Andrés Véjar
–Curriculum Vitæ–

✉ a.vejar@gmail.com

🏠 20-247 Lublin, Poland

⚙ Netrix R&D, Lublin
2017 (II-sem.) –

Born on November 19ᵗʰ, 1978

Embedded systems, multiagent systems, biosignal processing, big/scientific data, nonlinear time-series analysis, and metaheuristics. Discrete-event simulation, scientific computing, linear programming and object-oriented programming techniques. Complex systems and artificial intelligence.

Mʏ ʀᴇsᴇᴀʀᴄʜ ɪɴᴛᴇʀᴇsᴛs are focused in interdisciplinary research on complex systems and applied artificial intelligence. Special attention is given to the analysis of big data from technological systems, going further to the design of models, simulations and engineering applications. Important topics are embedded systems, microcontrollers, microcomputers, FPGA, biomedical/biosignal processing, bio-inspired algorithms, multiagent systems and optimization.

Education

2011 **Ph.D., Automation, signal and image processing, and computer engineering**→ Université de Lorraine (Université Henri Poincaré Nancy 1), France: *Adaptive generation of simulation models driven by product-trajectories*. Work developed at CRAN (Research Centre for Automatic Control of Nancy, University Henri Poincaré/CNRS). Advisor: Patrick Charpentier. Internship at CREA (Centre de Recherche en Épistémologie Appliquée, École Polytechnique/CNRS), with C. Taramasco.

2007 **M.Sc.Eng.**→ Universidad de Santiago de Chile: *Study of copper prices behavior and development of a forecasting model*. **Graduated with Maximum Distinction**. Advisor: Miguel Alfaro, Examinators: Pedro Palominos and Richard Weber (DII-UCHILE).

2003 **Industrial Engineer**→ Universidad de Santiago de Chile: *Multispecific marine ecosystem model for chilean fisheries management*. Joint work with Alex Gaete. Advisor: Miguel Alfaro.

Scholarships

Post-doctoral Scholarship of **2013** the Institute of Computer Science. Polish Academy of Sciences

Ph.D. Scholarship of the **2007** President of the Republic of Chile.

Master Scholarship. **2005** University of Santiago of Chile.

Computer Skills

Scientific computing: Simulation, ODEs integrators, Optimization and Visualization Libraries (VTK). Languages: Python (NumPy, SciPy), C/C++, Lisp and VHDL. OS: Linux (Gentoo, Debian). Document edition: LATEX. Emacs user.

Post-Doctoral Research

2013 Systems Research Institute, Polish Academy of Sciences. Marcin Paprzycki's team.

2012 Institute Nationale de la Recherche Agronomique, France. Nathalie Perrot's team.

Professional Experience

2018– Chief System Architect. Hybrid tomography & medical signal processing. Netrix R&D. Lublin. Poland.

2017 (II-sem.) Senior electronics programmer and developer, Netrix R&D. Hybrid tomography applications. Lublin. Poland.

2004–2005 Project Engineer in simulation at SimulArt Ltda.; data analysis, discrete event modeling and simulation on manufacturing processes. Santiago, Chile.

Scientific Experience

2018 Session Chair, *Image and signal processing*. International Interdisciplinary PhD Workshop, IIPhDW'2018, Świnoujście, Poland.

2018-2019 Scientific Committe, Technical Program. International Interdisciplinary PhD Workshop, IIPhDW'2019, Wismar, Germany.

2013 Post-Doctoral Research at Systems Research Institute, Polish Academy of Sciences (IBS-PAN). Multiagent software systems. Marcin Paprzycki's team. Warsaw, Poland.

2012 Post-Doctoral Research at French National Institute for Agricultural Research (INRA). Lipid Oxidation data analysis and inverse chemical kinetics modeling. Nathalie Perrot's team. Paris (CREA-ISCPIF) and Versailles-Grignon (INRA), France.

Teaching Experience

2019– **University of Economics and Innovation in Lublin, Faculty of Transport and Informatics, Institute of Informatics. Computer Science program (in English).**

Engineering:

- Practical Applications with Arduino (Laboratory).
- Diploma Seminar.
- Project IT System, Semester Theme *Cyber-Physical Systems.*
- Data Science in Business.
- Algorithms and Data Structures.

Master:

- Advanced Cloud Governance.
- Theoretical Basis of Cryptography.
- Innovative technologies - Sensor Networks and Industrie 4.0.
- IT security tests.

