

Cris Koutsougeras

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Education:

- Ph.D., Computer Science**, August 1988, Case Western Reserve University, Cleveland, Ohio
- Dissertation on neural network learning algorithms and hardware implementation architectures
- M.S., Computer Engineering**, December 1984, University of Cincinnati, Cincinnati, Ohio
- Thesis on Data Flow machine architectures
- B.S., Electrical Engineering** (5 year prog.), June 1983, National Technical University of Athens – Greece
- Thesis on graphs isometrically embeddable in hypercubes

Experience (and highlights of accomplishments) :

Professor of Computer Science, Computer Science Dept. Also serving the computer engineering concentration of the Industrial/Engineering Technology Dept., Southeastern LA University, August 2011- currently.

Department Head, Computer Science and Industrial Technology Dpt., Southeastern LA University, August 2006 – August 2011.

- Established new program in Engineering Technology with concentrations in Computer ET, Energy ET, Mechanical ET, Industrial ET, Construction ET
- Accreditation reviews by ABET (Computer Science program; 2006, 2008; OSHE 2010) and NAIT (ATMAE) (Industrial Technology program; 2008)
- Established 2+2 articulation agreements with technical colleges (Baton Rouge Community College, Delgado Community College)
- Program assessment methods (Computer Science, Industrial Technology, Engineering Technology, Occupational-Safety-Health-Environment)
- External advisory board with subcommittees for all four programs of the department
- Initiated EARLY-START program for CS and Ind. Tech. (high school coordinated offerings of selected courses for dual credit at Southeastern's Computer Science and Industrial Technology programs).

Faculty, Electrical Engineering & Computer Science Department, Tulane University, 1997 – 2006

- Leader of Tulane's DARPA Grand Challenge team and development for Team Gray's KAT5 (4th robot out of the 5 that finished the 2005 Grand Challenge competition)
- NASA summer faculty, Stennis Space Center, 2005
- Graduate program coordinator, EECS department
- Founder of the Center for Automation and Autonomous Systems at the School of Engineering

Faculty, Computer Science Department, Tulane University, 1988 – 1997

- NSF Young Investigator award
- IEEE awards

Instructor of Electrical & Computer Engineering, Cleveland State University, 1988

Hands-on Experience:

- AWS Cloud Practitioner certification, June 2019.
- IPR-2013-00424 expert research and declaration 2014
- Participated in the development of the completely autonomous car robot KAT-5; an intelligent robot car that navigates without any human guidance on unknown/unrehearsed terrain (search DARPA Grand Challenge 2005)
- Supervised more than 50 graduate and undergraduate projects involving electro-mechanical apparatus, microcontrollers, sensors, and computer interfacing.
- Developed more than 50 commercial websites involving server-side and client-side programming, including server-side Databases and dynamic content management.
- Led a Business Hackathon team (with M. Saadeh) which won in three categories, Xavier University, New Orleans, March 2017.
- Led a team (with M. Saadeh and M. Zeidan) to a business *Start Up Weekend* at Loyola University of New Orleans 10/16-10/18, 2015. Second place winners, developed from scratch a blocks-programmed wireless robot toy for kids, marketing and business proposal. <http://csit.selu.edu/~csit/goblox>
- Developed NETSAL (with Troy Kammerdiener and Warren Duclos) a facility to support Information Technology courses at Southeastern and Delgado Community College. The facility was funded by a post-Katrina program of the LA Board of Regents; it offered remote server access to support courses at both institutions and facilitated a 2+2 articulation pathway.
- Funded by NSF, DoD, NASA, EPSCOR, and LA Board of Regents.

Expertise:

Past work, research, publications, and projects span the following fields: Renewable Energy harvesting systems, Robotics, Artificial Intelligence Systems (particularly sub-symbolic; Neural Nets, Machine Learning, Pattern Recognition/Classification), Hardware and software design for computer interfacing, Internet programming, Information Technology Tools (Web).

