Paulin Jacquot, PhD

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Since January 2021, I started as research engineer at EDF Lab Saclay (OSIRIS department). In 2020 I was a Mitacs postdoctoral fellow researcher at the GERAD center and Polytechnique Montréal university. I defended my PhD at École polytechnique on Dec 5, 2019. My work focuses on distributed optimization and game theory algorithms, multi-agents systems, learning and applications to smart grid and the management of electric systems in general.

Work Experience

Jan. 2021- present

***Research Engineer*, EDF Lab, Palaiseau, France**
Started a research engineer position, working in the departement of *Optimization, Simulations, Risks and Statistics* (OSIRIS), in the team focused on Energy markets and Risks.

Feb. 2020-Dec. 2020

***Postdoctoral Researcher*, GERAD, Polytechnique Montréal, Montréal, Canada**
Postdoctoral research position (*Mitacs* fellowship), working on distributed and decentralized optimization methods and applications to electricity consumption flexibilities and network constraints, in partnership with Hydro-Québec research institute (IREQ).

Sep. 2016-Jan. 2020

***PhD Researcher*, EDF R&D and École polytechnique, Paris, France**
"*Game theory and optimization methods for decentralized electric systems*". Supervised by S. Gaubert (Inria, CMAP), N. Oudjane (EDF R&D) and O. Beaude (EDF R&D) Patent on a non-intrusive method to manage flexibilities. Several publications and communications.

Mar. 2016-Aug. 2016

***Artelys*, Paris, France**
Scientific consulting in optimization, specialized in energy. Worked on stochastic optimization projects, use of AMPL, Python, optimization solvers XPRESS and Knitro. Winner of nonlinear optimization challenge MINO using solver Knitro.

Mar. 2015-Aug. 2015

***University of California*, Davis, United States**
Multi-stage stochastic optimization for Unit Commmitment, supervised by Pr. David L. Woodruff and Pr. Roger J.B. Wets. Development of a new model, algorithm and scenarios for optimizing dispatch of electricity production. Use of Python, Pyomo, solver GUROBI.

Jul. 2014-Aug. 2014

***Safran MBD*, Suzhou, China**
Engineering internship on a green-belt project, standardizing production programs of some parts of landing gears of aircrafts.

Education

2016-2020

***PhD in applied mathematics*, École polytechnique, Université Paris-Saclay, Paris, France**
"*Game theory and optimization methods for decentralized electric systems*".

2015-2016

***M.Sc. in Operations Research (MPRO). Université Paris-Saclay, CNAM*, Paris, France**
Leading program in France in operations research and combinatorial optimization (mathematical programming, graph theory, complexity, heuristics).

2012-2016

***Cycle ingénieur polytechnicien (M.Sc.). École polytechnique*, Paris, France**
Graduate program in France's leading engineering school, majors in applied maths and computer science. Lead a language-processing student project in partnership with IBM.

2009-2012

***CPGE. Lycée Henri Poincaré*, Nancy, France**
Undergraduate program in advanced Mathematics and Physics to prepare the national competitive exams for the entrance in French *grandes écoles*.

2006-2009

***Baccalauréat scientifique. Lycée Jules Ferry*, Saint-Dié, France**
French secondary Diploma, awarded with very high honors.

Computer Skills

Development: Python (expert), C++, JAVA and AMPL and GAMS experiences.
Optimization tools and solvers: CvxOpt, Pyomo, CPLEX, Gurobi, XPRESS, Knitro, Ipopt, Couenne.
Others: GIT subversion control, Linux environment, HTML & CSS.

Languages

French (first language), English (fluent), Spanish (basic skills), German (basic skills), Chinese (basic skills).

PUBLICATIONS

Patents

[1] Paulin Jacquot, Nadia Oudjane, Olivier Beaude, Pascal Benchimol, and Stéphane Gaubert. "Procédé de gestion décentralisée de consommation électrique non-intrusif". French Patent FR1872553. EDF and Inria. 2018. filed to INPI on 7 Dec. 2018.

[2] Bayram Kaddour, Olivier Beaude, Paulin Jacquot, and Pascal Benchimol. "Procédé de désagrégation d'une courbe de charge électrique". French Patent FR19****. EDF. 2019. filed to INPI in 2019.

Journal Papers

[1] Paulin Jacquot, Olivier Beaude, Pascal Benchimol, Stéphane Gaubert, and Nadia Oudjane. "A Privacy-preserving Method to optimize distributed resource allocation". In: *SIAM Journal on Optimization* 30.3 (2019), pp. 2303–2336. arXiv: 1908.03080.