2015–2017 (I-sem.) **University of Rzeszów, Faculty of Mathematics and Natural Sciences, Dept. of Mechatronics and Control Engineering. Mechatronics program.**

Engineering:

- Microprocessor Systems I.
- Laboratory of Control Systems.
- Laboratory of Introduction to Automatics.
- Operating Systems and Computer Architecture.

Engineering, specialization **Embedded Systems:**

- Microprocessor Systems II.
- Microcontrollers and FPGA programming.
- Software Engineering.
- Programming Languages and Internet Technology.

Master:

- Visual Programming.
- Microprocessor Engineering.
- Technical English.

2009-2010 **Université Henri Poincaré.** Operations Research: An introduction to optimization, linear programming, and engineering applications. ATER IUTNB-UHP. Nancy, France.

2005-2007 **Universidad de Santiago.** Operations Research: An introduction to optimization, linear programming, and transportation problems. Multicriteria Assesment: An introduction to multicriteria techniques, AHP, DEA, and multi-objective optimization. Laboratory of Control: Continuous dynamical systems modeling and simulation. Santiago, Chile.

Student Supervision

University of Rzeszów: Mechatronics Engineering Diploma Project.

2016–2017 Jarosław Siuzdak. *Design and construction of an ECG data acquisition module for a Raspberry Pi microcomputer.*

2016–2017 Konrad Mierzejewski. *Real-time EMG bio-signal processing using FPGA.*

2016–2017 Maciej Lysoń. *Exploration and mapping robot based on the Raspberry Pi Zero microcomputer using ultrasound sensors.*

2016–2017 Mateusz Łukasik. *Design and construction of an Ethernet card for the computer platform Raspberry Pi Zero.*

Universidad de Santiago de Chile: Industrial Engineering Department.

2009 M. Mazo, Hybrid Metaheuristics: A MBO (Mating Bees Optimization) Approach. Master of Science in Engineering. Thesis Co-Advisor.

2006 C. Aranda, M. Buccioni, Proposal of system implementation of an electronic tributary document generation, Industrial Engineering Diploma Project. Examiner.

2005 M. Ruz, D. Zelaya, Documentation design of the quality management system for ISO 9001 certification in a cosmetic laboratory, Industrial Engineering Diploma Project. Examiner.

2005 S. Osses, Development of a businesses plan for a company of domiciliary services, Industrial Engineering Diploma Project. Examiner.

Courses, Groups, Seminars & Societies

- *Third Annual French Complex Systems Summer School*, (IXXI, ISC-PIF, RNSC). Lyon & Paris, 20/07/2009-14/08/2009.
- *Complex Systems Society, CSS.* Student member. Latino America Committee. 2008- .
- *Summer School on Artificial Evolution*, Assoc. Evolution Artificielle & CNRS. Île de Porquerolles. France, 2008.
- *GdR 717 MACS du CNRS*, Groupement de Recherche en "Modélisation, Analyse et Conduite des Systèmes dynamiques". *GdR 3002 RO du CNRS*, Groupement de Recherche en "Recherche Opérationnelle". France. 2007-2011.
- *School on Information and Randomness*, Mathematical Engineering Dept., Centre for Mathematical Modeling, UMR 2071 UCHILE-CNRS, Universidad de Chile. 2004.
- *Modeling and Simulation Group*, Mathematical Engineering Dept., Universidad de Santiago de Chile. 2004-2005.
- IEEE Seminar: *Borders of the Knowledge in Artificial Neural Networks and Fuzzy Logic*, Electrical Engineering Dept., Universidad de Chile. 2003.
- *Ecological Models and System Theory*, Ecological Modelling Lab., Dept. of Ecology, Universidad de Chile. 2003.

## Publications & Communications
= A. Véjar

Book Chapters

1. . *Mechatronic design considering energetic autonomy: A step towards a smart world*, in L. Leniowska, editor; Wokół Mechatroniki IV. UR KMiA, 2015.

2. P. Palominos, V. Parada, G. Gatica, . *Marriage in Honeybee Optimization to Scheduling Problems*, in J. R. Montoya-Torres, A. A. Juan, L. Huaccho, J. Faulin, G. Rodriguez- Verjan, editors, Hybrid Algorithms for Service, Computing and Manufacturing Systems: Routing, Scheduling and Availability Solutions. IGI Global, 2011.

Journals

1. O. Hyka, , T. Rymarczyk. *Data analysis system for surface potential of biological tissues.* Przegląd Elektrotechniczny, 05/2022.

2. 👤, T. Rymarczyk. *Electrical Tomography Reconstruction Using Reconfigurable Waveforms in a FPGA*. Sensors, 2021.