Publications

Refereed Journals:

Cris Koutsougeras, Mohammad Saadeh and Ahmad Fayed, "A Framework and Method for Analysis of Feed-Forward Industrial and Manufacturing Lines", *Journal of Intelligent Manufacturing and Special Equipment*, Type: Research Article, ISSN: 2633-6596, DOI: <https://doi.org/10.1108/JIMSE-06-2021-0031>

Alexis Daniels, Cris Koutsougeras, "Geographic Information Systems: A Survey", *Computer Reviews Journal*, 34-42, Vol. 4 (2019), 08-30-2019. <https://purkh.com/index.php/tocomp/article/view/393>

C. Koutsougeras, J. Ma, H. Luo, "Study of a Vertical Axis Wind Turbine with Deflection Panels: COMSOL 2D Simulation of a Single Panel", *Journal of Advanced Research in Modeling and Simulation*, Volume 1, Issue 1&2 - 2018, Pg. No. 16-23. <http://adrjournalshouse.com/index.php/Modelling-Simulation-operations/article/view/39/399>

Ma J, and C. Koutsougeras, "Effects of Design Parameters on the Fluid Flow and the Efficiency of Single Ended Evacuated Tubular Solar Thermal Collectors via FEM Modelling and Experimentation" *Engineering Journal*, DOI:10.4186/ej.2015.19.5.69, October 2015, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjZ3qu7xejKAhVL7GMKHfSJBUEQFggdMAA&url=http%3A%2F%2Fengj.org%2Findex.php%2Ffej%2Farticle%2Fview%2F793%2F422&usq=AFQjCNFUrQb8RTmpON-HHgbpYZawhlGlkw&sig2=CDBn_BlpTsyTsZ-9S-lycw

- C. Martinez and C. Koutsougeras, "A Vertical Axis Wind Turbine And Its Control", American Research Institute's Journal of Engineering and Architecture, March 2014, Vol. 2, No. 1, pp. 17-25
- C. Koutsougeras, Y. Liu, R. Zheng, "Event-driven Sensor Deployment Using Self Organizing Maps", Intl. Journal of Sensor Networks (IJSNet) - Special Issue on: "Coverage Problems in Sensor Networks", Vol. 3, No. 3, 2008
- P. Trepagnier, J. Nagel, P. Kinney, C. Koutsougeras, M. Dooner, "KAT-5: Robust systems for autonomous vehicle navigation in challenging and unknown terrain", Intl Journal of Field Robotics, Vol 23, No 8, pp: 509-526, Wiley, 2006; also in "The 2005 DARPA Grand Challenge" Book Series: Springer Tracts in Advanced Robotics, DOI 10.1007/978-3-540-73429-1_3, Pages 103-128, ISBN 978-3-540-73428-4 Publisher: Springer
- J. F. Vassilopoulos, C. Koutsougeras, and A. Hernandez-Acquire, "On the problem of training the Coulomb Energy Network", Intl. Journal of Artificial Intelligence Tools, Vol 11, No 4, pp 475-498, Dec. 2002
- Arturo Hernandez-Aguirre, C. Koutsougeras, and B. Buckles, "Sample complexity for function learning tasks through linear neural networks", Intl. Journal of Artificial Intelligence Tools, Vol 11, No 4, pp 499-512, Dec. 2002
- N. G. Bourbakis, S. Mertoguno, and C. Koutsougeras, "A knowledge based expert system for automatic visual VLSI reverse engineering", IEEE Trans. Systems, Man, and Cybernetics, V32, No3, pp 428-436, May 2002
- C. Koutsougeras, N. G. Bourbakis, and V. Gallardo, "Reverse engineering of real PCB level design using VERILOG HDL", Intl. Journal of Engineering Intelligent Systems, V10, No 2, pp 63-68, June 2002
- N. G. Bourbakis, C. Koutsougeras, and A. Jameel, "Handwritten character recognition using low resolutions", Engineering Applications of Artificial Intelligence, vol.10, no.10, 1998
- Srikanth, R., C. Koutsougeras, and R. George, "Hybrid Charge Clustering Network: a heterogeneous neural network model", Neural, Parallel & Scientific Computations Journal, vol. 2, pp. 235-244, 1994.
- Israel P., and C. Koutsougeras, "A Hybrid Electro-Optical Architecture for Classification Trees and Associative Memory Mechanisms", International Journal of Tools for Artificial Intelligence, Vol. 2, No. 3, 1993.
- Gumahad, A.T., N.G. Bourbakis, and C. Koutsougeras, "Recognition of typed characters using a 2-D FT for a letter driven text reading system", International Journal on Engineering Applications of AI, Vol. 6, No. 5, April 1993.
- Koutsougeras, C., and P. Israel, "A Method for Parallel Search Under Higher Order Constraints", International Journal of Pattern Recognition, Vol. 7, No. 3, Sept. 1993.
- Georgiou, G., and C. Koutsougeras, "Complex Domain Backpropagation", in IEEE Trans. on Circuits and Systems Part II: Analog and Digital Signal Processing, Vol. 39, no. 5:330-334, May 1992.
- Koutsougeras, C., and G. Papadourakis, "Coupling Supervised and Unsupervised Techniques in Training Feed-Forward Nets", International Journal of Artificial Intelligence Tools, Vol. 1, no. 1, March 1992.
- Koutsougeras, C., G. Georgiou and C. Papachristou, "A Feed Forward Classifier Model: Multiple Classes, Confidence Output Values, and Implementation", International Journal of Pattern Recognition and AI (IJPRAI), Vol.6, No. 4, 1992.
- Israel, P., and C. Koutsougeras, "Associative Recall Based on Abstract Object Descriptions Learned from Observation: The CBM Neural Net Model", International Journal of Pattern Recognition and AI, Vol. 4, No. 2, June 1990.

