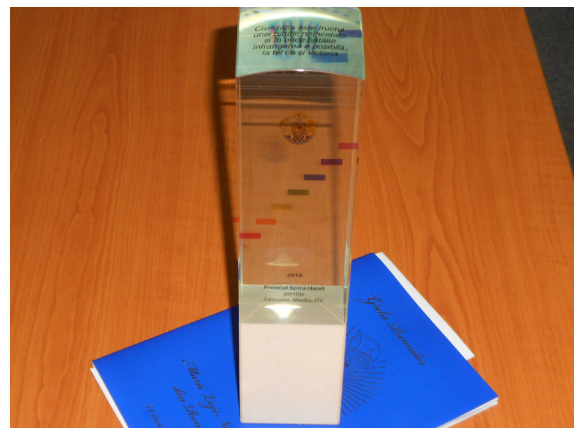


National Grand Lodge of Romania & Romanian Academy 2016 “Spiru Haret” Award for Education, Environment and IT Prof. Radu-Emil PRECUP, PhD & Lect. Mircea-Bogdan RĂDAC, PhD

The Spiru Haret Award from the National Grand Lodge of Romania in partnership with the Romanian Academy for education, environment and IT has been awarded to Lect. Dr. Mircea-Bogdan RĂDAC and Prof. Radu-Emil PRECUP, with the Department of Automation and Applied Informatics, for the following group of papers published in 2015 and generically called Contributions to Model-Free Data-Driven Control:

- M.-B. Rădac, R.-E. Precup, Data-based two-degree-of-freedom iterative control approach to constrained non-linear systems, IET Control Theory & Applications, vol. 9, no. 7, pp. 1000-1010, 2015, impact factor = 2.048.
- M.-B. Rădac, R.-E. Precup, Optimal behaviour prediction using a primitive-based data-driven model-free iterative learning control approach, Computers in Industry, vol. 74, pp. 95-109, 2015, impact factor = 1.957.
- M.-B. Rădac, R.-E. Precup, E. M. Petriu, Model-free primitive-based iterative learning control approach to trajectory tracking of MIMO systems with experimental validation, IEEE Transactions on Neural Networks and Learning Systems, vol. 26, no. 11, pp. 2925-2938, 2015, impact factor = 4.854.
- M.-B. Rădac, R.-E. Precup, E. M. Petriu, Constrained data-driven model-free ilc-based reference input tuning algorithm, Acta Polytechnica Hungarica, vol. 12, no. 1, pp. 137-160, 2015, impact factor = 0.544.
- R.-C. Roman, M.-B. Rădac, R.-E. Precup, E. M. Petriu, Data-driven optimal model-free control of twin rotor aerodynamic systems, Proceedings of 2015 IEEE International Conference on Industrial Technology ICIT 2015, Seville, Spain, pp. 161-166, 2015.

This group of papers proposes learning approaches for automatic control systems in order to endow them with intelligent features such as learning, prediction and hierarchical control capabilities, which are specific to living organisms. This attempt should lead towards higher degrees of autonomy and adaptability in feedback control systems, enabling them able to deal with uncertainty, environment operational constraints, nonlinearities, scalability, large number of design variables. The research fits well within current



trends in control and artificial intelligence research topics such as autonomous self-driving vehicles, robots and unmanned aerial vehicles. The underlying idea borrows the ability of living organisms to learn, accumulate learning experience and extrapolate it optimally in new situations never seen before, while never explicitly solving mathematical equations for that, using the biological brain as a hierarchical high-level controller that coordinates the low level controllers. This has lead and motivated the development of the model-free data-driven techniques proposed by the authors.