LISTA LUCRĂRILOR ŞTIINŢIFICE

Numele şi prenumele: BAKÓ László

A. Teza de doctorat.

Universitatea Transilvania din Braşov,
Facultatea de Inginerie Electrică şi Ştiinţa Calculatoarelor,
Domeniul fundamental: Ştiinţe Inginereşti,
Domeniul: Inginerie Electronică şi Telecomunicaţii,
Titlul tezei de doctorat: "Sisteme Adaptive cu Reţele Neuronale Artificiale Neuromorfe. Realizări cu Dispozitive Hardware Reconfigurabile",
Conducător ştiinţific: Prof. dr. ing. Iuliu SZÉKELY

B. Lista lucrări ştiinţifice publicate

B1. Lucrări ştiinţifice publicate în reviste cotate ISI

1. **Bakó László**, *Real-time classification of datasets with hardware embedded neuromorphic neural networks,* Briefings in Bioinformatics, Special Issue: Parallel and Ubiquitous Methods and Tools in Systems Biology: May 2010; Vol. 11, No. 3,p348-363, doi: 10.1093/bib/bbp066, Oxford University Press (**Impact Factor: 9.283**)
   - *Cit. 1. Wang, Pu; Weise, Thomas; Chiong, Raymond, Novel evolutionary algorithms for supervised classification problems: an experimental study, Evolutionary Intelligence, 2011, Springer Berlin / Heidelberg, ISSN 1864-5909*
   - *Cit. 2. Cawley, Seamus; Morgan, Fearghal; McGinley, Brian; Pande, Sandeep; McDaid, Liam; Harkin, Jim; , "The impact of neural model resolution on hardware Spiking Neural Network behaviour," Signals and Systems Conference (ISSC 2010), IET Irish , vol., no., pp.216-221, 23-24 June 2010*
   - *Cit. 3. Cawley, Seamus; Morgan, Fearghal; Mcginley, Brian; Pande, Sandeep; Mcdaid, Liam; Carrillo, Snaider and Harkin, Jim. 2011. Hardware spiking neural network prototyping and application. Genetic Programming and Evolvable Machines 12, 3 (September 2011), 257-280. DOI=10.1007/s10710-011-9130-9 http://dx.doi.org/10.1007/s10710-011-9130-9*
   - *Cit. 4. Mohemmed, Ammar; Schlieb, Stefan; Matsuda, Satoshi; Nikola Kasabo. SPAN: Spike Pattern Association Neuron for Learning Spatio-Temporal Sequences, International Journal of Neural Systems, (August, 2011)*
   - *Cit. 5. Jing, Gu; Liu, Lu-yang; Yu, Xiao-yang. The Reasearch of Multivariable Fuzzy Neural Network Controller based on FPGA, Journal of Harbin University of Science and Technology, Vol 16. No. 2., Aprli 2011, China.*

B2. Lucrări ştiinţifice publicate în reviste indexate în baze de date internaţionale

1. **Bakó L**., Brassai, S.T., " Embedded neural controllers based on spiking neuron models,", Pollack Periodica , An International Journal for Engineering and Information Sciences, DOI: 10.1556/Pollack.4.2009.3.13, Vol. 4, No. 3, pp. 143–154 (December 2009), Akadémiai Kiadó, Budapest, Hungary, ISSN 1788-3911, SJR — SCImago Journal & Country Rank: 0,031.
2. Brassai, S.T., **Bakó L**., "Visual Trajectory Control of a Mobile Robot Using FPGA Implemented Neural Network", Pollack Periodica, An International Journal for Engineering and Information Sciences, Pollack.4.2009.3.12, Vol. 4, No. 3, pp. 129–142 (December 2009),

Akadémiai Kiadó, Budapest, Hungary, ISSN 1788-3911, SJR — SCImago Journal & Country Rank: 0,031.

