 2021 ECCE Europe).

**Small Signal Average Switch Modeling and Dual Loop Control of Bidirectional Integrated Converter for G2V and V2G Applications in Battery EVs**

Jaman, S., El Baghdadi, M., Chakraborty, S., Geury, T. & Hegazy, O., 25 Oct 2021, *23rd European Conference on Power Electronics and Applications*. Ghent, Belgium: IEEE, p. 1-10 10 p. (2021 23rd European Conference on Power Electronics and Applications, EPE 2021 ECCE Europe).

**Reliability and Cost Assessment of Fault-Tolerant Inverter Topologies for Multi- Motor Drive Systems**

Al Sakka, M., Geury, T., Dhaens, M., Al Sakka, M., El Baghdadi, M. & Hegazy, O., 6 Sep 2021, *2021 23rd European Conference on Power Electronics and Applications: EPE'21 ECCE Europe*. IEEE, 10 p. (2021 23rd European Conference on Power Electronics and Applications, EPE 2021 ECCE Europe).

**A Thorough Review of Cooling Concepts and Thermal Management Techniques for Automotive WBG Inverters: Topology, Technology and Integration Level**

Abramushkina, E., Zhaksylyk, A., Geury, T., El Baghdadi, M. & Hegazy, O., 13 Aug 2021, In: *Energies*. 14, 16, p. 1-21 21 p., 4981.

**The Application of Ant Colony Optimization: Book Chapter2: Application of Ant Colony Optimization for Co-Design of Hybrid Electric Vehicles**

Vafaeipour, M., Tran, D-D., Geury, T., El Baghdadi, M. & Hegazy, O., 28 Jun 2021, Intech Open Access. 18 p.

**Design and Technical Assessment of Local Electrical Storage Systems in Double-Fed Generators for Wind Turbine Power System Applications**

Aksoz, A., Benomar, Y., Geury, T., El Baghdadi, M., Hegazy, O., Ozturk, S. B. & Colak, I., 24 Jun 2021, *2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021*. p. 1-6 6 p. 9456665. (2021 16th

International Conference on Ecological Vehicles and Renewable Energies, EVER 2021).

**Comparative Analysis of Traction Inverter Controllers for the Mission-Profile Oriented Reliability and Performance Evaluation in Electric Vehicles**

Zhaksylyk, A., Chakraborty, S., Abramushkina, E., Geury, T., El Baghdadi, M. & Hegazy, O., 23 Jun 2021, *2021 Sixteenth International Conference on Ecological Vehicles and Renewable Energies (EVER)*. IEEE, p. 1-5 5 p. 9456616. (2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021).

**Multiobjective GA Optimization for Energy Efficient Electric Vehicle Drivetrains**

Chakraborty, S., Padmaji, V., Tran, D-D., Araujo, J. A. C., Geury, T., El Baghdadi, M. & Hegazy, O., 23 Jun 2021, *2021 Sixteenth International Conference on Ecological Vehicles and Renewable Energies (EVER)*. IEEE, p. 1-7 7 p. 9456619. (2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021).

**Performance Enhancement of a Battery-Grid Connected SiC MMC for DC Microgrid Systems**

Wang, Y., Aksoz, A., Geury, T., El Baghdadi, M. & Hegazy, O., 23 Jun 2021, *2021 Sixteenth International Conference on Ecological Vehicles and Renewable Energies (EVER)*. IEEE, p. 1-6 6 p. 9456612. (2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021).

**Virtual Sensing-Based Control Design of a SiC Off-Board Charging System for Electric Bus Applications**

Rasool, H., Tran, M. T., Geury, T., El Baghdadi, M. & Hegazy, O., 23 Jun 2021, *Virtual Sensing-Based Control Design of a SiC Off-Board Charging System for Electric Bus Applications*. Monte-Carlo, Monaco: IEEE, p. 1-8 8 p. 9456641. (2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021).

**Design Optimization and Electro-thermal Modelling of an Off-Board Charging System for Electric Bus Applications**

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**Emissions and Total Cost of Ownership Assessment of Hybrid Propulsion Concepts for Bus Transport with CNG or Diesel Engine**

Landersheim, V., Tran, D. D., Pham, T., Manushyna, D., Geury, T., Wilkins, S. & Hegazy, O., 5 May 2021, *2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021*. Institute of Electrical and Electronics Engineers Inc., 9456607. (2021 16th International Conference on Ecological Vehicles and Renewable Energies, EVER 2021).

