Computer Mathematics and Mathematical Modeling Department

NTU «KhPI»

PROPOSALS FOR COOPERATION

Department of Computer Mathematics and Mathematical Modeling

Head of the Department Leonid Lyubchyk Dr. Sc., professor

Off +38 057 707 63 51

Cell +38 097 984 04 39

Fax +38 057 707 66 01

e-mail off: lyubchyk@kpi.kharkiv.edu

e-mail home: lyubchik.leonid@gmail.com

lyubchyk.leonid@ukr.net

We provide education programs for Bachelors and Masters Degrees in:

1) Applied Mathematics

2) Data Mining

Subjects of research

I. Nonlinear dynamic systems robust control based on inverse models method

II. Managing complex supply chains under demand uncertainty

III. Internet Data Mining based on machine learning approaches

Participation in projects

I. Development of methods for solving inverse problems of nonlinear systems diagnostics and control using synergetic and computational intellect approaches.

II. Creation of information technology for national projects portfolio formation based on simulation model of scientific and technological development of Ukraine.

III. Cooperation with «Samsung Electronics Ukraine Company» LTD (SEUC) on «Semi-supervised clusterization of large corps of short texts» and «Semi-supervised machine learning algorithms» projects.

IV. Cooperation with «Kharkiv IT-Cluster» companies to implement the concept of dual IT-education. All students in the department receive in-depth training with INSART and/or Cloud Works LTD companies.

List of selected publication
(Signal and data processing)

1. Lyubchyk L.M., Grinberg G.L. Blind Deconvolution and Separation Signal Processing via Inverse Model Approach. Proc. of IEEE International Workshop on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications. 6-8 September 2007, Dortmund, Germany. 2007.
2. Lyubchyk L.M., Kolbasin V. A. Kernel-Based Methods for Non-Stationary Time-Series Identification and Prediction. Intelligent Information and Engineering Systems: International Book Series “Information Science and Computing”, Vol. 3, No. 13, 2009. - Pp. 42-48. http://foibg.com/ibs_isc/ibs-13/ibs-13-p05.pdf
3. Lyubchyk L.M. Optimal data fusion in decentralized stochastic unknown input observers // Proc. of IEEE 7th International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS’2013), Berlin, Germany, 2013, pp. 358-362. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6662706&queryText%3Dlyubchyk
4. Lyubchyk L.M. Optimal Information Fusion in Stochastic Unknown Input Observer Network. In V. Haasz and K. Madani (Eds.), Advanced Data Acquisition and Intelligent Data Processing, River Publishers, Denmark. 2014. Pp. 127–158. http://riverpublishers.com/view_details.php?book_id=229

List of selected publication (Control theory)

5. Lyubchyk L.M. Disturbance Rejection in Linear Discrete Multivariable Systems: Inverse Model Approach // Proc. of 18-th IFAC World Congress, Milan, Italy, August 28 - September 2, 2011, 6 p. http://www.ifac-papersonline.net/Detailed/50087.html
6. Lyubchyk L.M. Output Tracking and Mismatched Disturbances Rejection Using Inverse Model Based Equivalent Sliding Mode Control. Proc. of 8th IEEE Intern. Conference on Electrical Engineering, Computing Science and Automatic Control, Merida - Yucatan, Mexico, October 26-28, 2011, 6 p. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6106700&queryText%3Dlyubchyk
7. Lyubchyk L.M., Dorofieiev Y. I., Nikulchenko A. A. Robust Model Predictive Control of Constrained Supply Networks Via Invariant Ellipsoids Technique. Proc. of 7th IFAC Conference on Manufacturing Modeling and Control (MIM'2013), St. Petersburg, Russia, June 19-21, 2013, 6 p.
8. Yu. I. Dorofieiev, L. M. Lyubchyk, A. A. Nikulchenko. Robust stabilizing inventory control in supply networks under uncertainty of external demand and supply time-delays. Journal of Computer and Systems Sciences International, 2014, Vol. 53, Issue 5, pp 761-775. http://link.springer.com/article/10.1134/S1064230714050062
9. L. M. Lyubchyk, O. V.Kostyuk. Selective Invariant Multivariable Control Sestem Design based on Inverse Model Approach. International Collection of Scientific Proceedings «European Cooperation» Vol 1, No 1, 2015, pp. 95-105. http://we.clmconsulting.pl/index.php/we/article/view/16

List of selected publication (Machine learning)

10. Lyubchyk L.M., Soloshchuk V.M. Software Development Process Dynamics Modeling as State Machine. Methods and Instruments of Artificial Intelligence: International Book Series “Information Science and Computing”, Book 20, 2010, Pp. 67 - 74. http://www.foibg.com/ibs_isc/ibs-20/ibs-20-p05.pdf

11. Lyubchyk L.M., Grinberg G.L. Preference Function Reconstruction for multiple Criteria Decision Making Based on Machine Learning Approach. In L.A. Zadeh et al. (eds), Recent Developments and New Directions in Soft Computing. Springer, Switzerland. 2014. Pp. 53-63. http://www.springer.com/engineering/computational+intelligence+and+complexity/book/978-3-31906322-5

12. Lyubchyk L.M., Kolbasin V.A., Shafeev R.A. Nonlinear Signal Reconstruction based on Recursive Moving Window Kernel Method. 8-th International Conference on Intelligent Data Acquisition and Advanced Computing Systems (IDAACS’2015), Warsaw, Poland, 2015, 6 p. http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=7340677

Proposals for joint research

I. Development of methods of complex systems control under uncertain disturbances

II. Development of estimation and control methods for multi-agent network systems

III. Development of machine-learning-based methods of expert preferences modeling in multi-criteria decision making problems

IV. Development of time series analysis and prediction methods based on computational intellect approaches