3. **Bakó László**, Brassai Sándor Tihamér, Spiking neural networks built into FPGAs: Fully parallel implementations,WSEAS Transactions on Circuits and Systems, Issue 3, Volume 5, March 2006, pp346-353, ISSN 1109-2734, British Library Direct, SJR — SCImago Journal & Country Rank: 0,033.
   - *Cit. 6. Yutaka Maeda, Yoshinori Fukuda, and Takashi Matsuoka. 2008. Pulse density recurrent neural network systems with learning capability using FPGA.* WSEAS Trans. Cir. and Sys. *7, 5 (May 2008), 321-330.*
4. Brassai Sándor Tihamér, **Bakó László,** Hardware Implementation of CMAC Type Neural Network on FPGA for Command Surface Approximation, Acta Polytechnica Hungarica - Journal of Applied Sciences at Budapest Tech Hungary, Vol. 4, No. 3, 2007, pp. 5-16, ISSN 17858860, MATARKA, IEEE.
   - *Cit. 7. Min-Kuang Wu; Widodo, S., Single input cerebellar model articulation controller (CMAC) based maximum power point tracking for photovoltaic system, Computer Communication Control and Automation (3CA), 2010 International Symposium on, ISBN: 978-1-4244-5565-2, pp. 439 – 442*
   - *Cit. 8. Slamet Widodo, Microcontroller Implementation of Low-Cost Maximum Power Point Tracking Methods for Photovoltaic System, 2009, Master's Thesis, Southern Taiwan University, Department of Mechanical Engineering.*
   - *Cit. 9. S.P. Joy Vasantha Rani, K. Aruna Prabha, (2010) "Stochastic logic computation based RBFNN with adaptive hidden layer structure", Journal of Engineering, Design and Technology, Vol. 8 Iss: 2, pp.206 – 220.*
   - *Cit. 10. Mehran S. Razzaghi, Alireza Mohebbi. Predicting the Seismic Performance of Cylindrical Steel Tanks Using Artificial Neural Networks (ANN)., Acta Polytechnica Hungarica, Vol. 8, No. 2, 2011.*
   - *Cit. 11. A. Taghavipour, M.S. Foumani, M. Boroushaki, Implementation of an optimal control strategy for a hydraulic hybrid vehicle using CMAC and RBF networks, Scientia Iranica, Available online 13 March 2012, ISSN 1026-3098, 10.1016/j.scient.2012.02.019.*
5. S. T. Brassai, **L. Bakó**, L. Losonczi Assistive Technologies for Visually Impaired People, Acta Universitatis Sapientiae, Electrical and Mechanical Engineering, 3 (2011) pp. 39−50 (EBSCO databases).

B3. Lucrări ştiinţifice publicate în reviste din străinătate (altele decât cele menţionate anterior).

1. **Bakó L**., Székely I (2009). *Challenges for implementations of delay-coded neuromorphic neural networks on embedded digital hardware*. Frontiers in Neuroinformatics. Conference Abstract: 2nd INCF Congress of Neuroinformatics. DOI:10.3389/conf.neuro. 11.2009.08.050, http://frontiersin.org/neuroinformatics/

B4. Lucrări ştiinţifice publicate în reviste din ţară, recunoscute CNCSIS (altele decât cele din baze de date internaţionale).

1. **Bakó László**, Székely Gyula (Iuliu), Brassai Sándor Tihamér, *Development of Advanced Neural Models. Software And Hardware Implementation*, Timişoara, Transaction on Electronics and communication, Scientific buletin of the „Politehnica" University of Timişoara, 2004, p214-219, ISSN 15833380 **(Cat. B+)**
2. Brassai Sándor Tihamér, Dávid László, **Bakó László**, *Hardware Implementation of CMAC based artificial network with process control application*, Timişoara, Transaction on Electronics and communication, Scientific buletin of the „Politehnica" University of Timisoara, 2004, p209-213, ISSN 1583-3380 **(Cat. B+)**