3. T. Szabała, T. Rymarczyk, 👤. *A robotic respiration phantom with patient data synchronization for medical tomography*. Journal of Physics: Conference Series, 2021.

4. T. Rymarczyk, A. Kosior, P. Tchórzewski, 👤. *Image reconstruction in electrical impedance tomography using a reconfigurable FPGA system*. Journal of Physics: Conference Series, 2021.

5. T. Rymarczyk, 👤. *Waveform-Reconfigurable Emitter Design for Multi Frequency Electrical Tomography*. Przegląd Elektrotechniczny, 2020.

6. T. Rymarczyk, M. Woś, M. Bartosik, 👤, E. Kozłowski, M. Maj, Electrical activity with ECG analysis for Body Surface Potential Mapping. Przegląd Elektrotechniczny, 2020.

7. T. Rymarczyk, P. Nita, 👤, B. Stefaniak, J. Sikora, *Electrical tomography system for Innovative Imaging and Signal Analysis*. Przegląd Elektrotechniczny, 06/2019.

8. T. Rymarczyk, P. Nita, 👤, M. Wos, B. Stefaniak, P. Adamkiewcz. *Wearable mobile measuring device based on electrical tomograpy*. Przegląd Elektrotechniczny, 04/2019.

9. K. Mierzejewski, 👤. *A Platform for Joint Analysis of Biosignal Ensembles on Real-Time using FPGA*. Acta Bio-Optica et Informatica Medica, http://www.inzynieria-biomedyczna.com, 2017.

10. P. Charpentier, 👤. *From Spatio-Temporal Data to Manufacturing System Model: A Data-Knowledge Integration Approach*. Journal of Control, Automation and Electrical Systems, 2014.

11. 👤, P. Charpentier. *Generation of an Adaptive Simulation Driven by Product Trajectories*. Journal of Intelligent Manufacturing, S.I: Intelligent & Distributed Production Control, 2012.

12. P. Palominos, F. Toledo, 👤, M. Alfaro. *Marriage in Honey Bees Optimization Algorithm for Flow-shop Problems*. Informatica Economică Journal, 2012.

Communications

1. O. Hyka, 👤, T. Rymarczyk. *Pseudo Random Binary Sequence Excitation for Electrical Impedance Tomography*. Proceedings of the 19th ACM Conference on Embedded Networked Sensor Systems. 2021.

2. B. Przysucha, T. Rymarczyk, D. Wójcik, 👤. *Improving the Dependability of the ECG Signal for Classification of Heart Diseases*. 50th Annual IEEE-IFIP International Conference on Dependable Systems and Networks-Supplemental Volume (DSN-S). 2020.

3. T. Rymarczyk, 👤. *Multi Frequency Electrical Tomography with Re-configurable Excitation Waveforms*. Applications of Electromagnetics in Modern Engineering and Medicine (Annual conference of the Polish Society of Applied Electromagnetism, PZTE'2019), Janow Podlaski, Poland.

4. M. Woń, T. Rymarczyk, M. Bartosik, 👤, E. Kozłowski, P. Nita. *Combining Body Surface Potential Mapping with ECG Analysis*. Applications of Electromagnetics in Modern Engineering and Medicine (Annual conference of the Polish Society of Applied Electromagnetism, PZTE'2019), Janow Podlaski, Poland.

5. 👤, T. Rymarczyk, P. Paprzycki, *Mutual Information and Delay Embeddings in Polysomnography Studies*. International Interdisciplinary PhD Workshop, IIPhDW'2019, Wismar, Germany.

6. P. Nita, T. Rymarczyk, 👤, B. Stefaniak, M. Wos, A. Stanikowski. *Distributed system for long-term monitoring of cardiopulmonary activity*. International Interdisciplinary PhD Workshop, IIPhDW'2019, Wismar, Germany.

7. T. Rymarczyk, 👤, P. Nita, P. Tchórzewski, J. Sikora. *Electrical Tomography Platform for Innovative Imaging and Biomedical Signals Analysis*. 7th Symposium on Applied Electromagnetics, SAEM'2018, Podčetrtek, Slovenia.

8. T. Rymarczyk, P. Nita, 👤, M. Woś, M. Oleszek, P. Adamkiewicz. *Architecture of a mobile system for the analysis of biomedical signals based on electrical tomography*. Applications of Electromagnetic in Modern Techniques and Medicine (Annual conference of the Polish Society of Applied Electromagnetism, PZTE'2018), Racławice, Poland.

