



## Europass Curriculum Vitae

### Personal information

First name(s) / Surname(s) **Mihai Vasile SANDULEAC**

Nationality Romanian

Gender Male

### Work experience

- |                                      |  |
|--------------------------------------|--|
| Dates                                | 01/10/2017 → present   |
| Occupation or position held          | <i>Associate Professor, Dept. of Electrical Power Systems</i>  |
| Main activities and responsibilities | To teach at the Faculty of Power Engineering, Dept. of Electrical Power Systems, main courses for Master degree: Advanced Techniques in Power Systems – FACTS and AI, Digital systems and SCADA in Power Systems, Electrical energy storage technologies and Electrical vehicles, Information and communication technologies, Smart energy transport systems, course for Bachelor degree: SCAAD systems in control of energy processes.<br>Research in the Horizon 2020 project <i>Wedistrict</i> , developing an integrated solution that exploits the combination of RES, thermal storage and waste heat recycling technologies to satisfy 100% of the heating and cooling energy demand in District Heating and Cooling networks. |
| Name and address of employer         | <b>University Politehnica of Bucharest</b><br>Splaiul Independentei 313, Bucharest (Romania)   |
| Type of business or sector           | University   |
| Dates                                | 01/11/2016 → 01/10/2017  |
| Occupation or position held          | <i>Lecturer, Dept. of Electrical Power Systems</i>   |
| Main activities and responsibilities | To teach at the Faculty of Power Engineering, Dept. of Electrical Power Systems  |
| Name and address of employer         | <b>University Politehnica of Bucharest</b><br>Splaiul Independentei 313, Bucharest (Romania)   |
| Type of business or sector           | University   |
| Dates                                | 01/10/2016 → present   |
| Occupation or position held          | <i>Reseracher for European projects in Romanian Energy Center</i>  |

Main activities and responsibilities	Research and consultancy in the Horizon 2020 projects: SUCCESS, WiseGRID, RESERVE, NRG5
Name and address of employer	<b>Centrul Roman al Energiei (Romanian Energy Center)</b> Bucharest (Romania)
Type of business or sector	Research, consultancy in H2020 projects
Dates	01/10/2016 → 30/06/2018
Occupation or position held	<i>R&amp;D Director in EXENIR SRL</i>
Main activities and responsibilities	Research and consultancy in power engineering
Name and address of employer	<b>EXENIR SRL</b> Bucharest (Romania)
Type of business or sector	Research, consultancy
Dates	01/04/2004 → 31/09/2016
Occupation or position held	<i>Technical director till 2014, R&amp;D director from 2015</i>
Main activities and responsibilities	-To participate to the company overall strategy definition and implementation; -To coordinate a team of highly qualified consultants; -To coordinate R&D activity of the company
Name and address of employer	<b>ECRO SRL</b> Bucharest (Romania)
Type of business or sector	Consultancy and Research
Dates	01/01/2001 - 31/03/2004
Occupation or position held	<i>Sales manager Transport and Distribution</i>
Main activities and responsibilities	-Responsible for business development of Siemens Transport and Distribution (T&D in Romania); -To coordinate the Siemens T&D activity in Romania; -To provide project management for transmission and distribution turn-key projects
Name and address of employer	<b>SIEMENS SRL</b> Bucharest (Romania)
Type of business or sector	Sales and business development
Dates	01/09/1997 - 31/12/2000
Occupation or position held	<i>Consultant and business agent</i>
Main activities and responsibilities	Meters and metering systems business development, SCADA/DMS business development
Name and address of employer	<b>LANDIS GYR</b> Zug (Switzerland)
Type of business or sector	Consultancy
Dates	01/03/1995 - 31/03/1997
Occupation or position held	<i>Technical and Strategy Manager</i>
Main activities and responsibilities	-To take responsibility of technical aspects; -To coordinate a team of highly qualified professionals; -To concept and develop a complete SCADA and digital protection family of equipment and related software for power substation MV and HV field -ISO 9001 responsible in the company
Name and address of employer	<b>Telecomm SRL</b> Bucharest (Romania)