Other Archives:

Koutsougeras, C., "Unsupervised Composite Networks", in the Handbook of Neural Computation, published jointly by Institute of Physics Publishing and Oxford University Press, p.p. C2.3:1-C2.3:12, Oct. 1996.

Koutsougeras, C., and N. Bourbakis, "Artificial Neural and Neuromorphic Models", chapter 17 in *Tools for AI*, World Scientific, Singapore/New Jersey/London/Hong Kong, 1992.

Conference papers (peer reviews):

Alexis Daniels and Cris Koutsougeras, "Predicting Water Quality Parameters in Lake Pontchartrain using Machine Learning", Intl. Conf. on Knowledge Management Systems ICKMS-2021, May 28-31, 2021

A comparison on K-Nearest Neighbors, Decision Trees, and Neural Networks to Predict Water Quality", ICKMS 2021, paper# MS21-602.

J. Ma, C. Koutsougeras, H. Luo, "Efficiency of a Vertical Axis Wind Turbine (VAWT) with Airfoil Pitch Control", COMSOL Conference 2016, Boston, October (2016)

H.H. Lee, C. Koutsougeras, "A Leader-Following Formation Control of a Group of Mixed-Type Mobile Robots", Proceedings of 2016 International Mechanical Engineering Congress and Exposition IMECE2016 November 11-17, 2016, Phoenix, Arizona, U.S.A.

J. Ma and C. Koutsougeras "Evaluation of Design Efficiency via COMSOL Simulations" EPSCoR Industry-Academia Workshop on Advanced Materials and Manufacturing, New Orleans, November, 2014

C. Koutsougeras and J. Ma, "Efficiency Studies of Various Airfoils for Energy Harvesting", BOR Fourth Annual Industry-Academia Collaborative Workshop "Next Generation Energy Technology", Baton Rouge, April 9, 2013

P. McDowell, and C. Koutsougeras, "Graph Memory Development In A Robot Control Architecture", Proceedings CCSC:SC 2009

J. Nagel, P. Trepagnier, C. Koutsougeras, P. Kinney, M. Dooner, "The Culebra Algorithm for Path Planning and Obstacle Avoidance in Kat-5", ICTAI '06: Proceedings of the 18th IEEE International Conference on Tools with Artificial Intelligence, November 2006

Hernandez-Aguirre, Arturo and Cris Koutsougeras and Bill P. Buckles, "Sample Complexity for Function Learning Tasks through Linear Neural Networks", accepted for the Proceedings of Mexican International Conference on AI, MICAI-2002 Merida, Mexico. April 22-26, 2002

Hernandez-Aguirre Arturo, Koutsougeras Cris, and Buckles P. Bill, "On Model Selection in SLT and Linear Basis Functions", Proceedings of the International Joint Conference on Neural Networks (ICNN-IJCNN), Washington, D.C. 1999

R. Alba-Flores, C. Koutsougeras, B. Buckles, and S. Amer, "Metadata for a Content-Based Prototype", Third IEEE Meta-Data Conference, Bethesda, Maryland, April 1999.

J. Zhang, X. Yuan, Z. Zeng, B. Buckles, C. Koutsougeras, S. Amer, "Nicheing in an ES/EP Context", CEC'99, Washington, DC, July 6-9, 1999.

Bill P. Buckles, Cris Koutsougeras, Saud Amer, Jer-Yee Chuang, and Xiao Yuan, "Image Decomposition Using Evolutionary Strategies," Proc. JCIS'98, Vol. II, Second Intern. Workshop on Evolutionary Algorithms, Research Triangle Park, NC, 1998, pp. 395-398.