9. 👤, T. Cieplak, T. Rymarczyk. *A distributed infrastructure based on microservices for electrical tomography experiment exploration*. International Interdisciplinary PhD Workshop, IIPhDW'2018, Świnoujście, Poland.

10. 👤, T. Cieplak, T. Rymarczyk. *Cloud computing system for online processing of ERT datastreams*. International Interdisciplinary PhD Workshop, IIPhDW'2018, Świnoujście, Poland.

11. J. Dusek, 👤, T. Rymarczyk, J. Mikulka. *Convergence error exploration for electrical impedance tomography problems with open and closed domains*. International Interdisciplinary PhD Workshop, IIPhDW'2018, Świnoujście, Poland.

12. T. Rymarczyk, 👤, P. Nita, P. Tchórzewski. *Advanced Tomographic Platform for Real-Time Image Reconstruction and Biomedical Signal Analysis*. International Interdisciplinary PhD Workshop, IIPhDW'2018, Świnoujście, Poland.

13. 👤, T. Cieplak, T. Rymarczyk. *Resistor network modeling for discrete tomography image reconstruction*. International Interdisciplinary PhD Workshop, IIPhDW'2018, Świnoujście, Poland.

14. K. Mierzejewski, 👤. *A platform for joint analysis of array biosignals ensembles on real-time using FPGA.* MechMed 2016. Rzeszów, Poland.

15. P. Charpentier, 👤. *A product trajectory-driven model builder for manufacturing systems.* 11th IFAC Workshop on Intelligent Manufacturing Systems, IMS'2013, May 2013, Sao Paulo, Brazil.

16. M. Zanin, 👤. *The emergence of transportation networks.* European Conference on Complex Systems, ECCS09. Satellite Meeting EmergeNET3: Emergence and Networks. 2009. University of Warwick, UK.

17. 👤, I. Gómez-Castaño. *Reparation as an emergent process in metabolic networks.* European Conference on Complex Systems, ECCS09. Satellite Meeting EmergeNET3: Emergence and Networks. 2009. University of Warwick, UK.

18. P. Palominos, 👤, F. Toledo. *Marriage in Honey Bees Optimization Algorithm for Flow-Shop Problems : Changing the Space of Mating-Flight.* 20th International Conference on Production Research (ICPR'20), 2009. Shanghai, China.

19. 👤, P. Charpentier. *Simulation code generation using product location information.* 13th IFAC Symposium on Information Control Problems in Manufacturing (INCOM'09), 2009. Moscow, Russia.

20. 👤, F. Chaxel, J.-Y. Bron, P. Charpentier. *Génération automatique de modèle de simulation par les données de localisation des produits.* 6ème Conférence Internationale Conception & Production Intégrées (CPI'09), 2009. Fès, Morocco.

21. 👤, P. Charpentier. *Information de localisation du produit pour la génération de code de simulation.* 8ème Congrès International de Génie Industriel (CIGI'09), 2009. Bagnères de Bigorre, Tarbes, France.

22. 👤, P. Charpentier. *Construction d'un modèle de simulation par le biais de données de localisation des produits.* 10ème Conférence de la Société Française de Recherche Opérationelle et d'Aide à la Décision (ROADEF'09), 2009. Nancy, France.

23. 👤, P. Charpentier. *Générateur de code de simulation à partir de l'information de localisation du produit.* 3èmes Journées Doctorales / Journées Nationales du GdR MACS (JD-JN-MACS), 2009. Angers, France.

24. P. Palominos, J. Guzmán, 👤. *MBO Metaheuristic applied to Flow Shop Scheduling Problem.* VII Chilean Congress of Operations Research (OPTIMA), 2007. Puerto Montt, Chile.

25. 👤, C. Herrera. *Quantification of positive relations in a organizations by network synergism.* XIII Latin Iberoamerican Congress of Operations Research (CLAIO), 2006. Montevideo, Uruguay.

26. 👤, M. Alfaro, J. Soto. *Finding Improvements in MIMO Wireless Communications Systems Design using Scenery Reconstruction Decodification.* 10th WSEAS Int.Conf. on SYSTEMS, 2006, Vouliagmeni Beach, Athens, Greece.

Other Interests

Outdoors & adventure: trekking, running, biking, swimming. Iyengar yoga. Reading. Traveling. Music: metal, post-rock, psychedelic space rock, jazz, classic, folk. Sci-Fi and Cyberpunk. Gardening, drawing, DIY.

Languages

Proficiency from left to right: Spanish (Native), English, French, Polish (Beginner).

September 9, 2022. Lublin, Poland.