**Evaluation of Model Predictive Control for IPMSM using High-Fidelity Electro-thermal Model of Inverter for Electric Vehicle Applications**

Zhaksylyk, A., Rauf, A. M., Chakraborty, S., El Baghdadi, M., Geury, T., Ciglaric, S. & Hegazy, O., 6 Apr 2021, *SAE WCX Digital Summit*. 2021 ed. SAE International, p. 1-8 (SAE Technical Papers).

**A Review of Modular Multilevel Converters for Stationary Applications**

Wang, Y., Aksoz, A., Geury, T., Ozturk, S. B., Kivanc, O. C. & Hegazy, O., Nov 2020, In: *Applied Sciences*. 10, 21, p. 1-36 36 p., 7719.

**Indirect Matrix Converter-Based Grid-Tied Photovoltaics System for Smart Grids**

Geury, T., Pinto, S., Gyselinck, J. & Wheeler, P., 16 Oct 2020, In: *Energies*. 13, 20, p. 5405-5423 18 p., 5405.

**Dual-loop Control Scheme with Optimized Type-III Controller based on Genetic Algorithm for 6-phase Interleaved Converter in Electric Vehicle Drivetrains**

Tran, D-D., Chakraborty, S., Geury, T., Van Mierlo, J., El Baghdadi, M. & Hegazy, O., 11 Sep 2020, *EPE'20 ECCE EUROPE*. 9215809. (2020 22nd European Conference on Power Electronics and Applications, EPE 2020 ECCE Europe).

**Comparative Analysis of Single-Input Multi-Output Inverter Topologies for Multi-motor Drive Systems**

Al Sakka, M., Geury, T., Chakraborty, S., El Baghdadi, M., Hegazy, O., Al Sakka, M. & Dhaens, M., 10 Sep 2020, *proceedings of 2020 Fifteenth International Conference on Ecological Vehicles and Renewable Energies (EVER)*. IEEE, 12 p. 9243097

### **Fast Active Balancing System using Multi-level DC Converter for Efficient AC-coupled Battery Systems in Stationary Applications**

Rauf, A. M., Abdel Monem, M., Geury, T., El Baghdadi, M. & Hegazy, O., 10 Sep 2020, *2020 15th International Conference on Ecological Vehicles and Renewable Energies, EVER 2020*. Institute of Electrical and Electronics Engineers Inc., p. 1-8 8 p. 9243137. (2020 15th International Conference on Ecological Vehicles and Renewable Energies, EVER 2020).

### **Masterless Control of Parallel Modular Active front-end (AFE) Systems for Vehicles and Stationary Applications**

Zhaksylyk, A., Rasool, H., Geury, T., El Baghdadi, M. & Hegazy, O., 10 Sep 2020, *2020 15th International Conference on Ecological Vehicles and Renewable Energies, EVER 2020*. EVER, p. 1-6 6 p. 9242540. (2020 15th International Conference on Ecological Vehicles and Renewable Energies, EVER 2020).

### **Design and Implementation of FPGA-based Digital Controllers for SiC Multiport Converter in Electric Vehicle Drivetrains**

Tran, D-D., Geury, T., El Baghdadi, M., Van Mierlo, J. & Hegazy, O., 28 Nov 2019, *2019 21st European Conference on Power Electronics and Applications, EPE 2019 ECCE Europe*. IEEE, p. 1-7 7 p. 8914795. (2019 21st European Conference on Power Electronics and Applications, EPE 2019 ECCE Europe).

### **Development of an Energy Management Strategy and Sizing Algorithm for a Nanogrid Parking Lot for Electric Vehicles**

Verbrugge, B., Abdel Monem, M., El Baghdadi, M., Geury, T., Hegazy, O. & Van Mierlo, J., May 2019, *EVS32 Proceedings*. EVS32, 11 p.