[2] Paulin Jacquot, Olivier Beaude, Stéphane Gaubert, and Nadia Oudjane. "Analysis and Implementation of an Hourly Billing Mechanism for Demand Response Management". In: *IEEE Transactions on Smart Grid* 10.4 (July 2019), pp. 4265–4278. ISSN: 1949-3053. DOI: 10.1109/TSG.2018.2855041. arXiv: 1712.08622.

[3] Paulin Jacquot, Cheng Wan, Olivier Beaude, and Nadia Oudjane. "Efficient Estimation of Equilibria in Large Aggregative Games with Coupling Constraints". In: *IEEE Transactions on Automatic Control* Early Access (2019). arXiv: 1911.10571.

[4] Hélène Le Cadre, Paulin Jacquot, Cheng Wan, and Clémence Alasseur. "Peer-to-Peer Electricity Market Analysis: From Variational to Generalized Nash Equilibrium". In: *European Journal of Operational Research* 282.2 (2020), pp. 753–771. DOI: 10.1016/j.ejor.2019.09.035. arXiv: 1812.02301.

Preprints

[5] Paulin Jacquot. "DLMP-based Coordination Procedure for Decentralized Demand Response under Distribution Network Constraints". In: *arXiv preprint* (2020). arXiv: 2004.06004.

[6] Paulin Jacquot and Cheng Wan. "Nonatomic Aggregative Games with Infinitely Many Types". In: *arXiv preprint* (2019). arXiv: 1906.01986.

Proceedings

[7] Paulin Jacquot and Cheng Wan. "Routing Game on Parallel Networks: the Convergence of Atomic to Nonatomic". In: *IEEE 57th Conference on Decision and Control (CDC)*. IEEE. 2018. arXiv: 1804.03081.

[8] Paulin Jacquot, Olivier Beaude, Pascal Benchimol, Stéphane Gaubert, and Nadia Oudjane. "A Privacy-preserving Disaggregation Algorithm for Non-intrusive Management of Flexible Energy". In: *IEEE 58th Conference on Decision and Control (CDC)*. IEEE. 2019. arXiv: 1903.03053.

[9] Paulin Jacquot, Olivier Beaude, Stéphane Gaubert, and Nadia Oudjane. "Demand Response in the Smart Grid: the Impact of Consumers Temporal Preferences". In: *IEEE International Conference on Smart Grid Communications (SmartGridComm)*. 2017. arXiv: 1711.11304.

[10] Paulin Jacquot, Olivier Beaude, Stéphane Gaubert, and Nadia Oudjane. "Demand Side Management in the Smart Grid: an Efficiency and Fairness Tradeoff". In: *IEEE/PES 8thInnovative Smart Grid Technologies Europe (ISGT)*. IEEE. 2017. arXiv: 1711.11129.

DISTINCTIONS & AWARDS

- AMIES (French association for Maths and Industry) PhD 2020 prize;
- Paul Caseau 2020 PhD prize;
- Mitacs Postdoctoral Fellowship (2020);
- *Cifre* PhD scholarship (2017-2019);
- top of class in M.Sc. MPRO out of 33 students, class of 2016;
- winner of *nonlinear optimization* challenge MINO (2016);

ORGANIZATION AND LEADERSHIP

- delegate of PhD students of EDF OSIRIS department, organizer of the PhD seminar at EDF Lab Saclay;
- co-organizer of a session *"Congestion games"* at the conference PGMO days 2018;
- organizer of the *"Workshop on Network, population and congestion games"* (NPCG19) in April, 2019.

TEACHING

Oct. 2016-Dec. 2017	***Université Paris II Panthéon-Assas*, Paris France** Teaching assistant in Game theory for undergraduate students majoring in economics.
Sept. 2014-Jun. 2017	***Lycée Hoche*, Versailles, France** Examiner in Mathematics for undergraduate students in advanced mathematics programs.
Sept. 2013-Jun. 2015	***Optimal Prépa*, Paris, France** Math courses and tutoring to advanced undergraduate students in *CPGE* programs.

COMMUNICATIONS

[1] *A Game-theoretic Model for Demand Response: Analysis, Implementation and Challenges.* UK center - EDF Lab Seminar. (EDF Lab, Saclay, France, Jan. 6, 2018).

[2] *A Privacy-preserving Disaggregation Algorithm based on Alternate Projections Method for Non-intrusive Management of Flexible Energy.* ECal group seminar. (UC Berkeley, California, Mar. 11, 2019).