Type of business or sector	R&D
Dates	01/10/1987 - 28/02/1993
Occupation or position held	<i>Head of research in Power Systems Laboratory</i> , other positions
Main activities and responsibilities	-To manage the overall activity of the laboratory; -To lead studies related to the integration of Romanian power system in UCTE; -To lead the development of critical power-systems applications for power system stability and optimization
Name and address of employer	<b>ICEMENERG BUCURESTI (The Romanian Research and Modernizing Institute for Energy)</b> Bucharest (Romania)
Type of business or sector	R&D
Dates	01/10/1985 - 30/09/1987
Occupation or position held	Engineer
Main activities and responsibilities	<i>Maintenance of the automation and protections in high voltage substations</i>
Name and address of employer	High Voltage Electrical Network Enterprise <b>EREIT Bucuresti</b> Bucharest (Romania)
Type of business or sector	Maintenance

### Education and training

Dates	01/03/1991 - 01/02/1998
Title of qualification awarded	<b>PhD in Power Engineering</b>
Principal subjects / occupational skills covered	Doctoral thesis: Real time expert system for disturbances analysis in electric substations and electric networks
Name and type of organisation providing education and training	Polytechnic Institute of Bucharest (Polytechnic Institute) Bucharest (Romania)
Dates	15/09/1980 - 15/06/1985
Title of qualification awarded	<b>M. Sc. Power Engineering</b>
Principal subjects / occupational skills covered	Polytechnic Institute of Bucharest, Faculty of Power Engineering, Power Engineering Section
Name and type of organisation providing education and training	Polytechnic Institute of Bucharest, Faculty of Power Engineering (Polytechnic Institute) Bucharest (Romania)

### Personal skills and competences

Mother tongue(s) **Romanian**

Other language(s)

Self-assessment

**English**

**French**

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user
C2	Proficient user	C2	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user

Social skills and competences	Team spirit Good communications skills
Organisational skills and competences	Leadership (teams of 5 - 15 people) Good experience in project management
Technical skills and competences	Specialised in Smart metering, Smart grids, power systems, ICT systems, renewables integration, SCADA systems, protection relays, automation, energy markets, artificial intelligence in energy Good command of quality control processes, as I have been in two positions responsible for quality management in my company)
Computer skills and competences	Software development in various languages (Pascal, C, C++, Prolog, Java, Assembly etc.) Good command of Office tools
Artistic skills and competences	Guitar playing (voluntary activity), music enthusiast, fundamental Physics enthusiast
Other skills and competences	Hobby in electronics (voluntary activity) Hobby in gardening (voluntary activity)
Driving licence(s)	B
<b>Additional information</b>	<p><b>Selected / relevant projects and activities</b></p> <ul style="list-style-type: none"> <li>- <b>FENIX</b> (Flexible electricity networks to integrate the expected 'energy evolution'), an FP6 European R&amp;D Project which dealt with Virtual Power Plants for the energy sector, as <i>Smart Grid application</i> to aggregate and optimize distributed generation and to use it in energy and energy services markets, project rolled during the 2006-2009 period together with distribution grid companies such as Iberdrola, EdF and with energy systems providers such as Siemens and Areva.</li> <li>- <b>SIRIUS - Smart Grid Solutions</b> platform in CCPP Brazi gas power plant to assist a <i>Virtual Power Plant</i> functionality together with Hidroelectrica hydro-company (system commissioned in 2011).</li> <li>- <b>Advanced Metering Reading (AMR) system</b> for around 2000 metering points with OMV-Petrom, integrating <i>energy metering for billing and some extensions of Smart Metering</i> related to instrumentation data readout and handling local alarms (system commissioned with 1000 metering points in 2007 and continuously improved and extended during time).</li> <li>- <b>Smart Metering system</b> for around 250 metering points in Pitesti city, integrating <i>energy metering for billing and real-time consumption and energy quality survey</i> as well as <i>intelligent street-lighting functionalities</i> (system commissioned in 2011 and improved during time with new functionalities).</li> <li>- <b>Study and simulations</b> for Transelectrica (the Romanian TSO) regarding <i>Virtual Power Plant</i> technology applied for coupling Wind Power Plants – as stochastic production, with controllable hydro-plants (2012).</li> <li>- <b>Development</b> of a <i>Smart City concept</i> for <b>Sibiu</b> city, dealing with multi-steram energy contours, energy awareness and energy services for different stakeholders (started in 2012, in preparation for funding).</li> </ul>

