Simona Doboli

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Education

Ph.D., Electrical Engineering — March 2001
University of Cincinnati, Cincinnati, OH
Thesis Advisor: Dr. Ali A. Minai

M.S., Computer Engineering — June 1996
"Politehnica" University of Timisoara, Romania

B.S., Computer Engineering — June 1995
"Politehnica" University of Timisoara, Romania

Teaching Experience

Professor — Sept. 2014 - Present
Computer Science Department
Hosftra University
Hempstead, NY.

Associate Professor — Sept. 2007 - 2014
Computer Science Department
Hosftra University
Hempstead, NY.

Assistant Professor — Sept. 2001 - 2007
Computer Science Department
Hofstra University
Hempstead, NY.

Junior Faculty Member — Sept. 1995 - August 1997
Department of Automation and Industrial Informatics,
"Politehnica" University of Timisoara, Romania.

Research Experience

Research Internship March 2001 - July 2001
Division of Research and Development,
Symbol Technologies, NY.

Summer Neuromorphic Engineering Workshop July 2000
Telluride, CO.

Graduate Research Assistant Sept. 1997 - March 2001
Complex Adaptive Systems Laboratory,
ECECS Department,
University of Cincinnati, OH.

Publications

Journal Papers

1) L.E. Coursey, B.C. Williams, J.B. Kenworthy, P.B. Paulus, S. Doboli: Divergent and Convergent Group Creativity in an Asynchronous Online Environment, *Journal of Creative Behavior*, Published on 12 July 2018 https://doi.org/10.1002/jocb.363
2) H. Li, X. Liu, F Jiao, A. Doboli and S. Doboli, InnovA: A Cognitive Architecture for Computational innovation through robust divergence and its application for analog circuit design, *IEEE Transactions on CAD of Integrated Circuits and Systems*, Vol 37(10), Oct 2018, pp. 1943-1956.
3) A. Doboli, A. Umbarkar, S. Doboli, J. Betz, Modeling Semantic Knowledge Structures for Creative Problem Solving: Six Studies on Expressing Concepts, Categories, Associations, Goals and Context, *Knowledge-based Systems*, Kluwer, published, January 2015.
4) A. Umbarkar, V. Subramanian, A. Doboli, and S. Doboli, Two Experimental Studies on Creative Concept Combinations in Modular Design of Electronic Embedded Systems, *Design Studies*, Elsevier, 35, 2014, pp. 80-109.
5) F. Jiao, S. Montano, C. Ferent, A. Doboli, S. Doboli, Analog Circuit Design Knowledge Mining: Discovering Topological Similarities and Uncovering Design Reasoning Strategies, *IEEE Transactions on CADICS*, Vol. 34, No. 7, July 2015,.
6) Ferent, C., Doboli, A., and Doboli, S. An Axiomatic Model for Concept Structure Description and Its Application to Circuit Design, *Knowledge-based Systems*, Elsevier, Vol. 45, June 2013, pp. 114-133.
7) P. Paulus, D. Levine, V. Brown, A.A. Minai, and S. Doboli. Modeling Ideational Creativity in Groups: Connecting Cognitive, Neural and Computational Approaches. *Small Group Research*, Vol. 41(6), pp. 688-724, December 2010.
8) L.R. Iyer, S. Doboli, A.A. Minai, V.R. Brown, D. S. Levine, P. B. Paulus, Neural dynamics of idea generation and the effects of priming, *Neural Networks*, Vol. 22, Issue 5-6 , pp. 674-686, 2009.
9) H. Zhang, S. Doboli, H. Tang, A. Doboli. Compiled code simulation of analog and mixed-signal systems using piecewise linear modeling of nonlinear parameters. *Integration the VLSI Journal*, Vol. 40, No. 3, pp. 193-209, 2007.
10) S. Kallakuri, A. Doboli, S. Doboli. Applying stochastic modeling to bus arbitration for network-on-chip systems. *Integration the VLSI Journal*, Special issue on VLSI System-On-Chip, Vol. 40, Issue 2, pp. 183-191, February 2007.
11) S. Doboli and A.A. Minai. Network capacity analysis for latent attractor computa-

tion. *Network:Comput. Neural Syst.*, 14:273-302, 2003.