### **Optimal Design of Hybrid PV-Battery System in Residential Buildings: End-User Economics, and PV Penetration**

Worighi, I., Geury, T., Hegazy, O., El Baghdadi, M., Van Mierlo, J. & Maach, A., 1 Mar 2019, In: *Applied Sciences*. 9, 5, p. 1022-1032 11 p., 1022.

### **Direct control method for a PV system integrated in an Indirect Matrix Converter-based UPQC**

Geury, T., Pinto, S. & Gyselinck, J., Aug 2016, *2016 IEEE Smart Energy Grid Engineering (SEGE)*. IEEE, p. 117-122

### **An indirect matrix converter-based unified power quality conditioner for a PV inverter with enhanced power quality functionality**

Geury, T., Pinto, S., Gyselinck, J. & Wheeler, P., Nov 2015, *2015 IEEE Innovative Smart Grid Technologies - Asia (ISGT ASIA)*. IEEE, p. 1-8 8 p.

### **Testing the Enhanced Functionalities of Commercial PV Inverters Under Realistic Atmospheric and Abnormal Grid Conditions**

Lopez Erauskin, R., Geury, T., Gonzalez Fernandez De Bobadilla, A., Gyselinck, J., Hervas, M. E. & Fabre, A., 19 Oct 2015, *Testing the Enhanced Functionalities of Commercial PV Inverters Under Realistic Atmospheric and Abnormal Grid Conditions*. 5th Solar Integration Workshop, p. 1-7 7 p.

### **Current source inverter-based photovoltaic system with enhanced active filtering functionalities**

Geury, T., Pinto, S. & Gyselinck, J., 2015, In: *Journal of Power Electronics*. 8, 12, p. 2483-2491

### **Three-phase power controlled PV current source inverter with incorporated active power filtering**

Geury, T., Pinto, S. & Gyselinck, J., Nov 2013, *IECON 2013 - 39th Annual Conference of the IEEE Industrial Electronics Society*. Vienna: IEEE Industrial Electronics Society, p. 1372-1377 10.1109/IECON.2013.6699333

### **Emulation of Photovoltaic arrays with shading effect for testing of grid-connected inverters**

Geury, T. & Gyselinck, J., Sep 2013, *2013 15th European Conference on Power Electronics and Applications (EPE)*. IEEE, p. 1-9 9 p.

## **Projects**

### **EUAR27: Electric Vehicle Charging Infrastructure for improved User Experience**

Hegazy, O., Coosemans, T., Vanhaverbeke, L., De Cauwer, C., Geury, T., El Baghdadi, M., Van Krieking, G., Jaman, S., Nuytens, J. A., Mesquita Bordalo Da Costa, D. & Vranckx, A.

1/05/20 → 30/04/24

**EU581: ACHILES: Advanced Architectures Chassis/Traction concept for Future Electric vehicles**

Hegazy, O., El Baghdadi, M., Van Mierlo, J., Geury, T., Firouz, Y., Heidari Gandoman, F., Rauf, A. M., Youssef, R., Berecibar, M. & De Sutter, L.

European Commission

1/12/18 → 30/11/22

**EUAR176: BATSS : SAFE EFFICIENT BATTERY SYSTEM BASED ON ADVANCED CELL TECHNOLOGY**

Hegazy, O., Chakraborty, S., Varga, E. F., Verbrugge, B. & Geury, T.

1/01/24 → 31/12/26

**BRGCON15: Connect 2020: iSTORMY : Interoperable, modular and smart hybrid energy storage system for stationary applications**

Hegazy, O. & Geury, T.

21/01/20 → 20/04/20

**BRGCON27: Connect 2022: PEM4CS: Next generation SiC-based Power Electronics Modules (half-bridges)**

Hegazy, O., Geury, T. & Varga, E. F.

6/11/21 → 5/01/22

**EUAR110: EBRT2030 : European Bus Rapid Transit of 2030: electrified, automated, connected.**

Hegazy, O., Geury, T., Chakraborty, S., Hasan, M. M. & Varga, E. F.

1/01/23 → 31/12/26

**EUAR147: EcoMobility : Intelligent, Safe and secure connected Electrical Mobility solutions: Towards European Green Deal and Seamless Mobility**

Hegazy, O., Geury, T. & Verbrugge, B.