- **Energy and ICT domain Expert** for consultancy and reviewing activity for **European Commission**, related to *Smart Grid*, *Smart Meters*, renewable energy, *Smart Cities and ICT* use in energy domain, selected for many EC projects in the period 2011 – 2014, in FP7 and Marie Curie frameworks.
  
- **Member** in the European Technology Platform for Electricity Networks of the Future, also called **ETP SmartGrids**, in Working Group 3 (WG3) "*Demand and Metering/Retail*", at teh European Commission in Brussels.
  
- **Participation** in European Commission **COST** actions related to Smart Grid solutions, namely in Action MP1004 – WG4, Hybrid energy storage solutions for stationary (energy techniques) applications.
  
- **NOBEL GRID**, a H2020 project started in 2015 and finalized in 2018, with the aim to develop, deploy and evaluate advanced tools and ICT services for Distribution System Operators and electric cooperatives, enabling active consumers' involvement and the adoption of a flexible and low-cost architecture for smart metering systems, acting as technological manager of the project and leading the smart metering systems subproject.
  
- **Storage4Grid**, a H2020 project started in December 2016 and finalized in March 2020, acting as project manager from University Politehnica of Bucharest and technical manager of the whole project; the project developed concepts and lab trials for Advanced Resilient Prosumers and energy communities using energy routers, mixed AC and DC networks, local production and storage. Acting also as the Technical manager of the Storage4Grid project.
  
- **SUCCESS**, a H2020 project started in May 2016 and finalized in November 2018, acting as metering and IT specialist related to Smart metering / Smart grid cyber security solutions and developments
  
- **RESERVE** a H2020 project started in November 2016 and finalised in October 2019, acting as member of the University Politehnica of Bucharest team.
  
- **Wedistrict**, a H2020 project started in October 2019 and developing an integrated solution that exploits the combination of RES, thermal storage and waste heat recycling technologies to satisfy 100% of the heating and cooling energy demand in District Heating and Cooling networks.
  
- **Vice-President** of Romanian organisation of CIGRE since May 2022, member in CIGRE WG B4.91 – Power electronics-based Transformers (PE).
  
- **Member** of Romanian organisations of CIGRE and World Energy Council WEC, member of the Romanian Standardisation body ASRO.
  
- **Member** in IEEE Power and Energy Society (PES) and IEEE Instrumentation and Measurement Society (IMS).

## Additional information

### Published papers:

- Recursive Discrete Transformations Applied in Energetics; *Energetica Revue*, Romania 9/1988
- ProCLog - An Object Oriented Programming Language for Expert Systems Development; Second International Workshop on Electric Power System Control Centres. ALGHERO, ITALY, June 16 - 18, 1993
- An Introduction to Expert Systems - General Aspects.; First Romanian Round-Table on Expert Systems Applications in Power Systems; *Energetica Revue*, Oct.1993
- Online Monitoring and Offline Analysis of the Harmonic State; Paper 36-303 of Session CIGRE'96 – PARIS, FRANCE, September 1996
- Metering Billing and Settlement of Ancillary Services; Paper at Metering Europe 2004 – Berlin, Germany, 28-30 September 2004
- Sub-transmission IPP automation and control for EMS functionality support, RO-CIGRE, 2007, June 28-29, Sibiu
- Virtual Power Plants – solution for efficient integration of distributed energy resources, *Energetica Revue*, 2009