12) S. Doboli, A.A. Minai and P.J. Best. A computational model of the interaction between external and internal cues for the control of hippocampal place cells. *Neurocomputing*, 52-54:371-379, 2003.
13) S. Doboli, A.A. Minai, P.J. Best and A.M. White. An attractor model for hippocampal place cell hysteresis. *Neurocomputing*, 38-40:1185-1191, 2001.
14) S. Doboli, A.A. Minai and P.J. Best. Latent attractors: a model for context-dependent place representations in the hippocampus. *Neural Computation*, 12:1009-1043, 2000.
15) S. Doboli, A.A. Minai and P.J. Best. A comparison of context-dependent hippocampal place codes in 1-layer and 2-layer recurrent networks. *Neurocomputing*, 32-33:353-358, 2000.
16) R.-E. Precup, S. Doboli and S. Preitl. Stability analysis and development of a class of fuzzy control systems. *Engineering Applications of Artificial Intelligence*, 13(3):237-247, 2000.
17) S. Doboli, A.A. Minai and P.J. Best. A latent attractors model of context selection in the dentate gyrus-hilus system. *Neurocomputing*, 26-27:671-676, 1999.

Book Chapters

18) N. Parthasarathy, S. Doboli, and P.B. Paulus: Entrepreneurship. In M. Runco and S. Pritzker (Eds.), it Encyclopedia of Creativity, 2nd Edition. Elsevier, volume 1, pp. 461-467, 2011.
19) S. Doboli, A.A. Minai. Latent attractors: A general paradigm for context-dependent neural computation. In Ke Chen, Lipo Wang (Eds.) *Trends in Neural Computation*, Springer-Verlag, ISBN: 978-3-540-36121-3, pages: 135-170, 2007.
20) S. Doboli, A.A. Minai and P.J. Best. Different Hippocampal Place Cell Maps for Different Environments. In P. Sharp (Ed.) *The Neural Basis of Navigation: Evidence from Single Cell Recording*, Kluwer Academic Publishers, ISBN: 0792375793, pages: 23-41, 2002.

Peer-Reviewed Conference Papers

21) M. Mei, X. Guo, B.C. Williams, Simona Doboli, J.B. Kenworthy, P.B. Paulus, A.A. Minai: Using Semantic Clustering And Autoencoders For Detecting Novelty In Corpora Of Short Texts. In Proceedings of the *International Joint Conference on Neural Networks (IJCNN'2018)*, 2018: 1-8
22) Hensley, A., and Doboli, A., and Mangoubi, R., and Doboli, S.: Generalized Label Propagation. In Proceedings of the *International Joint Conference on Neural Networks*, Ireland, July 2015.
23) Doboli, A., and Doboli, S.: iflows: A Novel Simulation Model for Predicting the Effectiveness of a Research Community. In Proceedings of the *2014 IEEE Symposium Series on Computational Intelligence (SSCI)*, Orlando, Fl, December 2014.
24) Doboli, S., Jacques, M., Minai, A.A., Paulus, P., Korde, R., and Doboli, A.: Modeling the effect of hint timing on the idea generation process. In Proceedings of the *International Joint Conference on Neural Networks*, Dallas, TX, August 2013.
25) Doboli, A. and Doboli S.: Dual-process architecture for reasoning in design innovation problems, In Proceedings of the *International Joint Conference on Neural Networks*, Dallas, TX, August 2013.
26) Doboli, S.: Work in Progress - Computing for middle-school students: The experi-

ence of teaching computers for 7th grade students. In Proceedings of the *Frontiers in Education Conference*, 2011.