B5. Lucrări ştiinţifice publicate în volumele manifestărilor ştiinţifice

1. **Bakó László**, Iuliu Székely, Dávid László, Brassai Sándor Tihamér, *Simulation of Spiking Neural Networks*, Proceedings of the 9th International Conference on Optimisation of Electrical and Electronic Equipment (OPTIM ’04), ISBN 973-635-285-4, pp179-184, Trasilvania University Press, Braşov, 2004, **ISI proceedigs.**
2. **Bakó László**, Brassai Sándor Tihamér, *Fejlett neuronmodellek szimulációja és megvalósítása*, Számokt 2004 – Cluj-Napoca, EMT, 2004, ISBN:973-86097-8-X, p98-107
3. **Bakó László**, Brassai Sándor Tihamér, *Természetazonos felépítésűmesterséges neurális hálózatok hardvare megvalósítása*, Cluj-Napoca, Számokt 2005 Kolozsvár, EMT, P219-230, ISBN: 973-7840-01-1
4. **Bakó László**, Brassai Sándor Tihamér, Iuliu Székely, *Fully Parallel Implementation of Spiking Neural Networks on FPGA*, Proceedings of the 10th International Conference on Optimisation of Electrical and Electronic Equipment (OPTIM ’06), Braşov (Moeciu), Volume III, pp135-142, ISBN 973-635-705-8, Trasilvania University Press, 2006, **ISI proceedigs.**
5. **Bakó László**, Brassai Sándor Tihamér, *Hardware spiking neural networks: parallel implementations using FPGAs,* Proceedings of the 8th WSEAS Int. Conference on Automatic Control, Modeling and Simulation, Prague, Czech Republic, March 12-14, 2006 (pp261-266), ISBN 960-8457-42-4, ISSN 1790-5117
   Cit. 12. W. J. Han, S. D. Kim, I. S. Han, Bio-inspired visual information processing – the neuromorphic approach, WSEAS Transactions on Circuits and Systems, 2010
6. Brassai Sándor Tihamér, **Bakó László**, Dan Ştefan, FPGA *Parallel Implementation of CMAC Type Neural Network with on Chip Learning*, SACI 2007, Budapest Tech, Hungary, 2007, 111-115, ISBN: 142441234X, **ISI proceedigs**.
   Cit. 13. Sheng Rong-ju, Ma Jianwei: FPGA Hardware Implementation of Artificial Neural Network Research Progress, Electrical Automation Journal, 2009. No. 5, Shanghai Association of Automation - Shanghai Design Institute of Electric Automation, China, Editor: Huang Jian-Min, ISSN 1000-3886, pp53-54.
7. **Bakó, L**., Brassai, S.T., Székely, I., Baczó, M., *Hardware Implementation of Delay-coded Spiking-RBF Neural Network for Unsupervised Clustering*, Proceedings of the 11th International Conference on Optimisation of Electrical and Electronic Equipment (OPTIM’08), ISBN9789731310329, pp51-56, Transilvania Univ. of Brasov, 2008, Brasov, **ISI proceedigs**.
   Cit. 14. Evangelos Stromatias, Developing a supervised training algorithm for limited precision feed-forward spiking neural networks, 107 pages, MSc thesis Microelectronic Systems, 2011, University of Liverpool, supervised by John Marsland
8. Brassai, S.T., **Bakó, L**., Pana, G., Dan, Şt., ”*Neural Control Based on RBF Network implemented on FPGA*” Proceedings of the 11th International Conference on Optimisation of Electrical and Electronic Equipment (OPTIM ’08) , ISBN 978-973-131-032-9, pp41-46, Transilvania University of Brasov, Braşov, 2008, **ISI proceedigs**.
   Cit. 15. Xiaoping Zhu; Longtao Yuan; Dong Wang; Yaowu Chen; , "FPGA Implementation of a Probabilistic Neural Network for Spike Sorting", Information Engineering and Computer Science (ICIECS), 2010 2nd International Conference on, vol., no., pp.1-4, 25-26 Dec. 2010, doi: 10.1109/ICIECS.2010.5677694
9. Brassai, S. T., L. Márton, L. Dávid, **L. Bakó**, “*Hardware implemented neural network based mobile robot control*”, Proceedings of the International Symposium for Design and Technology of Electronic Packages, Faculty Of Electrical Engineering And Computer Science, Department Of Electronics And Computers, "Transilvania" University Of Brasov and Center For Technological Electronics And Interconnection Techniques "Politehnica" University Bucharest, SIITME 2008, Predeal, Romania.
10. Brassai, S. T., Gidró L., **L. Bakó**, G. Csernath, “*Practical Implementation of an Embedded Intelligent Control System*”, Proceedings of the International Symposium for Design and