1/05/23 → 30/04/26

**BRGRD45: Experimental Platforms 2020 Preparations: Smart Charging Point**

Hegazy, O. & Geury, T.

1/03/20 → 15/09/20

**EUAR67: Horizon 2020: Highly EFFICIENT and reliable electric drivetrains based on modular, intelligent and highly integrated wide band gap power electronics modules**

Hegazy, O., El Baghdadi, M., Geury, T., Chakraborty, S., Tran, D., Rasool, H. & Polat, H.

1/05/21 → 31/10/24

**EUAR41: H2020: Interoperable, modular and Smart hybrid energy STORAge systeM for stationarY applications**

Hegazy, O., Geury, T., El Baghdadi, M., Chakraborty, S., Polat, H. & Hasan, M. M.

1/12/20 → 31/05/24

**VLFLX6: ICON: AUTONOMOUS ROBOTIC AND EFFICIENT ELECTRIC VEHICLE CHARGING SYSTEMS FOR SMART BUILDINGS AND PARKING LOTS ( BELLA )**

Hegazy, O., Geury, T., El Baghdadi, M., Chakraborty, S., Verbrugge, B. & Vanderborght, B.

1/01/22 → 30/08/23

**IOFPOC47: IOF Proof of Concept: Redirect - Smart and Efficient Driving Circuits for LED lighting Systems and DC Networks in Various Applications**

Jacobs, V. A., Hegazy, O., Geury, T., Tran, M. T. & El Baghdadi, M.

15/07/21 → 14/07/23

**BRGRD65: Joint R&D 2022: Smart Charging Point.**

Hegazy, O., Geury, T. & Delaere, S.

1/12/21 → 28/02/22



**BRGPROV19: Key Digital Solutions: Intelligent, Safe and Secure connected Electrical Mobility solutions: Towards European Green Deal and Seamless Mobility**

Hegazy, O., Van Mierlo, J., Geury, T., Verbrugge, B., Varga, E. F., Chakraborty, S. & Hruz, A.  
1/03/23 → 28/02/26

**EUAR111: NEMOSHIP : New modular Electrical architecture and digital platform to Optimise large battery systems on SHIPs**

Hegazy, O., Geury, T., Tran, D., Abramushkina, E. & Jaman, S.  
1/01/23 → 31/12/26

**EUAR80: NextETRUCK : Efficient and affordable Zero Emission logistics through NEXT generation Electric TRUCKs.**

Hegazy, O., Varga, E. F., Geury, T., El Baghdadi, M., Tran, D., Ghadirzadeh, A. & Hruz, A.  
1/07/22 → 31/12/25

**BRGPROV9: OOI Project- ECSEL: HiEfficient**

Hegazy, O., Van Mierlo, J., El Baghdadi, M., Geury, T., Egin Martin, G., Hosseinabadi, F. & Bhoi, S. K.  
1/05/21 → 31/10/24

**EUAR132: OPEVA - OPTimization of Electric Vehicle Autonomy**

Hegazy, O., Geury, T., Varga, E. F., El Baghdadi, M. & Zhaksylyk, A.  
1/01/23 → 31/12/25

**EU517: ORCA - Optimised Real-world Cost-Competitive Modular Hybrid Architecture for Heavy Duty Vehicles (ORCA)**

Hegazy, O., Van Mierlo, J., Van Mierlo, J., Omar, N., Messagie, M., Van Hoyweghen, S., Rahbari, O., De Sutter, L., Tran, D., Mayet, C., Varga, E. F., Geury, T. & Berecibar, M.  
European Commission  
1/10/16 → 30/09/21

**SOCMAAK18: SBO project: ModulAr - Design and validation of modular drivetrain architectures**

Hegazy, O., El Baghdadi, M., Van Mierlo, J., Geury, T. & Zhaksylyk, A.  
1/09/19 → 29/02/24

**EUAR97: SiC4GRID : NEXT GENERATION MODULAR SiC-BASED ADVANCED POWER ELECTRONICS CONVERTERS FOR ENHANCED RENEWABLES INTEGRATION INTO THE GRID**

Hegazy, O., Geury, T., Varga, E. F., Zhaksylyk, A. & Chakraborty, S.  
1/10/22 → 31/03/26