27) Currie, E.H., Doboli, S. and Kamberova, G.L. Entrepreneurs- Developing the Next Generation, In Proceedings of the *Frontiers in Education Conference*, 2011.
28) Kamberova, G.K., Pacelli, A., Impagliazzo, J., Currie, E.H., Doboli, S.. Patents and Intellectual Property in Entrepreneurship Education in Computing at Hofstra University. In Proceedings of the *Frontiers in Education Conference*, 2011.
29) Doboli, S. and Brown, V.R. An emergent attractors model for idea generation process. In Proceedings of the 2010 *International Joint Conference on Neural Networks*, pp. 1-8, Barcelona, Spain, 2010.
30) S. Doboli, G.L. Kamberova, J. Impagliazzo, X. Fu and E.H. Currie: A Model of Entrepreneurship Education for Computer Science and Computer Engineering Students. In Proceedings of the *Frontiers in Education Conference* (FIE'2010), October, Washington D.C., 2010.
31) X. Fu, S. Doboli, and J. Impagliazzo: Work-in-Progress: A Sandbox Model for Teaching Entrepreneurship. In Proceedings of the *Frontiers in Education Conference* (FIE'2010), October, Washington D.C., 2010.
32) S. Doboli, V. Brown, A.A Minai: A conceptual neural model of idea generation. In proceedings of the 2009 *International Joint Conference on Neural Networks*, pp. 2777-2783 , Atlanta, Georgia, USA, 2009.
33) A.A Minai, L. Iyer, D. Padur and S. Doboli: A Dynamical Connectionist Model of Idea Generation. In proceedings of the 2009 *International Joint Conference on Neural Networks*, pp. 2777-2783 , Atlanta, Georgia, USA, 2009.
34) L.R. Iyer, A.A. Minai, V.R. Brown, P.B. Paulus and S. Doboli: Effects of relevant and irrelevant primes on idea generation : A computational model. In Proceedings of the 2009 International Joint Conference on Neural Networks, Atlanta, GA, 2009.
35) Ali A. Minai, Laxmi R. Iyer, Divyachapan Padur, Simona Doboli and Vincent R. Brown: A Graded Attractors: Configuring Context-Dependent Workspaces for Ideation, Proceedings of the *AAAI Symposium on Brain-Inspired Cognitive Architectures (BICA'09)*, Arlington, VA, November 2009.
36) A. Doboli, S. Doboli and E. Currie, "Preparing Computer Engineers for a Global Economy: A Study on Effective Collaboration Practices in Global Student Teams", In Proceedings of the *Frontiers in Education Conference* (FIE'2009), Austin, TX, 2009.
37) W. Tang, S. Doboli, L. Gafney and S. Lowes, Project EXCE2L: A work in progress to revitalize undergraduate computing curriculum through entrepreneurship, In Proceedings of the *2009 International Conference on Frontiers in Education: Computer Science and Computer Engineering*, Las Vegas, NV, July 13-16, 2009.
38) A. Doboli, S. Doboli, E. H. Currie. Visual Embedded System Programming Has Arrived! In Proceedings of the 38th ASEE/IEEE *Frontiers in Education Conference*, Saratoga Springs, NY, October 22 -25, 2008.
39) L.R. Iyer, A.A. Minai, S. Doboli, and V.R. Brown. Modeling exploration and exploitation in creative idea generation. Proceedings of the *19th Midwest Artificial Intelligence and Cognitive Science Conference*, Cincinnati, OH, 2008.
40) S. Kallakuri, A. Doboli, S. Doboli, D. Pescaru and Daniel Curiac: SoC Design Point Selection for Dynamic Adaptation under Continuously Varying Throughput Constraints In Proceedings of *NASA/ESA Conference on Adaptive Hardware and Systems*, August 2007.