Technology of Electronic Packages, Faculty Of Electrical Engineering And Computer Science, Department Of Electronics And Computers, "Transilvania" University Of Brasov and Center For Technological Electronics And Interconnection Techniques "Politehnica" University Bucharest, SIITME 2008, Predeal, Romania

11. Brassai S. T., **L. Bakó, "***Mobilis robot mesterséges idegsejt hálóval való szabályzása pályakövetési feladatokra*", Enelko-SzámOkt 2008, Sumuleu-Ciuc, EMT Cluj-Napoca, 2008, ISSN: 1842-4546, p116-121
12. **Bakó, L.,** Brassai, S.T., „*Embedded neural controllers based on spiking neuron models*", Fourth International PhD, DLA Symposium, University of Pécs, Hungary, Pollack Mihály Faculty of Engineering, 20-21 October, 2008, Edited by Prof. Miklós Iványi, ISBN 978-963-7298-27-1, Rotari Press, Komló, Hungary.
13. Brassai, S.T., **Bakó, L., „**V*isual trajectory control of a mobile robot using FPGA implemented neural network*", Fourth International PhD, DLA Symposium, University of Pécs, Hungary, Pollack Mihály Faculty of Engineering, 20-21 October, 2008, Edited by Prof. Miklós Iványi, ISBN 978-963-7298-27-1, Rotari Press, Komló, Hungary.
14. **Bakó, L, „***Partially Serialized Computation in Networks of Pulse-based Artificial Neurons*", 1st International Conference on Recent Achievements in Mechatronics, Automation, Computer Science and Robotics, MACRo 2009, Sapientia University, Department Of Electrical Engineering, Department Of Mechanical Engineering, March 20-21, 2009, Tîrgu Mureş, Romania , Abstract book, p19
15. **Bakó, L,** Székely, I., „*Challenges for implementations of delay-coded neuromorphic neural networks on embedded digital hardware*", 2nd INCF Congress of Neuroinformatics, Pilsen, Czech Republic, September 6-8, 2009, Abstract book, p132-133.
16. **Bakó, L, „***Real-time clustering of datasets with hardware embedded neuromorphic neural networks*", HiBi 2009 (High performance computational systems Biology) Workshop, COSBi (Microsoft Research - University of Trento Centre for Computational and Systems Biology), Trento, Italy, October 14-16, 2009, Published by IEEE Computer Society, ISBN 978-0-7695-3809-9, pp 13-22, DOI: 10.1109/HiBi.2009.24, **ISI proceedigs**.
17. **László BAKÓ**, Sándor Tihamér BRASSAI, Lajos LOSONCZI, László Ferenc MÁRTON, „Embedded System Based EEG Signal Processing", Proceedings of the 2nd International Conference on Recent Achievements in Mechatronics, Automation, Computer Science and Robotics, MACRo 2010, Sapientia University, Department Of Electrical Engineering, Department Of Mechanical Engineering, May 14-15, 2010, Tîrgu Mures, Romania, ISBN 978-973-1970-39-4, pp. 63-72.
18. Vajda, T., **Bako L.**, Brassai S. T., „Using Dynamic Programming and Neural Networks to Match Human Action", Proceedings of the 11th International Carpathian Control Conference, ICCC 2010, May 26-28, 2010, Eger, Hungary, ISBN 978-963-06-9289-2, pp. 231-234.
19. **László Bakó**, Péter István Fülöp, Advanced Hardware Neural Network Architectures Using Embedded Multi-Core Processors, ICAI 2010 - 8th International Conference on Applied Informatics, Eger, Hungary, January 27-30, 2010.
20. Brassai S.T., Dézsi H., **Bakó L.**, „Navigation system implementation for a quad rotor helicopter", Sixth International PhD, DLA Symposium, University of Pécs, Hungary, Pollack Mihály Faculty of Engineering, 25-26 October, 2010, Edited by Prof. Miklós Iványi, Rotari Press, Komló, Hungary.
21. **Bako L.**, Fulop P. I., „Evolving Advanced Neural Networks on Run-Time Reconfigurable Digital Hardware Platform", Sixth International PhD, DLA Symposium, University of Pécs, Hungary, Pollack Mihály Faculty of Engineering, 25-26 October, 2010, Edited by Prof. Miklós Iványi, Rotari Press, Komló, Hungary.