- Integration of Distributed Energy Resources in the National Power System, using Virtual Power Plant concept, as part of emerging Smart Grid technologies. Case Study: Sibiu regional network, accepted for the conference GCC CIGRE POWER 2010, Doha, October 2010, Qatar
- Hybrid energy storage solutions for stationary applications, IRES 2011, November 28-30, Berlin (Joao Martins, Mihai Sanduleac)
- Integrating the Electrical Vehicles in the Smart Grid through Unbundled Smart Metering and multi-objective Virtual Power Plants, IEEE PES, Manchester, December 2011
- Smart Grid – Patterns of fractality, Energetica Revue, 2012
- Probabilistic Energy Services – A study of the concept, Deregulated Electricity Market Issues in South-Eastern Europe - DEMSEE 2012 Conference - 21 September 2012, Bucharest
- Concepts of Democracy in Power Systems – a Vision within the Smart Grid Paradigm, Romanian Energy Center – Info Days Energy, R&D, ICT, 27-28.09.2012, Romanian Academy
- Smart Meters – A critical review, Smart Grid Conference, 7-9.11.2012, Sibiu, Romania
- Transforming Big Data into Collective Awareness, Pitt J, Sanduleac M. and all, Computer (Volume:46, Issue: 6, IEEE Computer Society), June 2013, ISSN 0018-9162
- Integration of the Wind Power Plants into the Power System operation by using the Virtual Power Plant concept, FOREN 2012, 18-20 June, 2012, Ungureanu Monica, Mihailescu Florentina, Benghea Lucian, Sanduleac Mihai
- Solution for impact reduction over safe operation of PS by the integration of a large volume of wind power plants, RSEEC 2012 (Biannual Regional South East European Conference, organized by RO-Cigre), 10-12 October 2012,, Monica Ungureanu,, Florentina Mihailescu,, Mihai Sanduleac
- Rural Sustainability Project. A holistic approach electricity and services, FOREN 2014 - "Tomorrow's Energy: From Vision to Reality" (Gal Stelian, Sanduleac Mihai, Florea Monica, Dobre Ion, Radu Ghinea
- Power Quality Assessment in LV networks using new Smart Meters design, Mihai Sanduleac , Mihaela Albu , Joao Martins, M<sup>a</sup> Dolores Alacreu, Carmen Stanescu, CPEE 2015, June 24-26, 2015
- Measurement of Energies within f-P Secondary Control by the Means of Metrological Procedures, for ATEE 2015, Catalin Lucian Chimirel, Mircea Eremia, Mihai Sanduleac, THE 9th INTERNATIONAL SYMPOSIUM ON ADVANCED TOPICS IN ELECTRICAL ENGINEERING, May 7-9, 2015, Bucharest, Romania
- Automating Remote Grid Acceptance and Energy Services Tests suited for large deployments of PV systems in active distribution networks, The 41st Annual Conference of the IEEE Industrial Electronics Society IECON 2015, 9th -12th November, 2015, Yokohama, Japan
- Medium/Low Voltage Smart Grid Observability and PQ assessment with Unbundled Smart Meters to be presented at IEEE International Energy conference ENERGYCON 2016, 4-8 April, 2016, Leuven, Belgium
- The Unbundled Smart Meter concept in a synchro-SCADA framework, paper accepted for I2MTC - 2016 International Instrumentation and Measurement technology Conference, May 23-26, 2016, Taipei, Taiwan
- A New Approach for Technological Ancillary Services Measurement and Aggregation by Metrological Procedures, 18th Mediterranean Electrotechnical Conference – MELECON 2016, April 18-20, 2016, Limasol, Cyprus
- Metrology based Measurement of Voltage Control services provided by advanced Power Generation modules, CPE-POWERENG 2016, Bydgoszcz, 29.06-01.07 2016
- Syncretic use of smart meters for Power Quality monitoring in emerging networks, IEEE Transactions on Smart Grids, Volume 1, 2017