41) L. Iyer and A.A. Minai, S. Doboli, V. Brown. Modularity and Self-Organized Functional Architectures in the Brain. In Proceedings of the *7th International Conference on Complex Systems* (ICCS'2007), Boston, MA. 2007.
42) S. Luryi, W. Tang, N. Lifshitz, Y. Shamash, G. Wolf, S. Doboli, J.A. Betz, P.Maritato Entrepreneurship in Engineering Education. In Proceedings of the *Frontier in Education Conference*, Milwaukee, Wisconsin, October 10-13, 2007.
43) S. Doboli, A.A. Minai and V. Brown. Adaptive Dynamic Modularity in a Connectionist Model of Context-Dependent Idea Generation, In Proceedings of the *International Joint Conference of Neural Networks* (IJCNN'2007), August 2007, pages: 2183-2188.
44) N.A. George, A.A. Minai, S. Doboli. Self-organized inference of spatial structure in randomly deployed sensor networks. In Proceedings of the *6th International Conference on Complex Systems* (ICCS'2006), Boston, MA, 2006.
45) N. Thepayasuwan, S. Kallakuri, S. Doboli, A. Doboli. Communication subsystem synthesis and analysis tool using bus architecture generation and stochastic arbitration policies. *IEEE International Symposium on Circuits and System* (ISCAS'2005), Kobe, Japan, 23-26 May 2005 Page(s):1044 - 1047 Vol. 2, 2005.
46) S. Doboli and A.A. Minai. Using latent attractors to discern temporal order. In Proceedings of the *International Joint Conference on Neural Networks* (IJCNN'2004), Budapest, Hungary, 25-29 July 2004 Page(s):1469 - 1474 vol.2, 2004.
47) R. M. Bateman and S. Doboli. Reinforcement learning algorithm using neural networks for playing Othello. In Proceedings of the *Conference on Computer Games: Design, AI and Education* (CGAIDE'2004), Microsoft Academic Campus, Reading, UK, Pages: 71-74, 2004.
48) S. Kallakuri, A. Doboli and S. Doboli. Stochastic modeling based environment for synthesis and comparison of bus arbitration policies. In Proceedings of the *International Symposium on VLSI* (ISVLSI'2004), 19-20 Feb. 2004 Page(s):199 - 204, 2004.
49) Y. Weng, S. Kallakuri, A. Liang, A. Doboli, S. Hong, T. Robertazzi and S. Doboli. Dynamic architecture adaptation to improve scalability of sensor netwokorks: A case study for a smart sensor for face recognition. In Proceedings of the *Real-Time Systems Symposium* (Work in Progress Section), (RTSS'20004), Lisbon, Portugal, 2004.
50) S. Doboli, G. Gothoskar and A. Doboli. Extraction of Piecewise-Linear Analog Circuit Models from Trained Neural Networks using Hidden Neuron Clustering. In Proceedings of *DATE'2003*, Munich, Germany, Page(s):1098 - 1099, 2003.
51) S. Doboli and A.A. Minai. Latent attractor selection for variable length episodic context stimuli with distractors. In Proceedings of *IJCNN'2003*, Portland, USA, 20-24 July 2003 Page(s):1643 - 1648 vol.3, 2003.
52) S. Doboli, G. Gothoskar, A. Doboli. Piecewise-linear modeling of analog circuits using trained feed-forward neural networks and adaptive clustering of hidden neurons. In Proceedings of *IJCNN'2003*, Portland, USA, 20-24 July 2003 Page(s):1126 - 1131 vol.2, 2003.
53) S. Kallakuri, A. Doboli and S. Doboli. Applying stochastic modeling to bus arbitration for network-on-chip systems. In Proceedings of *International Conference on VLSI*, Las Vegas, USA, 2003.
54) S. Doboli, G. Gothoskar and A. Doboli. Modeling of Analog Circuits based on Model Extraction from Trained Neural Networks. In Proceedings of *IEEE Inter-*

national Workshop on Behavioral Modeling and Simulation (BMAS'2002), Santa Rosa, USA, Page(s):41 -46, 6-8 Oct. 2002.

55) S. Doboli, A.A. Minai. Latent attractor selection in the presence of irrelevant stimuli. In Proceedings of the *World Congress on Computational Intelligence* (WCCI'2002), Hawaii, USA, 12-17, Page(s):124 - 129, May 2002.
56) S. Doboli, A.A. Minai. A computational model of the interaction between external and internal cues for the control of hippocampal place cells. In Proceedings of the *Computational Neuroscience Meeting* (CNS'2002), Chicago, USA, July 2002.
57) S. Doboli, A.A. Minai. Progressive attractor selection in latent attractor networks. In Proceedings of the *International Joint Conference on Neural Nerworks* (IJCNN'2001), Washington D.C., USA, 15-19 July 2001 Page(s):308 - 313 vol.1, July 2001.
58) S. Doboli, A.A. Minai, P.J. Best and A.M. White. An attractor model for hippocampal place cell hysteresis. In Proceedings of the *Computational Neuroscience Meeting* (CNS'2000), Bruges, Belgium, 2000.
59) S. Doboli and A.A. Minai. Network capacity for latent attractor computation. In Proceedings of the *International Joint Conference on Neural Networks* (IJCNN'2000), Como, Italy, pp. 222-228.10, 2000.
60) S. Doboli and A.A. Minai. Generating smooth context-dependent neural representations. In Proceedings of the *International Joint Conference of Neural Networks* (IJCNN'1999), Washington D.C., USA, 1999.
61) S. Doboli and R.-E. Precup. The application of a stability analysis method to fuzzy control systems. In Proceedings of The 7-th *World Congress of International Fuzzy Systems Association* (IFSA'97), Prague, Czech Republic, 3:452-457, 1997.
62) S. Doboli and R.-E. Precup. Stability analysis and design of a class of fuzzy control systems. In Proceedings of Fourth *IFAC Conf. on System Structure and Control* - SSC'97, Bucharest, Romania, pp. 361-366, 1997.