[3] *A Privacy-preserving Disaggregation Algorithm based on Alternate Projections Method for Non-intrusive Management of Flexible Energy.* Netlab seminar (also given at ECal seminar, UC Berkeley). (Caltech, California, Mar. 22, 2019).

[4] *A Privacy-preserving Disaggregation Algorithm for Non-intrusive Management of Flexible Energy.* IEEE 58th Conference on Decision and Control. (Nice, France, Dec. 13, 2019).

[5] *A Privacy-Preserving Disaggregation Algorithm for Nonconvex Optimization based on Alternate Projections.* French-German-Swiss Conference on Optimization (FGS). (Nice, France, Sept. 18, 2019).

[6] *A Privacy-preserving Method to Optimize Distributed Resource Allocation.* Journée de rentrée du CMAP (Invited). (École polytechnique, France, Oct. 7, 2019).

[7] *A solution to the pooling problem of the MINO challenge.* MINO European Project Meeting (invited as winner of the challenge). (Bologna, Italy, Oct. 10, 2016).

[8] *An Efficient Algorithm for the Pooling Problem.* ROADEF. (Metz, France, Feb. 22, 2017).

[9] *Analysis of a Routing Game Model for Demand Side Management.* International Symposium on Mathematical Programming. (Bordeaux, France, July 4, 2018).

[10] *Demand Response and Dynamic Pricing in the Smart Grid: Efficiency, Fairness and Robustness.* Séminaire Tarification. (EDF Lab Saclay, France, June 29, 2017).

[11] *Demand Response: Congestion in the Electricity Network.* CIGNE2017 Summer School on Network Theory. (Roscoff, France, June 23, 2017).

[12] *Demand Response in the Smart Grid: the Impact of Consumers Temporal Preferences.* IEEE SmartGridComm'17. (Dresden, Germany, Oct. 26, 2017).

[13] *Demand Response Management for Energy Consumption Flexibilities: from Decentralized Optimization to Games.* Group Seminar. (GERAD research center, Montréal, Canada, Feb. 20, 2020).

[14] *Demand Side Management in the Smart Grid: an Efficiency and Fairness Tradeoff.* IEEE Innovative Smart Grid Technologies Europe. (Torino, Italy, Sept. 28, 2017).

[15] *Efficiency of Game-Theoretic Energy Consumption in the Smart Grid.* Paris Game Theory Ph.D. Seminar. (IHP Paris, France, Mar. 27, 2017).

[16] *Efficiency of Game-Theoretic Energy Consumption in the Smart Grid.* Spain-Italy-Netherlands Meeting on Game Theory (SING13). (Paris, France, July 6, 2017).

[17] *Exploiting consumers flexibilities via a Demand Response mechanism: Decentralized Nash Computation.* Réseau Optimisation. (EDF Lab Saclay, France, June 30, 2017).

[18] *Fast Computation of Equilibria in Splittable Routing Games: Application to Electricity Demand Response. (POSTER).* Journées SMAI-MODE. (Autrans, France, Mar. 28, 2018).

[19] *Game theory and optimization methods for decentralized electric systems.* PhD Defense. (École polytechnique, Palaiseau, France, Dec. 5, 2019).

[20] *Nonatomic Aggregative Games with Infinitely Many Types.* Game Theory Seminar. (Insitut Henri Poincaré, Paris, France, Oct. 14, 2019).

[21] *Optimizing Electricity Consumers Flexibilities in the Smart Grid: A Game Theoretic Model.* Seminar Optimization and Equilibrium. (CMM, Santiago, Chile, May 16, 2018).

[22] *Peer-to-Peer Electricity Market Analysis: From Variational to Generalized Nash Equilibrium.* PGMO Days. (EDF Saclay, France, Dec. 4, 2019).

[23] *Splittable Routing Congestion Games: Convergence of n-players Instances to a Nonatomic Instance .* PGMO Days'17. (EDF Lab Saclay, France, Nov. 14, 2017).

[24] *Efficient Estimation of Equilibria of Large Congestion Games with Heterogenous Players (POSTER).* CAESARS Advances in Modelling and Control for Power Systems of the Future. (EDF Lab Saclay, France, Sept. 6, 2018).

[25] *Routing Game on Parallel Networks: the Convergence of Atomic to Nonatomic.* 2018 IEEE Conference on Decision and Control (CDC). (Miami Beach, Florida, Dec. 18, 2018).