- Supporting Market Solutions by Calculating Ancillary Services and Quality of Service with Metrology Meters, IEEE PES ISGT Europe 2016, September 2016, Ljubljana
- Energy Ecosystem in Smart Cities – Privacy and Security solutions for Citizen’s engagement in a Multi-Stream Environment, IEEE ICS2, 2016, Trento, Italy
- National and inter-TSO Balancing and Ancillary Services Markets Within a Pyramid of Energy Services, IET MEDPOWER 2016, 6-9 November 2016, Belgrade, Serbia
- Resilient Prosumer Scenario in a Changing Regulatory Environment—The UniRCon Solution, Energies 2017, 10(12)
- A perspective on 50% solar power evolution to support 100% CO2 free electrical energy production, 9th International Renewable Energy Congress (IREC), MAR 20-22, 2018, Hammamet, TUNISIA
- Analytical derivation of PQ indicators compatible with control strategies for DC microgrids, Published in: 2017 IEEE Manchester PowerTech, 18-22 June 2017, Manchester, UK
- Hybrid AC and DC smart home resilient architecture Transforming prosumers in UniRCons, Published in: 2017 International Conference on Engineering, Technology and Innovation (ICE/ITMC), 27-29 June 2017, Funchal, Portugal
- Unbundled Smart meters in the new smart grid era Assessment on compatibility with European standardisation efforts and with IoT features, 2018 19TH IEEE Mediterranean Electrotechnical Conference (IEEE MELECON’18)
- On the virtual inertia provision by BESS in low inertia power systems, 2018 IEEE International Energy Conference (ENERGYCON), 3-7 June 2018, Limassol, Cyprus, Published in: 2018 IEEE International Energy Conference (ENERGYCON)
- *Energy Storage Needs for Clean Power Systems and the Potential Support from Electrical Vehicles : A Simplified Assessment on Romanian Case*, 2018 International Conference and Exposition on Electrical And Power Engineering (EPE), 18-19 Oct. 2018, Iasi, Romania, DOI: 10.1109/ICEPE.2018.8559801
- *A Cost Effective Boost Converter for a Hybrid Low- Voltage Neighbourhood Network*, 18-19 Oct. 2018, Iasi, Romania, DOI: 10.1109/ICEPE.2018.8559799
- *SMART CITY: Definition and Evaluation of Key Performance Indicators*, 18-19 Oct. 2018, Iasi, Romania, DOI: 10.1109/ICEPE.2018.8559801
- Smart Meters, PMU and PQ data analysis in Active Distribution Grids – Case Studies in MV networks, 4-6 Oct. 2018, Craiova, Romania, DOI: 10.1109/ICATE.2018.8551426
- *Future Power Systems - the importance and rationale of enforcing and segmenting the electrical energy grid*, 2018 International Conference on Power System Technology (POWERCON), 6-8 Nov. 2018, Guangzhou, China, DOI: 10.1109/POWERCON.2018.8601854
- *Resilient and Immune by Design Microgrids Using Solid State Transformers*, Energies 2018, 11(12), 3377; <https://doi.org/10.3390/en1123377>, WOS:000455358300138
- *On the Electrostatic Inertia in Microgrids with Inverter-Based Generation Only-An Analysis on Dynamic Stability*, Energies, Volume: 12, Issue: 17
- *Solar-Based Energy Resilience in Future Cities - A Preliminary Study in the Sub-Sunbelt Region*, 11th International Symposium on Advanced Topics in Electrical Engineering (ATEE), MAR 28-30, 2019, Bucharest, ROMANIA
- *Optimal Allocation of Energy Storage Systems for Resilient Distribution Networks Focusing on Critical Loads*, 11th International Symposium on Advanced Topics in Electrical Engineering (ATEE), MAR 28-30, 2019, Bucharest, ROMANIA