Abstracts

63) S. Doboli, A. Henshley, X. Lin, F. Jiao, and A. Doboli, New measures for evaluating creativity in scientific publications, presented at the *Computational Intelligence Conference*, MIT, Boston, June 10-12, 2014.
64) D. E. Weissman, S. Doboli, and A. Esposito, Estimation of sea surface rainrate from SeaWinds data using neural network methods, *International Ocean Vector Winds Science Team Meeting*, 2-4 June 2014, Brest, France.
65) S. Doboli: A dynamic cognitive model of novel conceptual combinations, In Proceedings of the *Thirteen Neural computation and Psychology Workshop*, (NCPW13), San Sebastian, Spain, July 2011.
66) S. Doboli and V. R. Brown: A stochastic model of the role of semantic networks in individual and group idea generation, Presented at *IJCNN'2011*, San Jose, California, 2011.
67) S. Doboli, L. Iyer, A.A. Minai, V.R. Brown, and C. Claxton: Dynamics of search in a neural model of idea generation. In Proceedings of the *12th International Conference on Cognitive and Neural Systems*, Boston, 2008.
68) V. Brown and S. Doboli. A Neural network simulation of interactive group brainstorming. *Eighteenth Annual Convention of the Association for Psychological Science*, New York, May 2006.
69) S. Doboli and V. Brown. A neural network model of creative idea generation in groups. In Proceedings of the *Ninth International Conference on Cognitive and*

Neural Systems, Boston, May 2005.

70) S. Doboli, A.A. Minai and P.J. Best. A model for non-linear computational aspects in hippocampal place representations. In Proceedings of *Fourth International Conference on Cognitive and Neural Systems, Boston*, 2000.
71) B.B. Rettenmaier, A.M. White, S. Doboli, A.A. Minai and P.J. Best. Place fields of hippocampal pyramidal cells in rats show hysteresis. *Soc. Neurosci. Abs.*, Vol.2, 120-121, 1999.
72) S. Doboli, A.A. Minai and P.J. Best. Context-dependent place representations in the hippocampus. In Proceedings of *Third Conference on Cognitive and Neural Systems*, Boston, 1999.

Panels/Symposiums

73) P. Paulus, J. Kenworthy, A.A. Minai, A. Doboli, and S. Doboli: A Study of the Relationship Between Individual and Community Level Creativity, Symposium on Creativity in Networks: A Multi-disciplinary Approach. Presented at the *Association for Psychological Science, 27th Annual Convention*, NYC, May 2015.
74) P. Erdi, R. Kozma (chairs), Doboli, S., Haibo, H., Ritter, F., Thagard, P., and Weng, J.: Panel on teaching cognitive science and computational intelligence. Panel Session at *International Joint Conference on Neural Networks*, Dallas, Texas, 2013.
75) P. Erdi and S. Doboli (organizers): Undergraduate interdisciplinary education in cognitive and neural computation: What, how and why?, Panel Session at *International Joint Conference on Neural Networks*, San Jose, California, 2011.
76) S. Doboli, W. Tang, R. Ramnath, J. Impagliazzo, T. VanEpps, A. Agarwal, R. Romero and E. H. Currie: Panel - Models of Entrepreneurship Education and its Role in Increasing Creativity, Innovation and Leadership in Computer Science and Engineering Students. In Proceedings of *Frontiers in Education Conference* (FIE'2010), October, Washington D.C., 2010.