22. Brassai, S.T., Bakó, L., Márton, L.F., „Parallelization Techniques for BCI Signal Computation", *Proceedings of the 3rd International Conference on Recent Achievements in Mechatronics, Automation, Computer Science and Robotics (MACRo '11)*, Scientia publishing House, Cluj-Napoca, 2011, pp.55-61, ISSN 2247 – 0948.
23. **Bakó L., "**Hardware Implementations of Artificial Neuromorphic Neural Network Systems using Reconfigurable Digital Devices", Poster, 2011 EDAA / ACM SIGDA PhD Forum at Design, Automation & Test in Europe (DATE) in Grenoble, France, March 14-18, 2011.
24. L. Losonczi, **L. Bakó**, S.T. Brassai, L. Katona, L.F. Márton, Portable EEG Signal Measuring and Processing Network, TOBI Workshop III, Bringing BCIs to End-Users: Facing the Challenge: Evaluation, User Perspectives, User Needs, and Ethical Questions, Würzburg, Germany, March 20-22, 2012, pp. 37-38.

C. Contracte de cercetare

1. Sisteme adaptive cu reţele neurale artificiale neuromorfe. Realizări cu dispozitive hardware reconfigurabile, CNCSIS-UEFISCSU (Contract tip TD), ***Director proiect***, 2008-2009
2. Implementarea sistemelor neuro-adaptive cu circuite reconfigurabile. Conducător: dr. ing. Brassai S.T., Institutul Programelor de Cercetare – Fund. Sapientia, *Membru*, 2008-2009
3. Implementarea reţelelor neurale cu codarea decalajelor impulsurilor, bazate pe modele neurale hibride de tip RBF-Spiking cu aplicare pentru probleme de clasificare de date, Fundaţia EuroTrans, ***Director proiect***, 2008
4. Metode inteligente pentru prelucrarea digitală şi interpretarea semnalelor EKG bazate pe analiza Wawelet, Conducător: Prof. dr. ing. Székely Iuliu, Institutul Programelor de Cercetare – Fund. Sapientia, Membru, 2005-2006
5. Optimizarea şi aplicarea reţelelor neuronale artificiale neuromorfe în probleme de control Conducător: Prof. dr. ing. Székely Iuliu, Institutul Programelor de Cercetare – Fund. Sapientia, *Membru*, 2004-2005
6. Simularea şi utilizarea reţelelor neuronale artificiale neuromorfice, Conducător: Prof. dr. ing. Székely Iuliu, Institutul Programelor de Cercetare – Fund. Sapientia, *Membru*, 2003-2004
7. Modelarea şi simularea reţelelor neuronale artificiale neuromorfice, Conducător: Prof. dr. ing. Székely Iuliu, Institutul Programelor de Cercetare – Fund. Sapientia, *Membru*, 2002-2003
8. Obţinerea şi caracterizarea micro-structurală a depunerilor nanocompozite TiAlN în structura multistrat gradient de compoziţie realizate prin pulverizarea reactivă în curent continuu tip magnetron, Conducător: Prof. dr. ing. Dávid László, Institutul Programelor de Cercetare – Fund. Sapientia, *Membru*, 2001-2002.

D. Premii, distincţii.

Premiul ***"The Best Presenter in Information Technology"*** la Conferinţa The 4th International PhD, DLA Symposium, organizat de University of Pécs, Pollack Mihály Faculty of Engineering, Pécs, Ungaria, 20-21 Octombrie 2008.

EDITARE DE VOLUME

Domokos, J., **Bakó, L.**, Szilágyi, L., Forgó, Z. (eds.), *Proceedings of the 3rd International Conference on Recent Achievements in Mechatronics, Automation, Computer Science and Robotics*, Scientia publishing House, Cluj-Napoca, 2011, 378 pag., ISSN 2247 – 0948.

J. Citări

18 citări independente cunoscute.

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