J.F. Vassilopoulos, and Cris Koutsougeras "Refinement training schemes for the Coulomb energy network", Internat. conf. on Tools with AI, Toulouse, France, November 1996.

D. Roberts, C. Koutsougeras, R. Nudo, C. Cusick, "Modeling Sensory Representations in Brain: New Methods for Studying Functional Architecture Reveal Unique Spatial Patterns", Proc. 1st Intl. Symposium on Intelligence in Neural and Biological Systems, Washington, DC, May 1995.

N. G. Bourbakis, C. Koutsougeras and A. Jameel, "Handwriting recognition using a reduced character method and neural nets", SPIE Intl. Electronic Imaging Science & Technology Symposium, vol. VI, pp.592-601, San Jose, CA., February 5-10, 1995.

C. Koutsougeras, "Principal Components and Neural Nets", in proceedings World Congress on Neural Networks, Vol. 3, pp. 307-311, June 1994.

A. Jameel and C. Koutsougeras, "Experiments with Kohonen's Learning Vector Quantization in Handwritten Character Recognition Systems", Proceedings of the 37th Midwestern Symposium on Circuits and Systems, V1. pp 573-576 August 1994.

C. Koutsougeras and A. Jameel, Experiments with various Neural Architectures for Handwritten Character Recognition, Proceedings of the 37th Midwestern Symposium on Circuits and Systems, V1. pp 573-576 August 1994.

Koutsougeras C., and R. Srikanth, "Data transformation for learning in feed-forward neural nets", Proc. Internat. conf. on Tools with AI, pp 22-29, Boston, MA. November 1993.

Jameel, A. and C. Koutsougeras, "On features used for handwritten character recognition in a neural network environment", Proc. Internat. conf. on Tools for AI, pp 280-284 Boston, MA. November 1993.

Srikanth, R., C. Koutsougeras, and R. George, "Hybrid Kohonen Network", Proceedings 2nd International Conference on Fuzzy Theory and Technology, pp. 121-123, October 1993, Durham, NC.

Srikanth, R., F. E. Petry, and C. Koutsougeras, "Fuzzy Elastic Clustering", Proceedings International IEEE Conference on Fuzzy Systems, FUZZ-IEEE'93, March 1993, pp. 1179-1182, San Francisco, CA.

Georgiou, G., and C. Koutsougeras, "Embedding Discriminant Directions in Backpropagation", in Proceedings of the IEEE Southeastcon '92, Birmingham AL, April 1992, vol. 2, pp. 816-818.

Georgiou, G., and C. Koutsougeras, "Embedding Domain Information in Backpropagation", in Proceedings of SPIE (International Society for Optical Engineering) Conference on Adaptive and Learning Systems, Orlando, Florida, 1992.

Srikanth, R., and C. Koutsougeras, "Pattern Classification Using the Hybrid Coulomb Energy Network", Proceedings of the Fifth Annual Conference on Neural Nets and parallel distributed processing, pp 159-166, April 1992, Fort Wayne, Indiana.

Koutsougeras, C., and G. Papadourakis, "A Method for Training a Feed-Forward Neural Net Model While Targeting Reduced Nonlinearity", Proceedings ICTAI '91 international conference, San Jose, CA, Nov. 1991.