Invited talks

77) S. Doboli: Cognitive science and idea generation. Invited talk at *NSF Workshop on Cognitive Science* at *International Joint Conference on Neural Networks*, Dallas, Texas, 2013.

Professional Activities

- Associate Editor for the Journal of Cognitive Systems Research, since 2014.
- Tutorial chair and program committee member for the *International Joint Conference on Neural Networks* (IJCNN'2019), Budapest, 2019
- Workshop chair and program committee member for the *International Joint Conference on Neural Networks* (IJCNN'2013), Dallas, Texas, 2013.
- Member in the subcommittee for Education/Curriculum of the *Computational Intelligence Society of IEEE*, since Spring 2012.
- Program Committee Member for the *International Conference on Artificial Neural Networks*, ICANN'2012.
- Program Committee Member for the *Brain Inspired Cognitive Architectures conference*, BICA'2011, BICA'2012.
- Program Committee Member for the *Midwest Artificial Intelligence and Cognitive Science Conference*, MAICS'2011, MAICS'2012.
- Panel chair and program committee member for the *International Joint Conference on Neural Networks* (IJCNN'2011), San Jose, California, 2011.
- Co-organizer of Panel on interdisciplinary education in cognitive and neural computation at IJCNN'2011, San Jose, California, 2011.
- Organizer of an eight people panel on entrepreneurship education at *Frontiers in Education Conference*, Washington, D.C., 2010.
- Co-chair "Cognitive Mechanisms and Modeling 1" session at *International Joint Conference on Neural Networks*, 2009.
- Associate Editor for IEEE Transactions on Neural Networks, (2005 - 2007).
- Reviewer for IEEE Transactions on Neural Networks.
- Reviewer for Cognitive Systems Research Journal.
- Reviewer for IEEE Transactions on Circuits and Systems.
- Reviewer for Neural Networks.
- Reviewer for Hippocampus.
- Reviewer for the International Joint Conference on Neural Networks (IJCNN).
- Reviewer for the Cognitive Science Conference.
- Reviewer for Journal of Educational Resources in Computing (JERIC).

Grants

1) co-PI on NSF: NSF-1247971 (09/15,2012 - 08/31/2015): *INSPIRE: The hunting of the Spark: A Systematic Study of Natural Creativity in Human Networks*,(Hofstra subcontract budget $87,209, total budget $999,762).
2) PI on NSF-0855883 Major Collaborative Grant (08/15/2009 - 08/14/2012): *Major Collaborative Proposal: CreativeIT: Understanding the Creative Design Process: A Novel Cognitive Model based on Behavioral Experiments in Circuit Design and Architecture*, (Hofstra budget $87K, total budget $750K).
3) PI on NSF-0829641 Collaborative Grant (08/31/2008 - 08/20/2011): *Collaborative Research: CPATH-TI: Project ExCE2L (Excellence in Computer Education with Entrepreneurship and Leadership Skills*, (Hofstra Budget $364K, total budget $750K).
4) PI on NSF-0729470 Collaborative Grant (10/01/2007 - 09/30/2011): *Collaborative Proposal: DHB: Dynamics of idea generation in individual and group brainstorming: a multi-disciplinary approach using network models and behavioral experiments* (Hofstra budget $171K, total budget $680K).

Professional Organizations

- Member of IEEE, IEEE Computational Intelligence Society.

Awards

- Recipient of the 2001 Best PhD thesis Award, awarded by the Department of Electrical and Computer Engineering and Computer Science, University of Cincinnati, OH.
- Recipient of 1999 and 2000 Summer Student Fellowship, awarded by University of Cincinnati Research Council, OH.
- University Graduate Scholarship, University of Cincinnati, Sept. 1997 - March 2001.
- Graduated in 1995 with *Diploma of Merit* from "Politehnica" University of Timisoara, Romania.
- Ranked first in class in all 5 years of college (out of 100 students).
- *Scholarship of Merit*, 1990-1995, "Politehnica" University of Timisoara, Romania (awarded to top 5 students each year).