- *Fault Analysis of a High Voltage Direct Current Link Using Detailed Equivalent Models for Modular Multilevel Converters*, 2019 8th International Conference on Modern Power Systems (MPS), 21-23 May 2019, Cluj Napoca, Romania
  - *Economic Benefits of Energy Storage and Price-aware Demand Response for Future Smart Cities*, 2019 54th International Universities Power Engineering Conference (UPEC), 3-6 Sept. 2019, Bucharest, Romania
  - *Optimal BESS Scheduling Strategy in Microgrids Based on Genetic Algorithms*, 2019 IEEE Milan PowerTech, 23-27 June 2019
  - *Innovative Tools for Demand Response Strategies: a Real-Life Experience*, 2019 IEEE International Conference on Environment and Electrical Engineering and 2019 IEEE Industrial and Commercial Power Systems Europe (EEEIC / I&CPS Europe), 11-14 June 2019, Genova, Italy
  - *Prosumers optimally adapted to local load. Rationale and benefits for the grid*, 2019 8th International Conference on Modern Power Systems (MPS), 21-23 May 2019, Cluj Napoca, Romania
  - *Optimal Allocation of Energy Storage Systems for Resilient Distribution Networks Focusing on Critical Loads*, 11th International Symposium on Advanced Topics in Electrical Engineering (ATEE), MAR 28-30, 2019, Bucharest
  - *On the Electrostatic Inertia in Microgrids with Inverter-Based Generation Only-An Analysis on Dynamic Stability*, Energies, Volume: 12, Issue: 17
  - *PV Panels Tilt Angle Assessment under Restricted Area Conditions and Resilience in a Romanian Case*, 2020 International Conference and Exposition on Electrical And Power Engineering (EPE), 22-23 Oct. 2020 , Iasi, Romania
  - *State of the Art of Hybrid AC-DC Medium Voltage Grids*, 2021 10th International Conference on ENERGY and ENVIRONMENT (CIEM), 14-15 Oct. 2021 , Bucharest, Romania
  - *Short Term Daily Storage Need Assessment for a Large PV Deployment Scenario - Preliminary Case Study for Republic of Moldova*, 2021 10th International Conference on ENERGY and ENVIRONMENT (CIEM), 14-15 Oct. 2021 , Bucharest, Romania
  - *Land Use Potential for PV Production in Synergy with Agriculture - Preliminary Analysis for Romania*, 2021 10th International Conference on ENERGY and ENVIRONMENT (CIEM), 14-15 Oct. 2021, Bucharest, Romania
  - *Islanded Microgrids control by using Grid Former and Synthetic Slack Bus concept - A preliminary analysis*, 2021 International Conference on Electromechanical and Energy Systems (SIELMEN), 6-8 Oct. 2021 , Iasi, Romania
  - *Increasing System Flexibility through a Combination of Pumped-Hydro and Battery-Storage Systems. An Overview of Possible Developments*, 2021 International Conference on Electromechanical and Energy Systems (SIELMEN), 6-8 Oct. 2021, Iasi, Romania
  - *Guest Editorial: Smart Meters in the Smart Grid of the Future*, IEEE Transactions on Industrial Informatics ( Volume: 18, Issue: 1, Jan. 2022)
  - *High Reporting Rate Smart Metering Data for Enhanced Grid Monitoring and Services for Energy Communities*, IEEE Transactions on Industrial Informatics ( Volume: 18, Issue: 6, June 2022)
- Co-author at the following books:**
- Modern issues regarding measurement in Power Systems, Bucharest 2001, Technical Publishing House
  - Engineering the Future, chapter Energy and information, 2010, SCIYO Publishing House
  - FACTS Devices: Concepts and applications in Power Systems, AGIR Publishing Hosue, 2017, written in Romanian language, ISBN: 978-973-720-682-4, 2017



**Patents:**

- Device for binary status processing with digital filtering. PATENT no. 95517/1988.
- Method and system for electrical distribution network control. PATENT no. 95438/1988.
- Equipment for flicker attenuation in electrical networks. PATENT no. 98424/1989.

**Awards:**

2011 IEEE-PES Chapter Outstanding Engineer Award for Mihai Sanduleac, awarded by IEE PES Romania Chapter (PES stands for Power and Energy Society)