- Israel, P., and C. Koutsougeras, "Associative Memory with Increased Storage Capacity and Retrieval Capability", 2nd Government Neural Network Applications Workshop, September 1991.
- Koutsougeras, C., G. Georgiou and C. Papachristou, "Extending Athena : Multiple Classes and Confidence Output Values", Proc. Tools for Artificial Intelligence, International Conference, Washington D.C. Nov. 1990.
- Israel, P., and C. Koutsougeras, "An Annealing Approach to Associative Recall in the CBM Model", International Joint Conference on Neural Networks (IJCNN-90), San Diego, Ca, June 1990.
- Koutsougeras, C., H. Barad and A. Martinez, "Neural Networks in Scene Analysis", Invited paper, International Society for Optical Engineering (SPIE) Conference, Orlando FL. April 1990.
- Srikanth, R., C. Koutsougeras, F. Dandashi and M. Bringman, "Test Cases : Emergent Generalizations in the Athena and the Rumelhart's Neural Net Models", Proc. of IEEE-Southeastcon, New Orleans LA, April 1990.
- Abrahamson, A., C. Koutsougeras and C. Papachristou, "Handwritten Character Recognition with the Athena Model", Proc. of IEEE-Southeastcon, New Orleans LA, April 1990.
- Israel, P., and C. Koutsougeras, "Associative Recall Based on Abstract Object Descriptions Learned from Observation: The CBM Neural Net Model", in Proceedings of the Tools for Artificial Intelligence International Conference, Washington D.C. Nov. 1989.
- Koutsougeras, C. and C. Papachristou, "A Hybrid Architecture for the Implementation of the Athena Neural Network Model", NASA Conference on Space Telerobotics, Pasadena, Jan. 1989.
- Israel, P., C. Koutsougeras and C.A. Papachristou, "The Development of an Associative Memory Model Based on a Classifier", in Proceedings of the International Joint Conference on Neural Networks, (IJCNN '89), June, 1989.
- R. George, B. J. Geraci, R. Srikanth, and C. Koutsougeras, "A Methodical Study of the Rumelhart Model", Proc. of 5th IASTED International Conference, pp. 31-35, Honolulu, Hawaii, August 1989.
- Koutsougeras, C. and C.A. Papachristou, "Training of A Neural Network Model for Pattern Classification Based on an Entropy Measure", in Proceedings of the IEEE International Conference on Neural Networks (ICNN '88), IEEE, July 1988.
- Koutsougeras, C. and C.A. Papachristou, "A Neural Network Model for Propositional Logic Functions", Computational Intelligence International Conference, Elsevier-North Holland, October 1988.
- Koutsougeras, C. and C.A. Papachristou, "Learning Discrete Mappings: Athena's Approach", in Proceedings of the IEEE International Conference on Languages for Automation (LFA '88), August 1988.
- Koutsougeras, C., and C.A. Papachristou, "Data Flow Graph Partitioning to Reduce Communication Cost", 19th ACM/IEEE Microprogramming Conference (Micro-19), October 1986.

Select Service

- Real-World-Ready committee, 2015-2018
- Internships coordinator for Engineering Technology, 2012-2018
- Southeastern University Experiential Learning Team member, 2015-2016
- Expert witness, patent IPR.
- Program articulation and resource sharing with Delgado community college.

- Louisiana Region coordinator for the **Future City®** competition for middle schools, 2011-2014. Co-coordinator with Dr. Brenda Nixon of LSU 2015-2019.
- Member of the faculty of the Neuroscience Program hosted by the Tulane Medical School (elected November 1994) until June 2000.
- Founder of the Center for Automation and Autonomous Complex Systems (CA²CS) at Tulane University
- Served as member of the Editorial Board, and as associate editor of the International Journal on Artificial Intelligence Tools, published by World Scientific.
- Served as organizer, program chairman, and committees for the IEEE International Conference on Tools for Artificial Intelligence (ICTAI) from 1989-2000. Served as organizer for the STOC-91 (ACM - Theory of Computation) international conference on Theory of Computation); Program Co-Chair for the IEEE Symposium on Information and Intelligent Agents (IIA), and Program Committee of the 1999 International Conference on Information, Intelligence, and Systems, Washington DC.
- IEEE certificate awards for service, 1992 & 1995.
- Member of the Standards Committee of the IEEE Council for Neural Nets, 1989-1991.
- Reviewer for International Conferences; Reviewer for Intl. Journals; Reviewer for NSF proposals; Book reviews.

Courses Taught

<ul style="list-style-type: none"> ● Web Servers and Internet Programming * ● Internet of Things (IoT) *# ● Microcontrollers (Arduino, Raspberry, etc) and Sensors *# ● Industrial Applications of Data Science * ● Web Design and Interfacing * ● Artificial Intelligence * ● Computer Architecture * ● Theory of Computation * ● Enterprise Software Design * ● Programming Languages * ● Numerical Analysis * ● Neural Networks * ● Computer Engineering/Engineering Technology Capstone Projects. 	<ul style="list-style-type: none"> ● Intro. Control Systems # ● Data Structures * ● Digital Logic Design # * ● Electronic Circuits \$ ● Computer Interfacing *# \$ ● Photovoltaics # ● Signal Analysis \$ ● Computer Engineering Lab *# ● Electrical Engineering Lab *\$ ● Introduction to Engineering Technology # ● Systems Design with Microprocessors # ● Integrated Technologies for Enterprise Systems *#
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* Computer Science

Engineering Technology

\$ Electrical Engineering